

Ways of spectating: Unravelling spectator participation in Kinect play

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ABSTRACT

We explore spectating on video game play as an interactional and participatory activity. Drawing on a corpus of video recordings capturing ‘naturally occurring’ Kinect gaming within home settings, we detail how the analytic ‘work’ of spectating is interactionally accomplished as a matter of collaborative action with players and engagement in the game. We examine: spectators supporting players with continuous ‘scaffolding’; spectators critiquing player technique during and between moments of play; spectators recognising and complimenting competent player conduct; and spectators reflecting on prior play to build instructions for the player. From this we draw out a number of points that shift the conversation in HCI about ‘the spectator’ towards understanding and designing for *spectating* as an interactional activity; that is, sequentially ordered and temporally coordinated. We also discuss bodily conduct and the particular ways of ‘seeing’ involved in spectating, and conclude with remarks on conceptual and design implications for HCI.

Author Keywords

Spectatorship; spectating; Kinect; video gaming; participation; ethnomethodology; conversation analysis.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

Spectator experience, and its relevance for the design of interaction with devices and systems, has been of interest to HCI for some time. This interest has developed as encounters with technologies such as large screen displays, mobile devices, and sensing systems have become

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increasingly common in our everyday lives—interactions with which routinely take place in front of others. In response, HCI has developed a range of empirical and conceptual accounts (e.g., design frameworks), for instance, [3, 45, 46, 8, 57]. HCI research now supplies plentiful instances of spectatorship as a matter of public interaction, often with interactive displays of varying sizes, e.g., [27, 38, 43]. Frequently these are coupled with body-based interfaces or so-called ‘natural’¹ user interfaces of some form that leverage gaze, gestural or whole-body interactions in order to render them more readily accessible as public displays, e.g., [56].

The role of *spectating in collocated gaming* has recently attracted attention (e.g., [23, 7]), yet there are few *naturalistic* studies of this pervasive aspect of video gaming (excepting Harper and Mentis’s study of Kinect play in the home [16] and Lin and Sun’s exploration of spectating in arcade gaming [29]). This seems very unusual given the mainstream uptake of spectating on gaming more broadly (e.g., Twitch.tv [14]). Specifically we point to a lack of *praxeological* accounts of how the activities of people playing and watching are accomplished. To help remedy this, we offer a detailed study of collocated spectator-player interactions by examining the social organisation of body-based (Kinect) gaming in households.

We note that body-based interfaces typically produce a greater availability (e.g., visibility) of user actions (i.e., they are “revealed” in the terminology of [45]). Therefore, *as novel spectator interfaces*, body-based interfaces also present new experiences for those spectating and therefore offer us a rich site for deepening our understanding of spectatorship in HCI and what spectating looks like as an *organised, participatory* activity. In other words, by looking at the practical details of play in these settings, we seek to emphasise the importance of recognising *spectating* as an interactional accomplishment beyond HCI’s current conceptual emphasis on identifying ‘the spectator’ or

¹ We share strong reservations about the ‘naturalness’ or a given ‘intuitiveness’ of these interfaces [43, 16, 15, 40], and the notion that comes along with this designation as interfaces that somehow do *not* need the development of particular practices.

audience as a specific role or class of roles (e.g., as “orchestrators, managers, coaches, directors, puppeteers, commentators, hecklers” etc. [8]).

To do this, we draw upon a series of fragments of video-recorded Kinect play in home settings, which let us see some of the ways in which those watching play conduct their participation in the game in a range of interactionally coordinated, interwoven, and organised ways. Our video data lets us get a closer look at what it means to ‘do’ spectating, showing the broad range of participatory activities that this can involve. Specifically, we explore how spectating involves activities including: ‘scaffolding’ play as it happens by instructing players in a timely way, critiquing play by closely analysing the bodily conduct of players and providing assessments of this (e.g., to finesse gaming technique), recognising and complimenting displays of player skill and expertise, and reflecting on the game by drawing on practical experience with the game being played and gaming in general.

The inquiry pursued in this paper is organised around three sections. Firstly, we review HCI research on spectator experience in video gaming, and the connection with body-based interfaces. Then, we introduce our approach—ethnomethodology and conversation analysis, or EMCA—and the phenomenon, and present some fragments drawn from our corpus of video data. Finally, we discuss the implications of our study for understandings of the role of spectating on interaction in HCI.

SPECTATORSHIP IN VIDEO GAME PLAY

There has long been a ready characterisation of spectating and spectators—often also termed audiences, viewers, or third parties—as ‘passive’ in contrast with the ‘active’ user, performer, or in the case of this paper, player [50]. As interest in the role of spectatorship has increased in HCI, so there has been a definite maturation of this view towards understanding spectators as participants that are implicated in interaction with technology in various possible ways. In this paper while we are partly concerned with this broader literature on spectators, passers-by, and bystanders who happen to be implicated in interactive systems (e.g., [41]), our primary interest is in how this relates to the activity of video gaming. Contrary to assumptions around gaming practices being largely solitary affairs, it has been argued within HCI that there is a strong *sociability* to gaming [54]. This sociability necessarily means that *watching* gaming is a key component of play, thus gaming has recently developed as a venue for HCI researchers to better understand the nature of spectating more broadly.

Yet initially we must also distinguish *different forms* of spectating on play. Perhaps the most readily recognisable form of spectating is found in ‘e-sports’, where crowds watch large screen displays of players competing against one another [5, 51]. For spectators, this form of watching play involves similar activities to sports spectating: clapping, cheering, talking with other spectators, listening

to commentators, and so on. E-sports events are often broadcast online, and form part of a wider phenomenon of streaming gameplay using platforms such as Twitch.tv where spectators can also interact directly with the player and other users watching via chat features. These have been subject to analyses of audience composition [24] as well as accounts of the community practices viewers [14].

However, mass spectating is only one form. Arguably a more mundane and likely more pervasive form—taking place commonly in households but not exclusive to them—is *collocated gaming*. This has received less focus in HCI although recently the topic has begun to be addressed. For example, Downs et al. [7] used a series of lab experiments to discover the relationship between the physicality of video game play with accounts reported by participants watching players, as well as the anticipatory effects of taking one’s turn at the game. Interventions have also been performed, for example Maurer et al. [31] developed a system to support gaze-based interactions by spectators in order to support players. Yet our work substantially differs from this by looking at spectating practices from the perspective of participants in naturalistic settings.

Our paper also offers some conceptual distinctions that can contribute to theoretical developments on spectatorship in gaming. Building on prior design frameworks for spectatorship (e.g., [3, 46]), HCI researchers studying gameplay have developed various extensions. For instance, Downs et al. describe a spectrum of participation in play for spectators ranging between low to high “levels” [8], while Maurer et al. conceive of this as active and passive [31]. Downs et al. also develop further typologies of spectatorship that provide classificatory frameworks for spectatorship in games and beyond. In doing this, Downs et al. discuss subdivisions of spectator roles that can be used to describe the changing circumstances of play—thus producing a set of “durable roles” (“bystanders”, “audience” and “players”) and momentary “ephemeral roles” that spectators might take on so that they may do other things “beyond just waiting for a turn” such as commenting, coaching, directing, or heckling. This idea of a typology of spectatorship has also been operationalised experimentally, by comparing the effects on players of different spectator ‘types’ such as the negative, positive and neutral spectators of [23]. While our study in some sense does offer examples of, say, practices that seem similar to “coaching” [8], our concern is to articulate these activities as interactionally-negotiated, interactionally-produced matters (i.e., a joint, ongoing *achievement* between players and spectators) rather than ‘states’ that someone is ‘in’.

Our final point of connection with the HCI literature relates to body-based interfaces, which have received considerable interest in HCI recently, including applications in surgery [43], and dance and performance [32] to name a few. Most relevant for us, however, is body-based gaming [19, 16]. The ‘naturalness’ or a given ‘intuitiveness’ of these

interfaces might lead us to imagine that somehow body-based interfaces do not need the development of particular practices—or “specialist techniques” [43]—in order to engage in their use. Yet, interaction with the Kinect, like many body-based interfaces, necessarily involves learning particular kinds of body movements and gestures [16], which itself suggests *new kinds of experiences* for potential spectators beyond more typical methods of interaction with video games (e.g., via handheld controller). Body-based interfaces like the Kinect provide opportunities for this in that they transform readily witnessable bodily conduct (such as gestures, arm swings, foot movements, etc.) into machine-relevant actions. Research on body-based gaming in general often draws attention to the *potential for spectacle* to be produced [19], yet stops short of providing detailed studies of its interactional production. Accordingly, body-based interfaces like the Kinect have featured strongly in HCI work that directly addresses or at least touches upon spectatorship and gaming (e.g., [23, 31, 8, 16, 39]). As Nansen et al. put it, “the Kinect creates a shared and interactive relationship between the player and the audience” [39]. It is *this* relationship that we seek to explicate in more detail in this paper, while at the same time offering us a site for nuancing existing understandings of movement-based gaming [19].

WATCHING AND PLAYING KINECT AT HOME

In contrast with much existing HCI literature that examines spectatorship in physical play and video gaming, we take an approach informed by ethnomethodology and conversation analysis—an established orientation at CHI (e.g., see recent work [44, 48]). We investigate the organised, methodical ways in which social action is ordered and achieved [9, 49], and how these achievements are *endogenously* negotiated and produced, arising from members’ practices. For studying Kinect play, this means that we are interested in the ways in which players and those watching play *work* to make their activities readily intelligible and accountable to the organisation of play. Thus, we are concerned with the detailed ways that the activity of video game playing unfolds moment-by-moment as a matter of orderly action between players and those watching (who may have recently been players themselves).

As a brief adjunct to our literature review above, here we note that spectating features in EMCA oriented research, but not as a focal topic of investigation. For instance, spectators may be in adjacent rooms, as in [30] where dentistry students follow live video broadcasts of a dentist performing endodontic treatments, or in a large auditorium, as in [37] where an audience of trainees inspect a team of surgeons doing surgical operations through live video transmission. Likewise, spectating does not have a central place in the EMCA work on video games (see, for example, [47] for a review of such studies). This may possibly stem from the likelihood that the presence of spectators normatively points to a more ‘central’ activity (e.g., playing video games) which tends to attract greater analytic focus

for researchers entering such settings. However, while it has been suggested by others that EMCA approaches have struggled to gain purchase on ‘playful’ activities [53], examining such activities is not new for EMCA (e.g., [20, 28]), although this literature remains fairly sparse as pointed out by Tolmie and Rouncefield [53]. Nevertheless, EMCA interest in play extends to video games (e.g., see [47]), which, briefly, has studied on-screen actions [2], players’ talk, and bodily conduct ‘in’ and ‘out’ of games [34]. Yet this work also rarely discusses spectating. Thus our paper also offers a novel contribution to the EMCA literature in providing a study of spectating *on video gaming activities*.

Turning now to the practical details of our study, to examine spectating as an interactional phenomenon we draw upon a large corpus of video recorded data of Kinect play in naturalistic settings, based on fieldwork conducted by one of the authors over the course of four months in various household environments sited in Turkey (resulting in 19 hours of video from 12 different homes). A variety of games were played, but the data we present focuses on the Kinect Sports Rivals games, specifically its climbing, tennis, and bowling games. A critical feature of the video captured in these settings is that they often involve the presence of people watching a current player’s bodily engagement with the game in some ways (and perhaps also awaiting their own turn). Therefore, this setting presents a *perspicuous setting* [10] for studying spectating practices, and spectator participation.

Our corpus presents us with a wide range of spectating phenomena. In this study, we focus on four prevalent practices of spectating in order to provide a rounded picture of the diversity of spectating represented in our corpus. In this sense, our fragments present a selective and partial view on spectating that omits some features—for instance, while players and those watching *did* joke with one another [16], we found that more often than not they treated play as ‘serious’. Fundamentally, our selection was guided by an interest in illustrating some of the distinct ways in which spectating is intersubjectively accomplished by *both* parties (i.e., as a collaborative endeavour). Thus we selected fragments that show something of the range *different* forms of participation frameworks [13] that spectating is tied to. Our selection lets us explore how spectating involves working to inspect gameplay as it happens (e.g., establishing visual and bodily alignments), and formulating next actions in ways that are sensitive to the game on-screen and the bodily conduct of player(s). In this way our fragments range across just some of many possible forms: spectators ‘scaffolding’ play moment-by-moment, critiquing play technique, producing recognitions and compliments of player competence, and reflecting on their own play.

Our fragments are transcribed using Jefferson notation [21] (widely used in EMCA). This highlights the sequential and

temporal organisation of turns at talk, and the details of their prosodic delivery. We also employ additional transcription features drawn from Mondada [36] in order to include bodily conduct. Fragment 1 contains annotations (in red) of the meaning of various symbols and aspects of these transcription systems. Turkish utterances are in bold type, with English translations below in italics. Relevant stills from the video recordings are inserted where appropriate with indications of the moments in time they appear with a ‘#’ in the transcripts, and with figure numbers overlaid on the stills. In all fragments, we use the term ‘player’ to refer to participant(s) *directly* interacting with the Kinect (labelled **PL**, or **PL1**, **PL2**, etc.), other participants we consider to be ‘spectating’ and we refer to as ‘spectators’ (labelled **SP**, or **SP1**, **SP2**, etc.)—note that labels in lower case (i.e., ‘**p1**’, ‘**sp**’, etc.) indicate non-verbal actions.

‘Scaffolding’ play

One of the most prevalent things that spectators do during Kinect gaming is to seek to display continuous engagement with the player (particularly when the player is ‘in’ the game [34]). While in some sense all of our fragments exhibit this as a feature of the way spectators organise their participation in the game, here we examine a very clear example of this. In this fragment, the player (PL)—a young child—is participating in a climbing game, and is watched by two others—another child (who is silent for the duration of the fragment) and their grandmother (SP). To progress, the player needs to ‘grab’ holds and move between them, which he achieves with various gestures and larger bodily movements (e.g., physically jumping).



| | | | | | | | |
|----|-----------|-----------|----------------------------|--------------------------|--|-----------|--|
| 01 | | PL | (1.2) | temporal gaps in seconds | | SP | |
| 02 | | | *(1.0)* | | | | bodily conduct of p1 delimited by matching symbols (*, +, %, etc.) |
| | p1 | | *jumps* | | | | |
| 03 | | | (0.2) | | | | |
| 04 | SP | | tut | | | | |
| | | | <i>grab</i> | | | | |
| 05 | | | (1.8) | | | | |
| 06 | | | *(1.1)* | | | | |
| | p1 | | *jumps* | | | | |
| 07 | SP | | i*yi tut | | | | |
| | | | <i>grab tight</i> | | | | |
| | p1 | | *jumps -> | | | | |
| 08 | | | (0.5)* | | | | |
| | p1 | | ->* | | | | |
| 09 | | | (0.2) | | | | |
| 10 | | | *(0.2)* | | | | |
| | p1 | | *grabs* | | | | |
| 11 | SP | | tut | | | | |
| | | | (.) | | | | |
| | | | >tut tut t+tut tut< | | | | |
| | | | <i>grab grab grab grab</i> | | | | |
| | sp | | +looks twrd PL -> | | | | |
| 12 | | | (0.2)+ | | | | |
| | sp | | *(0.2) | | | | '↑' indicates rising pitch |
| | sp | | ->+ | | | | '>' '<' indicates words spoken faster |
| | p1 | | *grabs -> | | | | |

| | | | |
|----|-----------|---------------------------------------|--|
| 13 | SP | tut*ma*dı1:n* | one or more ':' indicate extensions of sound |
| | | <i>you did not grab</i> | |
| | p1 | ->* *grabs* | |
| 14 | | (2.9) | |
| 15 | PL | tüh kötü ol[du | '[indicates overlapped talk |
| | | <i>damn it was bad</i> | |
| 16 | SP | [neyse *başlıyo | |
| | | <i>whatever it is starting</i> | |
| | p1 | *jumps -> | |
| 17 | | ha*di süren dolmadan | |
| | | <i>come on before your time is up</i> | indicates continuation of action by p1 |
| | p1 | ->* | |

Fragment 1: Scaffolding play (transcript legend in red)

Fragment 1 shows how SP adapts her actions to the temporality of the game in finely tuned ways. When PL is ‘in’ the game, SP produces timely instructions to him (lines 04, 07, 11). The first instruction takes the form of a bare imperative (“grab”, line 04); this is uttered precisely at a time when it is relevant and necessary to grab one of holds (not doing so of course resulting in PL’s avatar falling down). SP then issues another instruction, this time formatted as an ‘imperative + adverb’ combination (“grab tight”, line 07). SP, displaying an orientation to the temporal urgency of the game and the need for PL to take action, then produces repeated imperatives (“grab (.) grab grab grab grab”, line 11). This is done as the avatar reaches the next hold, but then starts to fall down (Figures 2 and 3). SP produces these utterances in a way that is again carefully timed with the trajectory of the jump. The first “grab” in line 11 occurs at the jump’s apex but it becomes visible that the avatar is actually falling down. The repeated imperatives point to the urgency to grab—for this particular game, the avatar *can* escape from falling down if the player manages to get it to grab one of the holds during the fall. In line 13 the game then suspends before PL’s avatar is respawned again. During this suspension, SP shifts to an assessment of what just happened moments ago in the form of a negatively formulated utterance (line 13) which places responsibility of the fall on the player (“you did not grab”). After a pause, PL utters his own assessment (line 15), but as a next move he neither accepts nor rejects responsibility, but rather deflects via attributing blame with an ambiguous utterance, “it was bad”. In this way, while this assessment by PL acknowledges the failure, it does not build in any particular agent as responsible. In overlap with this assessment (line 16), SP rejects this deflection of responsibility (“whatever”), while at the same time projecting the restart of the game (“it is starting”), and coupling this with an encouragement that also foregrounds the game’s temporality once again (“come on before your time is up”, line 17).

It is significant to note that SP’s gaze is for the most part directed towards the TV screen (Figure 1). Only towards the end of repeated imperatives does she briefly direct her gaze towards PL. This shows that she uses the game actions displayed on the screen as a resource to instruct PL. While we cannot easily say whether SP’s seated position allows her to simultaneously also keep track of PL’s bodily

conduct (which is also important for this kind of activity), we examine spectating as ‘seeing’ in detail later.

That said, as a broader matter of SP’s participation in play and her ‘scaffolding’ of the courses of action of PL, we can see how she engages in the provision of a range of timely instructions, assessments and encouragements that on the whole demonstrate a keen sensitivity to the *temporality* of the game. Specifically, the ways she formats her instructions at particular moments (bare imperatives, ‘imperative + adverb’ combinations, repeated imperatives) reflect this temporal sensitivity towards the contingencies in the game. SP’s actions here, particularly her continuous instructions to PL as the play unfolds, can be characterised as doing “live” or perhaps “online” coaching (see [18]), while also bearing similarities to what Downs et al. [7] gloss as “coaching and directing” players. This kind of engagement can also be found in Mondada’s studies of console gaming [34, 35], where football game players begin to instruct their co-player at moments when that co-player’s activities are more consequential for the game (related to who has possession of the ball).

Critiquing play technique

Playing different kinds of games necessarily results in quite different temporalities to play. In this fragment we examine bowling, which introduces a very different pace of game. In our fragment we examine some of the more detailed analytic work of spectating, looking at the way players’ gaming movements with the Kinect may be inspected and assessed. While we will see a ‘critical’ kind of spectating here, later in Fragment 3 we will see more ‘complimentary’ forms. Nevertheless, opportunities to perform such assessments are provided particularly when a current spectator is awaiting their turn, i.e., when they are not so much a ‘permanent’ spectator (as in the previous fragment) but rather ‘the next player’.

Here we join two friends playing bowling together (PL and SP). Our fragment is divided into two parts, showing the first and second of two consecutive bowls by the current player. To perform a successful bowl, the player must adjust their bodily position and arm swing using an indicator on-screen that shows the coordination of the throw and therefore future trajectory of the ball (Figure 4).



Figure 4: Triangular indicators in-game

```
01 *(4.2) + (3.0)##
pl *steps left, forwards, right, then back*
sp +reclines ->
fig #fig.5
02 *(2.2)*
pl *bowls*
03 ^(1.7)^
^knocks down four pins^
04 (0.2)+ (0.4) *(0.6) #
```

```
sp ->+
pl *turns towards sp ->
fig #fig.6
05 SP o dengeyi* nasıl sağlıcaz
how will we maintain that balance
pl ->*
06 (0.4)
07 PL ortaya kendisi şeyapiyo
it is doing itself towards the centre
08 ayarı kendisi veriyo
it is adjusting itself
```



Fragment 2a: Spectator ‘leaning in’ to troubleshoot play

As we see in Fragment 2a, to make the first throw, PL initially adjusts his body spatially by making small steps left, forward, right and then slightly back, tracing out a circle of sorts. As he does this, SP lays down on the couch (Figure 5, line 01). This generates a different visual alignment for SP in his perspective on PL and their actions with respect to the game as it unfolds on-screen. PL performs a small step forwards as he then bowls (line 02), knocking down four pins out of ten. After this, the game is temporarily suspended to show the scoreboard, whereupon SP straightens up somewhat, and PL moves slightly to the side, turning towards him (line 04). This establishes a new interactional space [26, 33] between them (Figure 6). Within this new arrangement, SP produces a question regarding the coordination of an appropriate bowling position (determined by the bodily position of the player) and the swing performed (SP describes this coordination as “balance” and positions this as a matter for both of them, i.e., the pronoun ending associated with the person plural, line 05, or “we”). There is a brief pause, after which PL assumes the next turn-at-talk, hearing the question as a criticism—i.e., he attributes responsibility for his performance to the Kinect as the agent managing the coordination between bowling position and swing (lines 07 and 08). PL then continues with the next bowl.

```
09 (4.0)
10 *(1.4) + (5.4)##
pl *steps left, forw, pause, right, and left*
sp +reclines ->
fig #fig.7
11 *(1.9)*
pl *bowls with stationary feet*
12 ^(2.0)^+
^knocks down remaining six pins^
sp ->+
13 PL çok güzel
very nice
14 *(0.4) #(0.4)
pl *gazes towards sp ->
fig #fig.8
15 SP atarken de bo*zuluyo ama
```

pl but it is going wrong while throwing
->*

16 (0.7)

17 PL bozulsun o
it does not matter if it goes wrong

18 ben köşeye doğru vurdum zaten
I already threw it towards the corner

19 (0.6)

20 PL çizdim bak
look I drew ((the line))

21 (0.2) *(0.6) +(0.8)+ (0.3)*
pl * looks towards sp *
sp +nods +



Fragment 2b: continuation of Fragment 2a

In Fragment 2b, we see a similar organisational structure to Fragment 2a. PL searches for a particular bodily-spatial positioning (line 10) while SP reclines to secure a visual alignment between PL and screen (Figure 7). However, it is notable that PL's movements in line 10 do not simply repeat his prior action from line 01. This time PL swings his arm and bowls with stationary feet, knocking the remaining six pins down, followed by a replay of the throw then a display of the scoreboard. As this happens SP straightens slightly, with PL—who starts to gaze back at SP—moving into a similar spatial arrangement once again (Figure 8). As PL does this, SP this time produces an utterance (“but it is going wrong while throwing”, line 15), with which he problematises the coordination of PL's bowling position and throw. This is also related to his previous question in Fragment 2a (line 05). Before, PL attributed responsibility to the Kinect, but here SP pursues his earlier critique nevertheless, in effect dismissing PL's claim that there is some deficiency in the Kinect's sensing capabilities and / or the game's design. PL then in turn dismisses this 'extension' of the critique from SP (lines 17 and 18), and points to the scoreboard displayed on the screen (“look I drew”, line 20), and referring to his success of achieving a spare nevertheless (represented with ‘/’ on the scoreboard and which PL also traces in the air with his hand).

As we now turn to a deeper analysis we note that this fragment, like Fragment 1, involves SP producing utterances (lines 05 and 15) that themselves follow a delicate temporal placement, where both are uttered sequentially after PL bowls. In other words, SP demonstrates sensitivity to the temporality of play as he deploys questions and assessments. Yet there is more happening here that is of interest. Thus we now pick up on three points to develop our analysis: the critical nature of the assessments being done; SP's analysis of PL's bodily actions; and bodily action conducted by SP himself.

On the first point we note the following. In the first bowl (which knocks down four pins out of ten), SP questions the general coordination, and in the second one (which knocks down the remaining six pins and thereby makes a spare), he makes a further negative assessment. SP works to inspect play by attending to and drawing upon various resources that are available to and continuously unfolding in front of him. Furthermore, though PL's second bowl actually achieves the best possible result in the circumstances (i.e., knocking down all the remaining pins), SP *still* does not produce a compliment at this moment (i.e., a normatively expected place). Instead, SP builds his assessment of the play of the game. Here we can thus see how a sense of SP's conduct as 'critique' emerges.

On the second point, SP's analysis of the player's body is central to forming these assessments. After the first bowl, the question SP utters deals with the coordination (or “balance” in the spectator's own words) between the body of PL and the “body's double” [25], i.e., that which is represented in the game. In doing this SP is at the same time indicating a need for PL to adjust and position his body in space in particular ways. However, after this, as we saw, SP deflects any critique of his bodily movements towards a failure of the Kinect's recognition, although interestingly in his second bowl, his preparatory movements (line 10) *are* indeed different. What is interesting here is that SP raises the issue of the PL's adherence to a particular kind of “bodily discipline” [52] imposed by the Kinect sensor. We note that these are *not* just “ordinary gestures” [22] in the sense that physical movements may be routinely produced in front of screens yet also pertain to what they show. Instead, as Harper and Mentis describe, the bodily discipline of the Kinect player involves the discovery of a “regime of body movements and gestures” [16]. Being able to *see and remark* on this discipline becomes relevant for the spectator in doing critiquing.

On the final point, we note that SP also repeatedly arranges his own body in a reclined way as PL prepares to swing his arm. In doing so, SP can visually align himself in regard to the bodily movements of PL, and the corresponding actions sensed by the Kinect—and of course the resultant sensing of those actions as represented on-screen (e.g., by the indicator in Figure 4). This is a kind of ‘dual vision’, one might say, which then becomes a resource for SP both in his initial question about coordination (line 05) and subsequent critical assessment of the trouble with the player's swing (line 15).

Recognising and complimenting competence

As well as involving critiques of player conduct, spectating also involves doing positive assessments of play (as “supporters” [8]). The following fragment is part of a larger sequence in which two players are competing at tennis (PL1, PL2) while one spectator watches (SP). As we join the action in Fragment 3, PL1 and PL2 are engaging in a rally, with PL2 having just returned the ball to PL1.

```

01 (0.8)
02 *(1.8)*
pl1 *hits the ball*
03 (0.3)
04 $(1.3)$
pl2 $fails to return the ball$
05 (0.7)
06 SP bayağ +sert vuruyon # haa:
you are hitting quite powerfully
sp +gazes towards pl1 ->
fig #fig.9
07 top gi*derken # bile +ses *şey yapıyo
even while the ball moves it is
making a sound
pl1 * gazes towards sp *
sp ->+
fig #fig.10
08 PL1 vururum kan[*ka
I hit it mate
pl1 *serves for next game ->
09 SP [iyice ayıktın sen duruma
you really have understood the situation
10 (0.7)* (1.1)
pl1 ->*

```



Fragment 3: A spectator complimenting a player

We see in line 02 that PL1 hits the ball back to PL2, with PL2 failing to return the shot, which results in PL1 gaining a point in the game (line 04). On completion of this rally, SP produces a positive assessment about the technique of PL1 (“you are hitting quite powerfully”, line 06). This assessment, during which SP gazes towards PL1 (figure 9), integrates an account of the player’s bodily conduct and gains its appreciative character from its timely production sequentially, i.e., positioned directly after winning the point. SP continues, elaborating this assessment as PL1 returns his gaze (Figure 10, line 07). In doing so SP also draws upon the audio-visual properties of the game—particularly the sound ‘generated’ by PL1’s rapid, powerful arm swing as he hits the ball—in order to build on his appreciative, positive account of the player’s conduct. PL1 immediately follows this with a confirmatory account of his action (“I hit it mate”, line 08). In doing this, PL1 acknowledges SP’s assessment and then starts to serve the ball for the next opening shot. Finally SP generalises his assessment of the player’s competence (line 09).

SP’s recognition and appreciation of PL1’s gameplay help to ‘position’ his spectating activities in two ways. Firstly, SP displays himself as a keen, competent observer of the game, who is actively interested in the proceedings of play even though he is currently ‘just’ watching (in that sense we could say he is being a ‘good spectator’). Secondly, in complimenting the competence of PL1, SP is also displaying an ability to recognise ‘good play’. That is to

say, the very recognition of skilled play can speak of a spectator’s *own* competences in the game—i.e., as someone who possesses sufficient practical game knowledge and stock of play experiences so as to be able to see, assess, and produce appropriate judgements of the skilled embodied performances of other players.

Reflecting on play

The forms of spectating in our fragments up to this point have been quite tightly tied to what is happening at any given moment in the game ‘now’. In contrast we now examine a moment where spectating involves reflection on past play, built into the organisation of current play. As a matter of occasioning this reflection, we join the same group as Fragment 3—albeit playing bowling now—where a spectator is ‘in transition’ between being an active player to someone watching play. Our fragment begins as one member of the setting (SP1) is sitting down the couch having just played a turn, while the another (PL) is getting ready for his turn, stepping forwards. During this, another spectator (SP2) is still sitting waiting for his turn.

```

01 *(1.6)+ (2.8)
pl *>>steps forwards, prepares for bowl ->
sp1 +>>sits down+
02 SP1 yürüyerek atınca
when you throw while walking
03 biraz daha sanki şey
it is a bit like
04 hızlı gidiyo
it is as if it goes faster
05 SP2 [hızlı gidiyo öyle
it goes faster like that
06 (0.3)* *(0.2)
pl ->* *bowls ->
07 SP2 şu enerji*yi felan varsa
that energy and so if available
pl ->*
08 SP2 onu kullanırıyor
it makes you use that
09 (1.8)
10 SP1 s[s:-
11 SP2 [øhatta %şu *bov%ling hareketi var ya
actually you know that bowling movement
sp2 øgazes towards pl ->
sp2 %,,,,,,,%moves feet ->
pl *gazes towards sp2 ->
12 SP2 a#yak # hareketi%
the foot movement
sp2 ->%
fig #fig.11 #fig.12
13 SP2 onu* yaøparsan daha da şey
if you do it it is even greater
pl ->*
sp2 ->∞
14 (1.2)

```



Fragment 4: Reflecting on play

Here, while PL is preparing himself (lines 01-06), SP1 produces an observation about the relationship between physical mobility and bowling speed, i.e., that the bowling ball in the game “goes faster” if you “throw while walking” as opposed to using a stationary swing of the arm, thus potentially improving play. SP2 joins in (line 05) displaying agreement with SP1. After a brief pause just as PL bowls (line 06), SP2 continues the conversation by building on the reflections of SP1, introducing the notion of in-game energy (power-up), by which the participants are referring to special features (i.e., ‘super’ bowls) which become available to players by using the bodily techniques under discussion (lines 07-08). Just after PL’s bowl has knocked down all but two pins, SP2 starts gazing at PL and shares another reflection regarding foot movement (lines 11-13). His utterance embeds a claim that performing this foot movement while bowling makes the bowl more powerful. As he utters this, SP2 raises his feet, keeps them up for a while and moves them mid-air with a ‘peddling’ motion, demonstrating [8] the foot movement (Figures 11 and 12). SP2 performs this *as* he secures the player’s gaze (line 11), gradually raising his legs during PL’s turn towards him. PL attends to SP2’s commenced demo in a momentarily similar interactional space to Fragment 2.

What we see in this fragment is how SP1 topicalises having recently been a player, and that this observation acts as a ‘reflection’ on his activities. Becoming a spectator, transitioning from player to spectator [3, 46, 1], makes it *relevant* to comment upon previous play—SP1’s utterance gains its sense as a reflection by being done at this particular place in the sequence of interaction, i.e., by its sequential positioning after the end his turn-at-play and coordinated with his sitting down (just as a greeting is done at the opening of an encounter and gains its sense as a greeting in-and-through that [17]). Having just had a turn-at-play affords a sense of ‘authority’ about being able to ‘speak’ about the details of performing game actions (such as the motion of one’s body and feet).

Over the course of the fragment, SP2 essentially transforms the reflection by SP1 into an instruction directed at PL’s play. This is achieved because SP1’s reflection also tacitly provides an instruction to the other participants in the game—that they adopt a different kind of bodily engagement with the Kinect that is more mobile and less stationary during a bowling swing. In overlap with this, SP2 produces an assessment (line 05). This overlap is affiliative and claims and confirms a similar knowledge and experience to SP1 [12]. SP2 then further develops the reflection of SP1, and produces two different instructions in the form of assessments (lines 07-08, and 11-13) regarding bodily conduct in-game.

This final part of the fragment also further reveals the ways in which the timing of talk and bodily actions of the spectators here are carefully oriented around the player’s actions, and help us further unpack what SP2 is doing.

Briefly prior to SP2’s utterance on line 11, SP2 and SP1 have been conversing with one another. This temporally coincides with a natural moment of pause for PL as he has just bowled. In line 11, SP2 gazes at PL as he starts to produce his utterance and moves his feet slightly up. After receiving PL’s gaze, SP2 launches into “that bowling movement” and simultaneously performs his demonstration with his feet, with his body still reclined somewhat on the couch. The careful timing of this interaction is used to manage and configure the intertwined participation frameworks between the three of them [13] in spite of the bowling game engaging only one player at a time directly. On this last point we also note that offering instructions and instructive demonstrations to others in a *competitive* gaming environment further reflects the spectators’ orientation towards collaboration.

DISCUSSION

In its broadest framing, our study has sought to draw a distinction between ‘being a spectator’ and ‘doing spectating’—while HCI research has explored the former extensively, we are more interested in the latter, which we have argued can be understood as an interactional phenomenon that is negotiated, managed and achieved moment-by-moment between participants in a game. The primary contribution of this paper has been to provide a detailed study in a naturalistic setting of the complex analytic work of spectating and the organised ways in which spectators *participate* in interaction with players (cf. [42]). This also builds upon preliminary examinations of Kinect play [16]. In some sense our use of the term ‘work’ is literal as well as metaphorical—spectatorship isn’t always a smooth road and really has to be continuously *worked at*. In many ways the detail of this analytic work is the stuff of enjoyment in video game play [4].

Our discussion here is structured in the following way. First, we review the salient findings of our study. Then, we use these to refine some concepts of spectator roles and spectating in HCI. Subsequently, we conclude with a consideration of some possible implications for designing the spectator experience in HCI.

Spectating in and around gameplay with Kinect

A theme that has been repeatedly foregrounded by our analysis is the idea that **spectating is strongly temporally-oriented** towards both the organisation of the game being played and the organised conduct of players (and of course any other spectators, such as the pair found in Fragment 4). In Fragment 1 we see this very clearly with the spectator’s production of timely imperatives such that they are tightly interwoven with the conduct of the player and the game on-screen. Spectating also involves structuring the form of participation in play around projected moments. In Fragment 2 the temporal organisation of turn-taking in bowling is used by the spectator to project and locate appropriate slots to produce assessments of the player’s recent actions and provide an opportunity for the player to

produce revised actions when the game resumes. Fragment 3 involves the spectator producing a compliment about the player at the end of a rally, while in Fragment 4, we see a similar moment that one of the spectators takes as an opportunity to provide a demonstration to the player.

Secondly, we have uncovered some of the **interactional resources involved in spectating** that are employed in the course of their analytic work. This includes resources that are more immediately ‘obvious’ such as deployments of particular forms of talk (e.g., assessments, Fragment 3), and bodily conduct (e.g., shifting one’s body to develop certain visual perspectives on the player and screen, Fragment 2). It also includes more subtle features such as adjustments of gaze (e.g., waiting for opportune moments to complement a player, Fragment 3, or to establish an interactionally and temporally appropriate moment to perform a demonstration, Fragment 4). Spatial aspects are also crucial resources, such as the establishment of common interactional spaces via bodily arrangements of players and spectators as we see in Fragments 2, 3 and 4.

Thirdly, a significant but perhaps underexplored element of spectatorship is **spectating as ‘seeing’**. This is particularly the case for seeing certain kinds of bodily conduct by players, the “ambiguity of movement” and its relationship to the sensor [19]. Although spectating on Kinect gaming do not involve a *professional* commitment to seeing as in, say, the seeing of particular kinds of movement qualities in performance practices [32]—and it would also be incorrect to characterise their activities as “professional vision” [11]—our fragments show that spectating nevertheless *does* often involve careful scrutiny of player activities (including what is available on-screen). However, our study also finesses this point. Seeing is embedded in practical courses of action and here it is no different. This means that ‘seeing’ done as a matter of spectating is not *only* about observing the movement of a player’s feet (Fragment 4) or that a player is performing hand grabbing actions (Fragment 1). Rather, it is about *seeing that there are interactional implications of these*, i.e., “in circumstances where they are relevantly to be seen” [6, p. 260]. For instance, this means seeing that the player didn’t move their feet forwards in such-and-such a way within a broader bowling activity, or seeing that a hand grabbing action must continue as a temporally-sensitive matter as the player’s avatar begins to fall. In this sense spectating means also drawing on a ‘dual vision’; that is, seeing the player(s) and the screen as one, as a gestalt—although we note that certain spatial arrangements may enable or hinder this dual vision.

Fourthly we want to underline the importance of **spectating as bodily work** in conjunction with seeing work—a feature of spectating within our study which is perhaps most clearly tied the Kinect sensor itself and the bodily discipline of players. Seeing is not purely ‘ocular’ but practically embedded in spectators’ own bodily courses of action. Perhaps most obviously spectators are bodily engaged in

particular compartments and arrangements on couches in all fragments so as to provide particular visual possibilities. But, bodily work in spectating is also sequentially organised; hence in Fragment 2 we see how the spectator coordinated his own posture in a way that supported his ability to see particular alignments between the player’s body and screen at particular sequentially-relevant moments during bowling. There are of course other kinds of bodily work, such as in Fragment 4 where the movement of the spectator’s feet offer a demonstration in order to finesse the bodily conduct of the player.

This leads to our final point about the **‘authority’ of spectating**. Doing spectating provides participants with rights, and sometimes obligations, to instruct, assess, compliment, critique, etc. the players and their conduct. To produce such actions necessitates the spectators to understand and draw upon the game-related actions players perform and the disciplined bodies they adopt, which are required so as to be ‘seen’ by the Kinect. The kind of authority in question here is mainly related to not being the agent for the activity. Spectators are not directly controlling the game (be it avatars or other in-game representations of the players), meaning that it is relatively easier for them to talk about, for instance, what needs to done in the cases of failures in gaming space. This is the case in Fragment 1, where the spectator produces continuous instructions for the player via a series of imperatives. A further layer of the authority of spectating is based on having just recently had a turn in game, as we see in Fragment 4. In that fragment, SP1, and subsequently SP2, build upon their prior game experiences to discuss their current approaches to play. SP2 even demonstrates the foot movement that he claims lead to better outcomes in game. In short, doing spectating is connected to having a measure of authority, and this authority is itself often ‘at play’ in the game as it unfolds.

Spectators and spectating in HCI research and design

Next we turn to consider the conceptual implications of our study for existing characterisations of spectating and spectators in the HCI literature, particularly for video games.

Firstly, our study has identified a diverse range of spectating practices. Here we point to Harper and Mentis’s prior accounts of Kinect play in the home, which has emphasised the “fostering [of] laughter” and moments of “ridicule and mockery” as key characterisations of the social organisation of Kinect play [16]. However, while the broader corpus of our video recordings certainly presented moments that reflected this, our fragments also show a much greater range of participatory forms of spectating. This has included instructing, critiquing, complementing, reflecting, and so on. Importantly, we have unpacked these in detail, thus locating such spectating practices as deeply endogenous concerns of the setting which are interactionally achieved between player and spectator.

Secondly, as we have noted before, spectator experiences have often been formalised in various design frameworks, in terms spectrums of passive to active participation [23], and as part of constellations of discrete roles such as player, spectator, or bystander, which are transitioned between by members of a setting [8, 46]. In these frameworks, spectatorship may itself involve further subdivisions or personas that finesse these distinctions [8], such as spectators acting as “assistants” to players [5]. Our paper offers two contributions in this regard. As noted above, our study provides an enriched account of the diverse activities of spectators that in many senses builds detail around those of [8]. At the same time, the highly participatory nature of spectating that we have articulated might give us pause when considering assignments of particular and distinct ‘roles’ to them (also see [29]). Spectating in our study is an interactional matter, i.e., it is achieved moment-by-moment as a matter of participation with the current player. Who is and who is not a spectator is sometimes a moot point [55]; rather, for design in HCI we might perhaps consider what *courses of action* does spectating involve? Equally it leads us to ask at what point the terminology of ‘spectators’ and ‘players’ no longer necessarily helps us analytically understand settings and circumstances (and therefore might even cloud design understanding)? While we would not suggest abandoning distinctions or avoiding the assignments of the category of ‘spectator’ to members of a setting for the purposes of interaction design, at the same time we are left wondering what the end-game from a design point of view is for developing more and more gradations of spectator ‘states’ in terms of roles and subroles.

Design possibilities for spectating in HCI

Finally, based on the main contribution of our findings, we consider more specific design implications for HCI. Explorations of ways to support the spectator as participant in play have emerged in HCI recently (e.g., [31]). Our study has presented opportunities to think about spectating as a participatory activity in play and how this is achieved by diverse methods. In a broad sense it confirms that spectators do indeed play a role in *assisting* players, yet the ways they do so is more collaborative and complex than previously reported. This leads us to three design possibilities

1. Spectating involves complex analytic work, both in seeing the player, and seeing the game (i.e., ‘dual vision’). This alternative perspective to the active player invites game designers to consider offering game elements that are *only* available to the perspective of spectating but which contribute to the game in some way.
2. What spectators can do analytically during play may range between continuous engagement in ‘scaffolding’ through to offering post-hoc reflections on their own play. This suggests an equally broad range of temporal modes of participation that could be supported by any

given game. There is a substantial difference between spectating on a game that is continuous compared with spectating on one where play is suspended at particular moments.

3. Whole body interaction supported by sensors like the Kinect prevent the spectator from engaging in certain forms of physical participation, particularly in things like demonstrations. This leads to technical challenges for sensing systems that (perhaps counterintuitively) detect the player yet *ignore* the spectator in order to enable greater participation [8].

CONCLUSION

In this paper we have presented a close and detailed look at spectating in the home around Kinect gaming, examining how such spectating practices are sequentially ordered and temporally coordinated with players and the game in play. To the best of our knowledge, our empirical study seems to be the first of its kind in exploring—in a detailed, naturalistic way—spectating in collocated gaming settings where body-based interfaces act as game controllers. In doing so we have demonstrated that, by examining the local sequential organisation of conduct by spectators and those they are watching, we may better understand the dynamic interactional and participatory nature of spectating, and its implications for HCI’s understanding of spectatorship and spectating.

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