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10 Lenses to Design Sports-HCI

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10 Lenses to Design Sports-HCI

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ABSTRACT

Interaction designers are increasingly interested in the physically active human being. However, recent work suggests that HCI is still at an early stage when it comes to supporting the many virtues of engaging in sports. To advance this, we present a set of 10 lenses based on virtues aligned with sports activities to help designers to see physical activity not just as a way to prolong life, but as opportunity for personal growth. The Sports-HCI lenses facilitate learning how to appreciate a void (Reverie), finding pleasure in exertion (Pleasure), become humble (Humility), enjoy the stimulation that comes from fear (Sublime), be more aware of one's own body (Oneness), value sacrifice as a chance for a simpler existence (Sacrifice), bring beauty into the world through movement (Beauty), see benefit in pain (Pain), foster consistency for life (Consistency) and welcome patience (Perseverance). We examined related work and reflected on our own craft knowledge in order to articulate what opportunities interactive technology offers to every lens. With this, we aim to support interaction designers in facilitating the many virtues of being physically active.

1

Introduction

HCI researchers and interaction designers in particular are increasingly interested in supporting exertion experiences. These are experiences that require significant physical effort from participants (Mueller *et al.*, 2011), in contrast to the prevalent mouse and keyboard interactions in the field. In recent years, the increased availability and reduced cost of sensor systems have led to a plethora of wearables such as smart sport watches that can track exertion activities. There is also sport clothing that has sensors embedded to sense bodily responses to exertion activity such as heart rate, allowing for new ways to support the fitness activity. And there are also game console accessories (one of the earlier ones being the Nintendo Wii, then the Microsoft Xbox Kinect and now movement-tracking VR headsets) that sense body movement to enable exertion sensing in the living room. Technical advancements like these have led to an increased interest into exertion experiences by the research community, resulting in the term “Sports-HCI” (Mueller *et al.*, 2015). However, commentaries have also recently emerged that highlight that the field has only begun to facilitate the many virtues of exertion (Höök *et al.*, 2015; Márquez Segura *et al.*, 2016; Segura *et al.*, 2013).

We refer to the emerging discussions that criticize how current investigations in interaction design take a view on exertion that is too narrow (Marshall and Linehan, 2017; Marshall *et al.*, 2016a; Segura *et al.*, 2013). Their authors argue that this narrow view is a logical consequence of the often underlying assumption that people only engage in exertion activities solely to improve their physical health, therefore missing out on the many other benefits of being physical active (Höök *et al.*, 2016; Márquez Segura *et al.*, 2016; Marshall *et al.*, 2016b; Mueller *et al.*, 2016; Purpura *et al.*, 2011). If exertion only improves physical health, we could argue that it only helps to defer death. This is commendable, however, it does not say anything about the fact that exertion can also improve the quality of life. By taking this aforementioned narrow assumption, the interaction design community misses out on the chance to support such improvements to the quality of life. We note that a similar argument has previously been made in the context of human-food interaction, where Grimes and Harper have argued to go beyond an instrumental perspective on the coming together of interaction design and food to embrace an experiential perspective that celebrates our food interactions more holistically (2008).

We believe that works in HCI around exercise and health often make the underlying assumption that the human body can, like the computer, be seen as a machine (for example, see the early HCI illustration that depicts the human brain with in- and outputs like a computer (Card *et al.*, 1983)). However, we believe that by treating the human body as such a machine, we simplify our embodied existence too much (Damasio, 1999; Lakoff and Johnson, 1999; Westphal, 2016; Mueller *et al.*, 2018). We believe that engaging in exertion activities can enrich the human mind, while the mind guides and reflects upon the exertion activity, which ultimately helps us to grow as a human being. To help interaction designers engage with this, we introduce HCI to virtues aligned with sports activities that stress this important interplay. We believe that, so far, the role interactive technology can play in this has been underdeveloped. We believe that interactive technology can be used to “design sports” (Mueller *et al.*, 2011), and as such, we find that interaction design features a particular opportunity to develop exertion

systems that facilitate personal growth. Facilitating personal growth is important, as it can help people identify who they are, who they want to be and how to get there (Kretchmar, 2005; Young, 2014). As such, we see this article as an attempt to guide designers create interactive systems that help users to learn something about themselves, who they want to become and how to get there, through exertion experiences. We argue that interactive technology offers powerful opportunities to achieve this, and we hope this article enables a structured discussion on how this can be realized in the future.

However, so far, there is only limited understanding available on how to use interactive technology to facilitate personal growth through exertion experiences (with a few exceptions such as Mueller and Young (2017) or Mueller and Pell (2016)). To expand this understanding, this article makes a contribution in the form of a theoretical discussion of a set of 10 lenses that aim to aid designers who want to create interactive systems for exertion experiences. Prior work has used lenses before in order to sharpen interaction designers' perspectives on embodied issues (Klemmer and Hartmann, 2006; Dourish, 2001). We are inspired by this use of lenses. Our hope is that these lenses help designers take on particular perspectives on exertion experiences when designing technology. We believe lenses have the particular advantage that they highlight that designers can take on a range of particular perspectives on the same phenomena, and that there is no easy "right" or "wrong" when it comes to designing technology for such phenomena, rather, it always depends on what kind of perspective one takes. We unpack each lens into three components in order to provide designers with practical handles so they can engage with them in their design practice. We complement them with design examples from either prior work, our own design practice or fictitious examples to suggest how such thinking can lead to particular designs.

In particular, our lenses are inspired by the notion of virtues, the Latinized translation of the Greek word *arête*, which means "excellence". Virtues have been previously discussed in ethical philosophy in general (MacIntyre, 2013) and sports philosophy in particular (McNamee, 2008; Young, 2014), as well as in the context of HCI, but mainly to support

diverse user groups (Epstein *et al.*, 2013). A virtue is a desirable disposition, a tendency to do the right thing in the right time and place (Young, 2014), however, we caution that it is not possible to reduce a virtue to a simple design guideline, as it can only be developed by acting well in varied circumstances. Exertion activities can help to develop such excellent dispositions, and we argue that interaction design can support such developments.

Our lenses highlight that exertion experiences can support personal growth through learning how to appreciate a void (Reverie), find pleasure in exertion (Pleasure), become humble (Humility), enjoy the stimulation that comes from fear (Sublime), be more aware of one's own body (Oneness), value sacrifice as a chance for a simpler existence (Sacrifice), bring beauty into the world through movement (Beauty), see benefit in pain (Pain), foster consistency for life (Consistency) and welcome patience (Perseverance).

Our set of lenses is only a starting point as a result of our engagement with virtues and our own craft knowledge derived from having designed exertion experiences for over a decade (Khot *et al.*, 2014; 2015; Mueller *et al.*, 2011; 2014; 2010b; Pijnappel and Mueller, 2013; 2014). As such, we focus on lenses that we believe are underexplored and where technology offers unique opportunities for designers who want to expand the field. Our goal is to give design practitioners and researchers a set of directions to think about when they approach designing new sports-HCI experiences and a language for describing current ones. By letting the lenses emerge out of existing examples, we hope we enable the creation of new lenses and refinement of the existing ones. Our work therefore supplements other discussions that aim to drive the field forward (such as a game perspective (Linehan *et al.*, 2015) or a health perspective used to critique the field (Marshall and Linehan, 2017)).

The target audience for this article is design practitioners who want to create better interactive exertion experiences. Researchers can also use this article to analyze exertion systems in order to understand what virtues they potentially facilitate, providing them with a structured approach to discuss technology-augmented exertion experiences, allowing to go beyond single perspectives such as calorie expenditure as frame

of analysis (for a critique of such approaches see Marshall and Linehan (2017)). If we would continue to engage such a single-perspective on exertion experiences, we believe that the field will not be able to grow and reach its full potential. This will result in users missing out on profiting from the many benefits associated with exertion.

In summary, we have articulated the need for a new approach to the design of exertion experiences. We have also explained the reason why we look at virtues. In the next section, we will describe related work and what we have learned from this. In the section that follows we present our set of lenses. These lenses are accompanied by particular opportunities interactive technology offers to designers; as such, with our work, we aim to highlight how new technology enables novel ways to support old virtues. We also articulate examples of this thinking in practice from our own work in the field and other people's design examples.

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