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ENCOUNTERS WITH ALGORITHMIC SYSTEMS, THROUGH THE GAME METAPHOR

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ACADEMIC DISSERTATION

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ABSTRACT

The dissertation project applied the game metaphor, supplemented with frame analysis, to examine encounters with algorithmic systems (interconnected combinations of elements such as code, people, and data). The dissertation comprises a summary introduction and three peer-reviewed articles. Two of these (articles I and III) discuss encounters with systems that personalise content for users, in one setting also considering the perspective of the main designer of the system under scrutiny. The final study reported upon (in Article II) focused on a model designed to identify hate speech from municipal-election candidates' social-media posts. It considers perspectives of both the system's creators and opponents of the model. The main findings from the research are that 1) metaphorical games can be created and altered via various moves, including those made with or by algorithmic systems; 2) particular frames of games are separated from the surrounding reality by spatio-temporal brackets that support frame-specific meanings; 3) individuals may play for others or enrol others to play for them, with what it means to win or lose hinging on who is playing, for what and whom; and 4) controlling what is visible to a specific player is especially important in games that include algorithms, since algorithms cannot understand most changes in the frame of activity.

With Erving Goffman's work on games and frames as a theoretical basis, the dissertation illustrates how encounters with algorithmic systems can be approached as relational processes wherein diverse actors, working together and against each other, construct the games they play. The moves they make in relation to each other, along with the technologies present in the situation, alter and uphold the frames articulating what the game is about. Algorithmic systems may be used to transform meanings so as to both create new definitions of situations, conceptualised in the dissertation as games, and change the nature of existing games (as discussed in articles I and II). These games can be understood as separated from their surroundings by brackets of various kinds (per Article III).

Because of how algorithms register and process various actors' moves, they may not necessarily end up serving the ends originally intended, as with 'gaming the system', or may bring setbacks in cases of mismatch between the context and system functions, such as offering irrelevant recommendations after shared use of a media-streaming-service account. Who serves what entities or interests may change rapidly when algorithmic systems are involved, since individuals may use services on behalf of others (discussed in Article III) or enrol algorithms to serve their own interests (discussed in Article II). Algorithms are unable to perceive the world similarly to how humans do, so manipulating them by altering the information they receive from one's actions looks very different from attempts to fool humans (discussed in Article

II). Likewise, algorithms cannot recognise changes in the frame where they are engaged with people – for example, from solitary to group use (addressed in Article III).

The dissertation illustrates the game metaphor's utility for studying how algorithmic systems' meanings and roles in a given situation are defined and redefined in interaction. Additionally, combining the game metaphor (especially the concept of a move) with frame analysis reveals how frames are defined in interaction. This approach offers a contrast against approaches wherein frames are presumed to be static constructs that individuals can find and identify in the world. The empirical findings and conceptual contributions provide ways of understanding algorithmic systems as part of our day-to-day relationships, where the meanings they gain depend upon the situation wherein they are encountered.

TIIVISTELMÄ

Tutkin tässä väitöskirjassa kohtaamisia algoritmisten järjestelmien kanssa. Algoritmisilla järjestelmillä viittaan yhdistelmiin erilaisista osista kuten koodi, ihmiset ja data. Käytän analyyttisena työkalunani pelimetaforaa täydennettynä kehysanalyysilla. Väitöskirja koostuu yhteenvedosta ja kolmesta vertaisarvioidusta artikkelista. Kaksi artikkeleista (artikkelit I ja III) käsittelee kohtaamisia sellaisten järjestelmien kanssa, jotka personoivat sisältöä käyttäjilleen. Molemmissa artikkeleissa tutkitaan käyttäjiä, mutta toinen näistä artikkeleista ammentaa myös järjestelmän pääkehittäjän näkemyksistä. Yksi artikkeleista (Artikkeli II) keskittyy malliin, jolla pyrittiin tunnistamaan vihapuhetta kunnallisvaaliehdokkaiden sosiaalisen median julkaisuista. Artikkelissa käsitellään sekä mallin kehittäjien että sitä vastustavien ihmisten näkemyksiä. Väitöstutkimukseni päälöydökset ovat seuraavanlaiset: 1) vertauskuvallisia pelejä voidaan luoda ja muuttaa erilaisten liikkeiden kautta; 2) eri kehyksillä on ajallisia ja tilallisia sulkeita, jotka toimivat niiden ja niitä ympäröivän todellisuuden välisinä rajoina ja tukevat kehyksen sisäisiä merkityksiä; 3) yksilöt voivat pelata myös muiden puolesta ja saada muita pelaamaan omasta puolestaan, ja se, mitä voittaminen tai häviäminen tarkoittaa, riippuu siitä kuka pelaa minkäkin puolesta; ja 4) sen hallitseminen mitä näkyy kullekin pelaajalle on erityisen tärkeää peleissä, joissa on mukana algoritmeja, sillä ne eivät kykene ymmärtämään muutoksia toiminnan kehyksessä samalla tavoin kuin ihmiset pystyvät.

Pohjaten Erving Goffmanin työhön pelien ja kehysanalyysin parissa väitöskirja havainnollistaa, miten kohtaamisia algoritmisten järjestelmien kanssa voidaan lähestyä relationaalisina prosesseina. Näissä prosesseissa erilaiset toimijat rakentavat pelejä, joita he pelaavat toimien sekä yhteistyössä että toisiaan vastaan. Liikkeet, joita nämä toimijat tekevät suhteessa toisiinsa ja tilanteeseen liittyviin teknologioihin ylläpitävät ja muuttavat sitä, mistä pelissä on kyse. Algoritmisilla järjestelmillä voidaan sekä synnyttää uusia tilanteenmäärittelyjä, joita tässä väitöskirjassa lähestytään vertauskuvallisesti peleinä, että muuttaa jo olemassa olevien pelien merkityksiä (Artikkeli 1; Artikkeli II). Näiden pelien voidaan ymmärtää olevan erotettuja ympäristöstään erilaisilla sulkeilla (Artikkeli III).

Algoritmit voivat päätyä palvelemaan kehittäjien aikomuksista poikkeavia tarkoitusperiä. Algoritmeja voidaan ‘pelata’ eli manipuloida, tai käyttökontekstin ja järjestelmän toiminnan välille voi tulla epäsuhtia, joiden seurauksena järjestelmät saattavat toimia epätoivottavasti. Esimerkiksi suoratoistopalvelu voi tarjota epärelevantteja suosituksia käyttäjälle sen jälkeen, kun sitä on käytetty yhdessä ystävien kanssa. Kuka palvelee mitä tai kenen intressejä voi muuttua suhteessa algoritmisiin järjestelmiin, sillä yksilöt voivat käyttää palveluita muiden puolesta (Artikkeli III), tai värvätä algoritmeja edistämään omia intressejään. Koska algoritmit eivät havaitse

maailmaa samalla tavalla kuin ihmiset, niiden harhaanjohtaminen muuttamalla niille syötettyä informaatiota näyttää erilaiselta kuin pyrkimykset huijata ihmistä (Artikkeli II). Algoritmit eivät myöskään ymmärrä, jos niiden kohtaamisen kehys muuttuu esimerkiksi yksilön käyttämisestä tilanteeseen, jossa jokin ryhmä käyttää niitä (Artikkeli III).

Tämä väitöskirja havainnollistaa pelimetaforan hyödyllisyyttä sen tutkimisessa, miten algoritmisten järjestelmien merkityksiä ja rooleja määritellään ja uudelleenmääritellään vuorovaikutuksessa sekä ihmisten että järjestelmien kanssa. Tämän lisäksi pelimetaforan (ja erityisesti liikkeen käsitteen) yhdistäminen kehysanalyysiin korostaa, miten kehyksiä määritetään vuorovaikutuksessa. Tämä lähestymistapa toimii vastapainona näkemyksille, joissa kehysten ajatellaan olevan staattisia asioita, joita ihmiset löytävät maailmasta ja käyttävät maailman ymmärtämiseen. Väitöskirjan empiiriset ja käsitteelliset löydökset tarjoavat tapoja algoritmisten järjestelmien ymmärtämiseen osana päivittäistä elämäämme ja suhteitamme, joissa nämä järjestelmät saavat erilaisia merkityksiä riippuen tilanteista, joissa niitä kohdataan.

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If I think about my dissertation project through the journey metaphor, it is rather difficult to pinpoint the precise moment of embarkation. When the University of Helsinki granted me the official status of a doctoral student, in 2017, I had already been working for some time at the Helsinki Institute for Information Technology on topics related to my thesis, and one could look further back in time still – the first article behind the dissertation is based on my master's thesis, which I submitted in 2013. Perhaps I received the ticket for this journey even further back in time, when we were taught methodology in the second year of my bachelor's studies. That sparked my interest in doing research. While pinpointing any single starting point to this journey would be tricky and might even be impossible, there is a clear finish line for it: printing the dissertation you are now reading and defending it (successfully, I hope). Clearer than the path's endpoints, however, is that this has been a journey not of solitude but of relationships. Thus it is that, as a journey with somewhat muddled beginnings approaches its end, the time has arrived to thank my fellow passengers – those with whom I have had meaningful encounters along the way.

A dissertation project is not an endeavour one can complete alone. My deepest gratitude goes to my supervisors, Senior University Lecturer Kari Mikko Vesala and Associate Professor Airi Lampinen. It is thanks to Kari's guidance that I have begun to understand relational theorising in social psychology somewhat and learnt how to apply it in research. From our discussions in the course of this process, I have discovered more than can be described here. Often the conversations lingered in my mind long afterward: more than once as I was working on my research, I experienced an epiphany after considerable time had passed since one of our meetings: 'Oh, this is probably what Kari meant back then!' Airi has patiently guided me ever since my master's-thesis days and given me much more support than one could expect from a supervisor. I doubt I would have ended up tackling this dissertation at all without your encouragement and support, let alone finishing it. Thank you for believing in me. This work has been much easier for me also on account of the opportunity to refer to your expertise and your experiences with the intricacies of being a social scientist interested in information technology. Your sense of what it means for someone with this background to participate in discussions in the field of human–computer interaction has been invaluable. I sincerely thank both of you for offering me the chance to grow as a researcher, along with the support needed along the way. Also, while not supervising my dissertation project, Adjunct Professor Marko Turpeinen has kindly kept our interdisciplinary research group under his wing at Aalto University even though much of our research has not necessarily been in line with what is traditionally expected of a department of computer science –

although the topics our group has focused on have been gradually growing more prominent in that world too.

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I thank my family for being there for me always. For nearly my entire life, my siblings Kaisla and Niko have had the joy of experiencing the peculiarities of my temperament and have reminded me, when this has been necessary, that I am not always correct about everything. My mother, Maaret, besides having given me literally everything, has always emphasised the importance of education. This journey takes me almost as far as I can go on that front. As for my father, Markku, I wonder what you might say if you were here with us today.

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Helsinki, 17 March 2022
Jesse Haapoja

CONTENTS

LIST OF ORIGINAL PUBLICATIONS

This dissertation incorporates research reported upon in three publications. All are included in the form in which they were originally published. These consist of the following pieces:

I Haapoja, J., & Lampinen, A. (2018). 'Datafied' Reading: Framing Behavioral Data and Algorithmic News Recommendations. In *Proceedings of the 10th Nordic Conference on Human–Computer Interaction* (pp. 125–136). ACM. https://doi.org/10.1145/3240167.3240194

II Haapoja, J., Laaksonen, S.-M., & Lampinen, A. (2020). Gaming Algorithmic Hate-Speech Detection: Stakes, Parties, and Moves. *Social Media + Society*, *6*(2), 1–10. https://doi.org/10.1177/2056305120924778

III Haapoja, J., Lampinen, A., & Vesala, K. M. (2021). Personalised Services in Social Situations: Principal–Agent Relationships in Account Sharing. *Proceedings of the ACM on Human–Computer Interaction*, *4*(CSCW3), Article 219. https://doi.org/10.1145/3432918

The publications are referenced in the text by the above Roman numerals.

1 INTRODUCTION

Some years ago while I was browsing online with my partner, an advertisement popped up at the side of the screen for a sports watch I had planned on getting her as a Christmas present. I had been retargeted by an algorithm after having looked at the watch earlier in an online shop. I faced a dilemma: I felt that saving the surprise element of the present required me to act naturally, so that my partner would not pay attention to the advertisement, but at the same time I had to do something to make the advertisement disappear. In this situation, I felt as if I were suddenly trapped in a game that could have real negative consequences for me, however minor.

This example illustrates how **algorithms**, as part of a host of digital applications, have crept into our lives and relationships in both mundane and surprising ways. The way in which algorithms have come to matter throughout life has attracted social scientists' interest and the attention of the general public to the notion of what algorithms are and how they are used in various services, such as social-media and video-streaming applications (Burrell & Fourcade, 2021). While the textbook definition of an algorithm simply states that it is a sequence of steps used to transform an input into an output (Cormen et al., 2009, p. 5), the wide world of applications of these computational techniques has brought the term from computer science to the domain of the social sciences. As Seaver (2019b) has stated, we deal with **algorithmic systems**, interconnected combinations of elements such as data, code, and people, rather than only algorithms. Associated discussion spans topics from the social power of algorithms – manifested, for instance, in their choice of the media we encounter (e.g., Beer, 2017) – to discrimination and injustice that algorithms can perpetuate in decisions on matters such as housing (e.g., Eubanks, 2018). The debate brings in larger ethics questions related to algorithms, including issues such as unfair outcomes and inscrutability (e.g., Ananny, 2016; Mittelstadt et al., 2016). Furthermore, research has examined the general role of algorithms in day-to-day life in the form of common services such as search engines and recommender systems (Willson, 2017). The influx of interest in these processes resonates with their increasing presence in the everyday. These systems affect our relationships with our friends (Eslami et al., 2015), choices of date partners (Courtois & Timmermans, 2018; Wang, 2020), and what information we receive from search engines such as Google (Gillespie, 2014) or from news-recommender systems (Article I; Norberg-Schultz Hagen et al., 2020; Thurman et al., 2019). They do so by mediating and moderating connections between people of various stripes and the content we encounter online.

It is not uncommon for people to have something at stake when interacting with algorithms. Often, it could be said that we are playing games with them. When the game metaphor has been operationalised in these situations, it is

often referred to as 'gaming the system': actors trying to outright manipulate these systems in ways unintended by their creators (e.g., Bambauer & Zarsky, 2018; Christin, 2017; Wang, 2020). One example is the case in which artist Simon Weckert deceived Google Maps into concluding that traffic was massively congested by placing 99 mobile phones in a trolley in the road. Humans could easily see that something other than a traffic jam was taking place (Weckert, 2020).

The concept of the game is useful in a far broader sense than merely referring to manipulations, however (e.g., Article II; Cotter, 2018; Swedberg, 2001). For the dissertation project, I applied it as a general metaphor for studying encounters with algorithmic systems. Here, the game metaphor encompasses attempts to game the system but is not limited to these. Another important aspect of this treatment is its focus on the game as a process rather than an artefact. My project delved into how a game comes to life as actors begin their moves, not solely the physical settings of the game. It is not the game board I set out to study but, rather, the process of playing – of which it is an integral part.

The foundation my research is built upon is Erving Goffman's work on games, especially as laid out in his book *Strategic Interaction* (Goffman, 1969) and the essay 'Fun in Games' (Goffman, 1972). I supplemented the game approach with the concept of a frame as used by Goffman in his *Frame Analysis* (Goffman, 1986). Adopting a relational perspective (e.g., Emirbayer, 1997; Niska, 2015; Vesala, 2022) afforded study of how the various elements in relationships that are present in encounters with algorithmic systems become defined through the lens of a game metaphor.

As the orientation above already hints, the project did not apply **game theory** in the sense often visible in, for example, the field of economics. Echoing Goffman's way of using metaphors (e.g., Goffman, 1959b), I took the metaphor of the game as a starting point and developed a model from there to serve as a tool in my analysis. The metaphor functions here as an ordering device with which I not only focus on calculation but employ the notion of games in a broader sense to understand situations wherein algorithmic systems are present.

This dissertation is a compilation thesis. It comprises three peer-reviewed articles and this summary introduction. Article I focuses on how algorithmic systems can be used to create new games (in metaphorical terms); Article II discusses the stakes, moves, and parties involved in games; and Article III revolves around principal–agent relationships, conceptualised in game terms as party–player relations in the context of the dissertation. Taken together, this research output answers the following question: **if we treat encounters with algorithmic systems as games, what can we learn of those situations?** Metaphors highlight some aspects and hide others (e.g., Lakoff & Johnson, 2008, p. 10). What, then, do we learn when we focus on the elements that the game metaphor highlights? Addressing this question demonstrates that the algorithms are not the same in all situations. Rather,

they get different meanings when part of different games – and the same is true for the roles of humans.

Taking a relational approach entails anchoring the dissertation project in an assumption that one cannot understand a game in isolation from the actions and participants in it. At the same time, the participants' roles and actions are defined in the process of the game. The game metaphor offers a perspective from which humans are actors who make choices in particular situations but without those choices providing any guarantee of positive outcomes. While games have players who possess agency in relation to the situation in which they find themselves, those players are not all-powerful – the situation and other actors not only afford but also limit their actions. This perspective draws attention to several key aspects of specific situations: actions, or moves, that somehow alter the frame in which the activities are taking place (influencing the nature of the subsequent new, or altered, frame); how information may be strategically controlled; and who is playing for whom or what in particular situations.

1.1 ALGORITHMIC SYSTEMS AS THE OBJECT OF STUDY

The emphasis of this dissertation is on a micro-level empirical approach to algorithmic systems, as opposed to macro-level and more theoretical approaches. Focus is on encounters that unfold with or around algorithmic systems. This dissertation offers one way of answering Kitchin's (2017) call for studies that analyse how algorithms act in the world and are designed, in hopes of understanding our encounters with them.

For this project, my interest lay in algorithmic systems that are able to perceive individuals or, more precisely, traces of behaviour left by individuals, with said data then being used to generate certain outcomes in keeping with what the system has been built to classify as relevant (e.g., Gillespie, 2014; Seaver, 2019b). 'Perception' is used here as an illustrative term: I am aware that computers do not see but compute (Cheney-Lippold, 2018, p. 17), and in some respects it might be more suitable to discuss how they register and process things. After all, they do not have a human perceptual system; they operate from their own logic: for example, 'taste', something not inherently clear to a computer, may be a represented for a recommender system by data collected from the user's consumption habits (Seaver, 2019b). In addition, arguably even in humans it is the person who sees, not the human eyes (Hanson, 1958, p. 6). Nonetheless, the metaphor of perception is used in this dissertation, to highlight that people think about what their actions 'look like' to algorithms when they consider what consequences their actions might have. Admittedly, using this term is a stylistic choice too.

The framework applied here is suitable also for situations that lack a computer-algorithm component; however, it sheds particular light on

situations that do. The algorithms discussed in this dissertation are incapable of perceiving changing frames of activities. These systems cannot see whether someone is using his or her music-streaming account in solitude, at a social gathering, or with offspring, and so they cannot tell whether the song choices necessarily reflect the account-owner's tastes (an issue addressed in Article III). Examples of this sort demonstrate how reframing actions may be especially consequential when one is dealing with algorithmic systems.

In tackling such issues, the dissertation contributes to the fields of social psychology and human–computer interaction. For the former, it brings social interactions between individuals into focus, and it advances the latter by examining the presence of information technology in these interactions. The emphasis is on situations wherein algorithmic systems are bound up with human endeavours, rather than the systems' purely technological side.

1.2 THEORETICAL UNDERPINNINGS OF THE PROJECT

I adopted qualitative methods for studying engagements of various types between algorithmic systems and humans. The foundations of the methodology for the sub-studies were Goffman's (1986) frame analysis (discussed in articles I and III) and open coding strategies as discussed in grounded-theory literature (e.g., Charmaz, 2006) for all three articles. I also used Goffman's (1969) conceptualisation of the game as a heuristic device for data analysis (Article II).

While the theoretical background is discussed in more detail in Chapter 3, a brief introduction of the approach is in order here. 'Game' is a pervasive metaphor in Western cultures (Ching, 1993), with a long tradition within social scientific research (Goffman, 1969; Long, 1958; Swedberg, 2001). Metaphors highlight some aspects of phenomena and distort others (Lakoff & Johnson, 2008, p. 10; Morgan, 2006, pp. 4–6). For example, this lens may magnify calculation and distort routine actions. Overall, the benefit of metaphors is that they 'attend to fleeting resemblances between apparently disparate phenomena, [and] they incite us to make a cognitive leap which then appears to be both inspired and self-evident' (Manning, 1992, p. 145). In other words, they can demonstrate similarities between seemingly different situations. Encounters with algorithmic systems can be approached **as if** a game were being played even in situations that the participants do not approach as games (for a similar point related to approaching day-to-day life as rule-following, see Van Langenhove, 2010, p. 66).

At a glance, some situations are a more natural fit for the game metaphor than others. Lyman and Scott (1989) have stated that

> *A game may be said to be under way, then, when at least one actor in an encounter perceives a situation as problematic, estimates his or her own and others' construction of self and situation, and undertakes a*

> *line of action designed to achieve a goal or goals with respect to the situation*. (p.100)

Hence, the game perspective may be the most apt when actors have to make problematic decisions, decisions that Goffman defined as not involving a clearly 'right' option (Goffman, 1967, p. 163). However, play can become routinised in actual games (Tyack & Mekler, 2021), so the metaphor need not be restricted to thorny situations. Also, something can always be said to be at stake. An individual is always in some jeopardy, in that at least our bodies remain vulnerable, and situations may be linked in surprising ways such that our behaviour may have lasting but unforeseeable consequences (Goffman, 1967, p. 169). The stakes need not be high either: as the sports-watch case demonstrates, most of us probably can remember situations in which our losses or wins have not necessarily been large.

Wins and losses are part of games. This is tied to the matter of who or what individuals are playing for. The kinds of motivation that individuals cite for their behaviour may differ between people, and there is always some doubt as to whether the motives were as unambiguous or separate as the accounts portray. Still, people are able to give reasons for their behaviour, thus offering ways in which it can be understood (Harré, 1993, pp. 121–123; Lyman & Scott, 1989, pp. 112–132). For example, Article III addresses some reasons for sharing personalised services with others, such as pooling credentials to separate services for monetary reasons.

Losses too can vary widely. They run the gamut from potential embarrassment (Article III; Goffman, 1967, pp. 5–47) to attracting the attention of government officials (see Article II). In the essay 'Strategic Interaction' (1969), Goffman's imaginary protagonist, Harry, often finds his life at stake. While the everyday for us is less dramatic, one would hope, situations in which we feel we are in the midst of something that could have either positive or negative consequences for us, depending on our and others' actions, are part of life.

I use Goffman's work on frames to supplement the game metaphor. Frames serve as a way to organise the meanings individuals assign to any given situation and provide answers to a crucial question: 'What is it that's going on here?' (Goffman, 1986, pp. 8–10). I use this work to highlight games' capacity to function as activities that constitute and maintain certain frames and to be activities wherein the participants may modify these framings. For my purposes, frames are a secondary device relative to the game metaphor. I use them here to consider how the elements and actions within or in relation to the game should be understood (Deterding, 2013; Goffman, 1986).

The discussion encompasses moves made to affect what it is that is going on here and how that influence may be achieved by various means, such as using algorithmic systems or enrolling other actors in the game. Thus, a perspective that combines the game metaphor and frame analysis shifts the focus toward the processual nature of framing by approaching framing in

connection with games: how frames are sustained, transformed, or broken by particular moves.

Police forces in the United States offer a concrete example of how algorithmic systems can be applied to change the frame of a game-like situation. There are reports that some officers have started to play copyright-protected music while members of the public are filming them, apparently in aims of activating automated filters that block copyrighted material from view in services such as social-media platform Instagram in the event of upload (Thomas, 2021). This is an example of actors integrating new elements into a game, or using old elements in new ways, and taking advantage of the relationships within the game. Actions of this kind integrate a content-moderation protocol's expected reaction into a game. In this game, a song gains a meaning very different from how it generally is listened to. At the same time, these actions bring new players – content-moderation systems – into the situation at hand.

1.3 THE STUDIES CONDUCTED

For the work presented in the three peer-reviewed articles, two types of algorithmic system are central. One of these is recommender systems that personalise content for users. Dealt with in articles I and III, these systems generally are designed to predict users' preferences on the basis of content or other items they have consumed, viewed, or rated. The second is hate-speech-detection algorithms, which are part of a class of machine-learning methods in the umbrella category natural-language processing. While the latter are often relevant in the context of automated moderation of discussion fora and social media (Gillespie, 2018; Ruckenstein & Turunen, 2020), Article II examines one applied to political candidates' social-media behaviour by actors not affiliated with these platforms.

Article I considers perceptions that users and the main designer of the news-recommender system Scoopinion described having of the system. The discussion draws analytically from Goffman's frame analysis, introduced in his book by the same name (1986). A collaborative recommender system that functioned by comparing data between users, Scoopinion gathered information for purposes of generating personalised recommendations. The article illustrates how algorithmic systems may be used to transform meanings in pursuit of creating new activities, conceptualised in this dissertation as games.

Article II discusses a project wherein a hate-speech-detection model was developed to monitor the behaviour of political candidates during the Finnish 2017 municipal election season, alongside the negative reactions prompted by the monitoring and some proposed counter-moves. The study used Goffman's (1969) work on games as a heuristic device for analysis and demonstrates the game metaphor's applicability for study of interactions within and around

algorithmic systems, with a focus on the specific parties and moves in the game.

Finally, Article III discusses principal–agent relationships in relation to sharing of accounts for personalised services such as the content-streaming platforms Spotify, Netflix, and YouTube and the dating service Tinder. The discussion in the article builds on literature on principal–agent relationships (e.g., Meyer & Jepperson, 2000; Niska, 2015; Shapiro, 2005) and *Frame Analysis* (Goffman, 1986). The study focused on how personalised services may be set in social situations and how they may be shared with others. Here, the systems are, on one hand, part of the interaction in some situations and gathering data from it while, on the other hand, part of a relationship as a resource that can be shared with others. The paper elucidates how who is playing for whom – or what – may change rapidly with regard to algorithmic systems, alongside how these new use situations are separated from the wider unfolding reality.

2 ALGORITHMIC SYSTEMS FROM A RELATIONAL PERSPECTIVE

This chapter discusses and articulates what algorithms and algorithmic systems are, then provides an overview of prior research into people's day-to-day encounters with those systems. A vital aspect of this dissertation is examination of algorithms in a relational context – that is, taking into account that they are inseparable from other elements, such as humans (Seaver, 2019b) and data (Dourish, 2016).

2.1 ALGORITHMS AND ALGORITHMIC SYSTEMS

I begin with a textbook characterisation of algorithms. It is against this backdrop that I then identify divergences and variety that become visible when such technical systems are deployed amidst the everyday doings of individuals:

> *Informally, an algorithm is any well-defined computational procedure that takes some value, or set of values, as input and produces some value, or set of values, as output. An algorithm is thus a sequence of computational steps that transform the input into the output*. (Cormen et al., 2009, p. 5, as cited in Seaver, 2019b)

It is precisely to distinguish from narrow technical descriptions such as this that I employ the broader concept of algorithmic systems in this dissertation. Seaver (2019b) defined this class of system in the following way: 'It is not the algorithm, narrowly defined, that has sociocultural effects, but algorithmic systems – intricate, dynamic arrangements of people and code. Outside of textbooks, "algorithms" are almost always "algorithmic systems"' (pp. 418–419).

While algorithmic systems vary in their complexity, larger commercial systems such as Google and Facebook especially are extensively networked and constantly subject to change (Seaver, 2019b). These systems may be extremely complicated: an engineering manager from Facebook has claimed that 100,000 individual weights get applied in the model that produces their service's News Feed (McGee, 2016).

Algorithmic systems do not remain fixed over time. The systems we experience are not the same as time goes by, and the systems experienced are far from identical across all the people who engage with them (Bucher, 2018; Comber et al., 2019). They are constantly tinkered with. Users are subjected to directed A/B tests wherein the designers try out new features with a subset of the user base. Also, many of the algorithms that are of interest to social scientists nowadays either are recommender systems or apply some kind of

machine-learning techniques; therefore, the data used in the systems affect the outcomes (e.g., Burrell & Fourcade, 2021). Even if the algorithms deployed stay the same, our behaviour differs from others', as do our contacts in services such as social media. It follows that the content we experience is different from what the algorithms serve to others because of both our connections and personalisation. It is also thus the uniqueness of each life that causes us to experience differences in our encounters with and within algorithmic systems.

At the same time, anyone working with algorithmic systems should consider the associated obligations and what interests they serve. Usually, to serve their function and remain in place, they must generate a profit or be financially supported (Gillespie, 2014). Those behind the system design often encounter economic constraints to what their creation should do, and platform companies tend to optimise their algorithms to serve interests connected with the company's profit (Cotter et al., 2021).

Algorithmic systems may exert effects on relationships in other ways too. As Eslami et al. (2015) pointed out, individuals may make assumptions about their relationships with others in response to the information that social-media feeds hide or show to them: '[I]t may be that whenever a software developer in Menlo Park adjusts a parameter, someone somewhere wrongly starts to believe themselves to be unloved' (p. 161). In this setting, the systems do not merely mediate relationships between human beings; they may also moderate them (see also Markham, 2021). They might remind us about individuals we would rather forget or might slowly contribute to eroding our relationships with those we would prefer to stay in touch with.

2.2 DATAFICATION

No meaningful discussion of algorithmic systems can take place without encompassing data. As mentioned above, an algorithm uses inputs to produce outputs (Cormen et al., 2009). Recent years' burgeoning panoply of means by which social behaviour gets turned into measurable information has been called **datafication** (Flensburg & Lomborg, 2021; Mayer-Schönberger & Cukier, 2013; Van Dijck, 2014). Van Dijck defined this phenomenon as 'the transformation of social action into online quantified data, thus allowing for real-time tracking and predictive analysis' (2014, p. 198). Some examples of the processes of capturing our lives in measurable digital form are tracking how we act online (e.g., Article I; Lehtiniemi, 2020), attempts to turn online hate in social media into a measurable thing (Laaksonen et al., 2020), and various endeavours to quantify our health (Ruckenstein & Schüll, 2017). The increasingly commonplace practice of datafication has sparked considerable discussion about who has the right to use the data collected from individuals (Lehtiniemi, 2020; Lehtiniemi & Haapoja, 2019; Lehtiniemi & Ruckenstein, 2019).

Those creating algorithms dictate how these register the world. Turning events of the social world into data amenable to computation by algorithms requires interpretative, cultural work (Seaver, 2019b). Additionally, those wishing to capture our lived reality for algorithmic processing need to tackle questions of relevance: capturing a phenomenon requires deciding what data should be collected and how they should be used (Gillespie, 2014). While many aspects of life are increasingly datafied, algorithms are never able to perceive us 'wholly'. As Cheney-Lippold (2018) stated, '[t]he complexity of our individual histories cannot be losslessly translated into a neat, digital format' (p. 10).

In many situations, it is in the interest of individuals encountering algorithmic systems to try to influence the information that algorithms gather from them (Bambauer & Zarsky, 2018; Bucher, 2017; Burrell et al., 2019; Hardt et al., 2016). Sociology literature refers to this phenomenon as reactivity (Espeland & Sauder, 2007; Ziewitz, 2019). In metaphorical terms, people may try to affect what is visible to an algorithm in accordance with some assumption about how a given action influences the output generated by the system in question.

2.3 RECOMMENDER SYSTEMS AND PERSONALISATION

Recommender systems, as the name implies, are developed for recommending content via data, usually collected from the users during prior interactions (Berkovsky et al., 2008; Resnick & Varian, 1997; Schafer et al., 2007). Most recommender systems fall into one of three distinct categories: content-based recommenders, collaborative recommenders, and hybrid recommenders. Content-based systems base their recommendations on classes of content the user has consumed before, such as certain film genres. Systems classed as collaborative rely on information collected from other users, generating their recommendations in accordance with preferences expressed by people with similar consumption patterns. Finally, hybrid models are mixes of the two (Adomavicius & Tuzhilin, 2005).

Articles I and III focus on recommender systems, as does much of the research on social scientific studies of algorithmic systems (e.g., Alvarado et al., 2020; Prey, 2018; Seaver, 2019a; Siles et al., 2020). The reason these systems are of interest to social scientists is that they are built on personalisation – that is, tailoring content for individual users in an attempt to satisfy their tastes (Churchill, 2013). One would not be exaggerating if describing personalisation algorithms as practically ubiquitous in modern online services. This can be said to lead to a situation wherein no two people experience the same Internet or services (Comber et al., 2019). As Seaver (2019b) noted, 'personalization algorithms by definition alter one's experience according to interactions with the system' (p. 415). As recommender systems

filter material, it is usually impossible for users to know what was filtered out (Willson, 2013), what material they would have received in the absence of personalisation.

Churchill (2013) offered an idealised definition of the processes involved in personalisation, stating that usually 'there are three main phases of personalization: learning (explicit from profiles and intentional user-generated signals [e.g., "Like"s on Facebook] and implicit from transaction and activity trace data), matching, and recommendation' (pp. 12–13), with the difference between the last two being that the former refers to choosing what to recommend and the latter to the recommendation act in which the matching content is delivered to the user. In another distinction, Schulte (2016) distinguished personalisation from customisation by stating that customisation is reactive but personalisation is predictive: in customisation, the individual chooses one of the options, while personalisation coheres around the choice having already been predicted by the system.

Seaver (2019a) drew together discussion about recommendations' accuracy and roadblocks to progress in the field of predicting that accuracy. After advancing in leaps and bounds, the increase in accuracy has faltered, as the preferences of individuals are not completely stable. Recommender systems could, in theory, be perfect if, for example, one would always want to watch only certain types of films. Pointing to our preferences' situation-dependence, Seaver cited work by Amatriain et al. (2009) attesting that people presented with the same items may rate them differently at different times. While some recommender systems take contextual elements into account (e.g., Adomavicius et al., 2011), they are limited to modelling context as a construct that is somehow measurable, rather than defined in interaction (Dourish, 2004; Seaver, 2015).

From users' perspective, personalisation can be experienced as either unpleasant or pleasurable. This is largely situation-dependent. For instance, Ruckenstein and Granroth (2020) pointed out that, while targeted advertising can be disturbing, it may elicit positive emotions too, at moments when the user feels correctly seen by the market venue. The sense of whether a personalisation algorithm serves one's interests or not may differ greatly between situations.

2.4 AUTOMATED HATE-SPEECH DETECTION AS AN APPLICATION OF MACHINE LEARNING

Another important field of algorithm work for purposes of my project is hate-speech-detection models. One such model was the focus of study for Article II. To present models of this type, I must begin by stepping back and

introducing the concept of machine learning, to ensure sufficient background. This is not meant to be an exhaustive introduction to the topic[1].

The bulk of recent advances in algorithmic systems is attributable to techniques following the general rubric of machine learning. As more and more data are collected from day-to-day life (Van Dijck, 2014), the coupling of this accumulation with increases in computation power has produced great advances in machine-learning algorithms (e.g., Kitchin, 2014, pp. 102–104).

In machine learning, the algorithms are trained. While the technical details of particular types of machine-learning methods are beyond the scope of this dissertation, they can generally be categorised into supervised and unsupervised ones (e.g., Kitchin, 2014, pp. 102–104). Gillespie (2016) offered the following general description of supervised machine-learning methods:

> *Contemporary algorithms, especially those involved in some form of machine learning, are also 'trained' on a corpus of existing data. These data have been in some way certified, either by the designers or by past user practices: this photo is of a human face, this photo is not; this search result has been selected by many users in response to this query, this one has not. The algorithm is then run on these data so that it may 'learn' to pair queries and results found satisfactory in the past, or to distinguish images with faces from images without.* (p. 20)

Fundamentally, the process entails showing a model examples of what it is that one wants. Unsupervised methods, in contrast, do not supply the algorithm with pre-selected, marked classes such as faces as buckets for input data to be placed in. These methods operate instead by finding patterns in the raw data; the algorithm does this itself without anyone specifying predetermined categories (e.g., Kitchin, 2014, pp. 102–104).

The hate-speech-detection models considered in the doctoral research are systems that apply supervised learning. In essence, training these models consists of showing them examples of messages or speech labelled hateful and parallel content that is not considered hateful. The aim with this approach is to get the model to recognise later hateful speech itself, on the basis of the training data categorised by humans (e.g., Laaksonen et al., 2020).

2.5 ENCOUNTERS WITH ALGORITHMIC SYSTEMS

There are several positions an individual can occupy in relation to algorithmic systems. Generally, people interacting with information systems are referred as users. There are also non-users, with their own perceptions of the technology, though this term too is oriented toward only one direction of relationship with technology. Scholars in fields such as human–computer interaction have discussed alternative ways of considering those who are

[1] For one attempted definition for this field, see Mitchell (2006).

affected by technologies while not actually deciding to engage with them (e.g., Baumer & Brubaker, 2017; Baumer et al., 2015; Comber et al., 2019). For instance, the 'users' we talk about in relation to machine-learning algorithms participate in creating the model as the algorithms are trained with their data (e.g., Burrell & Fourcade, 2021). There are also those who build and design technologies, but I discuss them more from the perspective of engagement in creating positions from which users may act.

2.5.1 USERS AND ALGORITHMIC SYSTEMS

Prior research has explored, for example, how users describe their understandings of systems such as the social-network site Facebook (Eslami et al., 2015, 2016) or the music-streaming platform Spotify (Siles et al., 2020). Often, such studies' underpinnings have been operationalised in terms of folk theories (e.g., DeVito et al., 2017; Eslami et al., 2016; Siles et al., 2020) – that is, with regard to 'those non-authoritative conceptions of the world that develop among non-professionals and circulate informally' (Eslami et al., 2016, p. 2372).

People differ in their degree of knowledge of how algorithms affect their life in various situations and in their beliefs about this (Cotter & Reisdorf, 2020; Eslami et al., 2015; Gruber et al., 2021; Lomborg & Kapsch, 2020). For example, in a study by Swart (2021), many participants described algorithmic filtering as beyond their control, yet other research has witnessed participants discussing their active role in the news-personalisation process (Monzer et al., 2020). Other work has documented users reflecting on both, with attention to how companies' interests play in to the actions of algorithms: in a study by Alvarado et al. (2020), some participants brought up that it is in the financial interests of companies to keep users on their platforms.

For users, algorithmic systems are often so-called black boxes (Brevini & Pasquale, 2020; Pasquale, 2015) to at least some degree, in that how they function is often opaque (Burrell, 2016). However, users may engage in strategies of various sorts to gain more knowledge of the functioning of platform-specific algorithms (e.g., Cotter, 2018; Ramizo, 2021). For example, proceeding from extensive ethnography, Bishop (2019) described how beauty vloggers on YouTube, who earn a living from creating content, share their knowledge and experiences of the services' algorithmic functionality with others.

Even if they pay our way, our encounters with algorithms do not always serve our interests. They may create undesired and even hurtful connections by, for instance, reminding us of deceased loved ones (Bucher, 2017) or exposing us to upsetting social-media information about ex-partners (Pinter et al., 2019). Offering another example, Ananny (2011) discussed how the Google Play Store recommender system drew a connection between the Grindr application, described by its operators as 'the largest social networking app for gay, bi, trans, and queer people' (Grindr, n.d.), and an application titled 'Sex

Offender Search'. Thus, a simple nonsensical connection may equate minorities with criminals.

Prior research has also examined how users act against the planned use of technologies (Eglash, 2004; Oudshoorn & Pinch, 2003; Salovaara et al., 2011). Also, as designers try to develop design artefacts that configure users by limiting such opportunities (Woolgar, 1990), those who design technology are simultaneously configured by users, employers, etc. (Mackay et al., 2000). This is not to say that the technologies' design intent is irrelevant; rather, it does not **dictate** how those encountering some technology interact with it.

2.5.2 STRATEGIC USE OF ALGORITHMIC SYSTEMS

How individuals make themselves or their actions visible or non-visible for algorithms often proves crucial with regard to interactions with these systems. This is especially evident in social media, where users often try to manage the visibility that the service gives their content. Cotter (2018) discussed how 'influencers' with the social-media platform Instagram strive to maximise their overall visibility and the host of strategies they apply to obtain knowledge of how to increase said visibility. These strategies can be said to focus on making one's actions algorithmically recognisable, in Gillespie's (2017) terms; see also the work of Burrell et al. (2019) and Kim et al. (2021). That is, the strategist attempts to make the content more relevant by taking advantage of the algorithm's logic. Also, various types of systems can be used to control expressions conveyed to other users: Uski and Lampinen (2016) discussed how automated sharing of one's music-listening data has been used as a tool for impression management. Humans who thus translate their behaviour into a form more readily understandable by computers must, at the same time, reorganise their activities to support computers, rather than rely on the computers to support what they are trying to accomplish (e.g., Burrell & Fourcade, 2021).

Managing visibility sometimes entails efforts to limit visibility of one's content or control who may access it (e.g., Burrell et al., 2019; Kim et al., 2021; van der Nagel, 2018). Van der Nagel (2018) cited the example of the act of 'Voldemorting', which received its moniker from the Harry Potter book series (e.g., Rowling, 1997). This is a set of tactics wherein users of social media avoid certain terms in their discussion. Via circumlocutions, they keep their posts out of reach to individuals who use those terms in searches online. In a similar vein, Gerrard (2018) discussed tactics for circumventing moderation designed to block pro-eating-disorder content: for example, to avoid hashtag-based moderation, users omitted hashtags while the posts themselves remained viewable to others. These actions require some sense of what the algorithms are coded to deem relevant and what they can see (Bucher, 2017).

2.5.3 LOOKING BEYOND USERS: NON-USERS AND USEES

As already noted, 'user' is not necessarily the best term to cover all individuals affected by technology. In 2003, Wyatt asked whether everyone's choices end up affected by the Internet whether or not he or she uses it, posing the analogy of how those who do not drive a car are nevertheless affected by car-centricity of infrastructure. The same question could be asked about algorithms, and one could argue that the answer is 'yes'. Those not using certain services may still be affected in various ways by their algorithms (e.g., Comber et al., 2019). More thorough consideration of non-users in the design process could yield a technology that better accommodates them (Wyatt, 2003).

My description above alludes to types of relations to technology that may exist beyond the 'user'/'non-user' dimension. Baumer (2015) coined the term 'usees' to denote those who neither use technology directly nor are purely non-users. These individuals are used **by** the technology or are targeted by actions of people who use it. He cited as an example women who, having used the location-based service Foursquare to pinpoint their location at places such as bars, were involuntarily swept up in a service used to monitor females in one's vicinity via Foursquare data. The women were not users of this service, but calling them non-users is not exactly suitable either.

3 THEORETICAL BACKGROUND

I used Goffman's work on games (1969, 1972) and frames (1986) as the backbone for my theoretical framework. This was supplemented by literature on principals and the agents serving them (e.g., Meyer & Jepperson, 2000; Shapiro, 2005). I approached this work through Goffman's conceptualisation of parties and of the players who play on behalf of those parties.

There are multiple ways of interpreting Goffman's work (e.g., Manning, 1992, p. 2). Here, I follow a relational reading (e.g., Niska, 2015) that steers the focus toward such matters as how interactions sustain and create certain frames. This is not the only way of understanding Goffman (for a structuralist approach, see, for instance, Gonos, 1977). Some scholars have identified postmodern underpinnings to his writings in that they can be viewed as emphasising that no essential self is to be found: individuals can be seen as different persons if acting in different roles. Yet he also noted that we resist what others say we should be (Lock & Strong, 2010, p. 204). What is clear across all interpretations is that Goffman stressed the micro-level interactions between individuals in particular situations (e.g., Goffman, 1959b, 1983). His approach to games does not deviate from this general pattern.

Accordingly, anyone taking Goffman's work as theoretical background should bear in mind that it deals mainly with aspects other than people's inner self (Williams, 1998). The following extract captures this focus well:

> *I assume that the proper study of interaction is not the individual and his psychology, but rather the syntactical relations among the acts of different persons mutually present to one another [...]. What minimal model of the actor is needed if we are to wind him up, stick him in amongst his fellows, and have an orderly traffic of behavior emerge? [...] Not, then, men and their moments. Rather moments and their men.* (Goffman, 1967, pp. 2–3)

In a similar vein, I do not venture to make claims about any human's internal life. Rather, I confine my gaze to humans' encounters with algorithmic systems.

Again, while the game metaphor forms the conceptual foundation for my theoretical approach, complementing it with the concept of frames draws attention to moves that are used to create and uphold particular definitions of situations. Each of these descriptions of what is going on here may be more advantageous for some participants in the interactions than for others.

3.1 METAPHORS AS TOOLS FOR RESEARCH

Leary (1990) stated that 'all knowledge is ultimately rooted in metaphorical (or analogical) modes of perception and thought' (p. 2). He noted that even Darwin's classical evolution theory is rooted in a metaphor: natural selection. Nature does not itself 'select' anything. Likewise, the social sciences are replete with metaphorical approaches. In one telling example, a look at the history of the Chicago school of sociology shows that metaphors have played an important role in research following this tradition. Its early work borrowed from ecology and evolutionary biology (Star, 1996). Goffman (1971) himself used the concept of territory in some of his work. In the social-psychology domain, Harré (1993) has discussed metaphors not as mere aids to description but as models for research. For example, we can approach social action as drama or as work (pp. 146–185).

We can approach a phenomenon for study via multiple metaphors (Morgan, 2006), with Wyatt (2021) illustrating how each metaphor used by researchers to discuss the Internet highlights a particular aspect of it. The library metaphor accentuates the Internet's status as a repository of data or knowledge, while the idea of the Internet as a frontier is evocative of libertarian ideals under which adventurers mould their own future.

Similarly, researchers have called upon several metaphors when discussing algorithmic systems. For sensemaking purposes, scholars have conceptualised these systems by means of such metaphors as bureaucracies (Alkhatib & Bernstein, 2019; Pääkkönen et al., 2020), recipes (e.g., Bucher, 2018, p. 19), black boxes (Brevini & Pasquale, 2020; Pasquale, 2015), and even traps (Seaver, 2019a). I do not claim the game metaphor to be better, or worse, than any of the other metaphors applied in studies of algorithmic systems. Rather, I have picked that of the game since it guides one's attention to moves played with or against others and to the consequentiality of choosing between moves. This makes the agency of individual actors visible in the situation they face while at the same time highlighting the role of interactions among actors and of the constraints of the situation. In other words, in contrast against many other approaches, that of the game metaphor presupposes individuals to be capable of making choices that have consequences for them but does not claim their agency is all-encompassing.

3.2 GOFFMAN'S APPROACH TO GAMES

Goffman often discussed the calculative aspects of the everyday, even when he was not writing about games especially (Geertz, 1980; Goffman, 1959b). Against this background, the fact that he employed the game metaphor explicitly too is hardly surprising. Geertz (1980) even went so far as to claim that the theatre metaphor Goffman applied in his best-known work (Goffman, 1959b) fits something more akin to a game. While this statement may paint a

rather simplistic picture of Goffman's oeuvre (Manning, 1992, p. 58), Goffman's writing elsewhere does delve into games. Manning (1992, p. 56), who has written extensively on Goffman, highlights nicely that Goffman's *Encounters* (1972) (or, rather, the essay 'Fun in Games' therein) and *Strategic Interaction* (1969) worked both with and against the 'grain' of the game metaphor, showcasing the metaphor's absurdity and utility alike. His work in this area inspired others. For instance, in *A Sociology of the Absurd* (1989), Lyman and Scott extend great credit to Goffman for their view of the game metaphor, in that 'it seems that a game model is most suited for the analysis of interaction as our conception of the game model derives from the conception of a goal-seeking, voluntaristic, intentional actor' (p. 4).

Goffman's most notable contribution to the use of games as a model for interaction, the above-mentioned book *Strategic Interaction* (1969), consists of two essays. 'Expression Games' revolves around various moves that one can make to manage visibility and what others may reasonably infer about one. Expression games are about 'the individual's capacity to acquire, reveal, and conceal information' (Goffman, 1969, p. 4). Secondly, the essay sharing its name with the book, 'Strategic Interaction', looks squarely at the game model beyond expressions. The sections below unpick various aspects of this work that are important in relation to the dissertation project.

3.2.1 MOVES AND RULES

Goffman conceptualised moves in games as 'a course of action which involves real physical consequences in the external world' (1969, p. 90). Moves thus alter the situation for game participants, and those engaged in games are interested not only in the moves they can make but also in what moves are available to other players (p. 94).

What the game metaphor highlights in this connection is that our choices, or moves, have consequences. This consequentiality of choosing from among options for actions, or moves, is accentuated in Goffman's work on **fatefulness** (1967, p. 163), a variable aspect of the decisions taken in games. Decisions, according to Goffman, can be **problematic** and/or **consequential**, with a decision that falls into both categories being described as **fateful**. Purely problematic decisions are those that, while involving no obvious correct choice, do not exert long-term effects on the individual's larger life. An example is a decision on whether to 'kill time' by watching television vs. reading a magazine; this decision might cause someone to ponder a bit but is not necessarily consequential (Goffman, 1967, p. 163) (some problematic decisions may be revealed to be consequential later on). A consequential decision that is not problematic is one in which the 'right answer' should be obvious: a decision not to go to work is consequential since the worker who makes the wrong choice could end up unemployed, but it is not problematic, as the correct course of action is clear. Yet the point here is that choices

between courses of action have consequences, some minor and others far greater.

While the players in overt games usually stand in some mutual agreement about the rules, this is not necessarily true for encounters with algorithmic systems (e.g., Cotter, 2018) or in life in general. For instance, while platform-designers want to settle on rules for their users to follow (Petre et al., 2019), disagreement about rules may give rise to conflict, thereby spawning a new game.

3.2.2 PARTIES AND PLAYERS

While Goffman discussed diverse roles that actors may play in games, such as **tokens** (1969, p. 87) marking the positions occupied or **informants** (1969, p. 88) providing insights to others, the most central roles are those of a **party** and a **player** in the game. Parties are those whose interests are relevant for the game, and players' role is to act on these interests. While an actor may fulfil both roles, this is not always the case (Goffman, 1969, p. 86). We may align ourselves with others' interests or negotiate with others to define common interests upon which to act. In essence, the party–player relationship is a principal and an agent's relation, as, for example, discussed in agency theory. Here, the principals are those on whose interests the agents (should) act (Shapiro, 2005).

Players all have to decide on for whom or what they play (Goffman, 1969, p. 91) – i.e., choose their principal (Meyer & Jepperson, 2000). Who or what we are playing for is fundamental to what it means for us to win or lose and, thereby, to how we play. Themes of individuals acting on another's behalf run through other writings by Goffman also. For instance, in *The Presentation of Self in Everyday Life* (1959b, p. 11), he discusses how doctors may tell lies in pursuit of a patient's interests.

Principal–agent relationships have been discussed in several fields. Perhaps the most well-known research tradition focusing on said relationships is **agency theory**. This approach, centred on potential goal conflicts between principals and agents, is more prevalent in the field of economics than other social sciences; however, situations of someone acting for another exist in all of life (Shapiro, 2005). Relations between principals and agents hold clear relevance beyond economics. In social psychology, Darley (1995) has noted that the classic Milgram obedience experiment (Milgram, 1963), demonstrating that ordinary people under the influence of authority may be induced to harm innocent others, can be seen as articulating a principal–agent relationship. One may understand the experiment as a situation in which a subject who thought he or she was harming another human was acting at the behest of the experimenter as an agent thereof. Particular fields have used slightly different words for the various relationships between principals and agents. For example, Bandura (2001), with a background in psychology rather

than economics, used the notion of proxy agency to refer to people's capability of having others act on their behalf. Still, the central ideas 'rhyme'.

As noted above, the core dilemma in principal–agent relationships as addressed by agency theory is goal conflicts. Agents' personal interests may be at odds with those of the principal, and they may serve multiple principals at the same time. Niska (2015, pp. 33–34) has summarised the criticism levelled at the original formulation of agency theory thus: it has largely disregarded that agents may be team players or altruists rather than seeking to maximise their own gains (Perrow, 1986). In addition, the roles of principal and agent are not set in stone but relational and situational: actors may even be principals and agents at the same time (Shapiro, 2005). The answer to the question of who is playing for what may, therefore, be quite complicated in any given situation.

Meyer and Jepperson (2000) have stressed actors' ability to choose from a wide array of principals to serve at any given time. They may pick, choose, and switch principals in very short order. Also noteworthy is that these principals need not be other humans. We are capable of selecting from among principals in several classes, such as individuals, organisations, and even convictions – not to mention ourselves.

As Seaver (2018) has pointed out, technology is usually developed to serve certain ends, with individuals, in turn, sometimes trying to bend the technology into alignment with their goals:

> *There is no independent software domain from which computers send forth their agents to insinuate themselves into our cultural worlds. Like any other technology, algorithms can produce unanticipated results or prove challenging to manipulate, but they have no wicked autonomy. […] [T]hese devices work at the pleasure of people who can change them, turn them off, or reorient them toward other goals*. (p. 379)

On this basis, algorithms can be conceptualised as players (but not parties, since they have no interests that could be served[2]). They can hence be considered agents in principal–agent relationships. Goffman (1969) did, in fact, remark that individuals must try to factor in the perspectives of non-humans in game-like situations if those perspectives are relevant. When discussing a player in classes of problematic scenarios that do not include humans, Goffman stated that the player 'must put himself in the situation of the fire, a plane or a lion as much as his knowledge and human limitations allow' (1969, p. 94). This can be likened to adopting the perspective of an

[2] From the perspective of Meyer and Jepperson (2000) algorithms could be regarded as principals, as they focus on actors' capability of taking on principals to serve. As mentioned above, these principals need not be humans. Some researchers point to users' efforts to 'please the algorithm' as connected with reaching their own goals (e.g., Klug et al., 2021; Lischka, 2021). This relationship is similar to agents serving principals for a reward.

algorithm. If one takes the stance that algorithms may be approached as players rather than just as passive props in a game, one can regard their inner workings as their style of play and their set of potential moves. Both are of interest for the other players (Goffman, 1969, p. 95), since identifying them renders others' actions more predictable.

3.2.3 EXPRESSION GAMES

A special category of games discussed in *Strategic Interaction* (Goffman, 1969) is expression games. These pertain to individuals' capacity to reveal, acquire, and hide information. I find them relevant in that users' interactions with algorithmic systems are at their most basic level about revealing information to these systems or hiding it from them. Goffman stated that, though one can abstract an expression game from every game, expression games should be 'considered also as one component, and a variable one, of something more inclusive, a game concerning objective courses of action' (1969, p. 145). Games are not only about expressions.

The concept of expression games shifts the attention to certain aspects of interaction. In any encounter with an individual, an expression is available to the observer, whether intentionally communicated or not (it is in many respects this intentionality and the ability to use signs that distinguish humans from other species). Also, the way information is communicated generates certain expressions in itself; Goffman put it thus: 'The least the communicating can express is that the sender has the capacity and apparently the willingness to communicate' (1969, pp. 7–8). Accordingly, the style of communication too may emit expressions: if one is familiar with another's manner of communication, it is often easier to determine whether that person is joking or not. These 'meta' levels of communication are often invisible to algorithms. Additionally, individuals interpret expressions of others to try to predict what is going to happen, yet they can also alter the expressions they display in an attempt to affect the behaviour of others. The example of 'tricking' Google into interpreting a cluster of multiple phones in a single place as a traffic jam illustrates fabrication of expressions specifically for algorithmic systems.

Goffman broke expression games down into several basic moves. Each move consists of either actions in which the observed and observer act naturally or ones whereby the observed and the observer are somehow trying to outwit each other. While discussing all of his move categories in detail is beyond the scope of this dissertation, the ones operationalised in Article II should be introduced here. These are **naïve moves** (Goffman, 1969, p. 11), a notion applied in situations wherein the observed is assumed to be acting naturally, and **control moves** (Goffman, 1969), a concept 'used to refer to the intentional effort of an informant to produce expressions that he thinks will improve his situation if they are gleaned by the observer' (p. 12). Many of the attempts by users of various services to control their algorithms can be

mapped to these two classes. The system is considered naïve in the sense that it does not know someone is acting reactively – that is, trying to manipulate it (although services such as the Google search engine do update their systems to counter attempts at artificially boosting pages' position in the search results). On the other hand, those who switch strategy from 'acting naturally' to feeding the algorithms information tailored for maximising their gains can be seen as engaging in control moves.

3.3 FRAME ANALYSIS

In Goffman's conceptualisation of frames (1986, pp. 8–10), they serve as a way to organise the meanings that individuals assign to any given situation. His statement that frames provide answers to the question 'what is it that is going on here?' means that we interpret activities by situating them in frames. Frames offer definitions of the situations we are engaged in or otherwise encounter. He referred to Bateson's example (1956 as cited in Goffman, 1986, p. 40) of otters play-fighting. The framing here includes meta-communication about the activity whereby the participants do not understand it as 'real' fighting, even if it looks the same.

While Goffman most notably discussed frame analysis in his book by the same name, I draw from his earlier essay 'Fun in Games' (1972) also. Though the essay applies the metaphor of worlds and world creation, I refer to frames in this connection too, for the sake of clarity. The similarity in themes between the two works is strong enough for justifying this (Manning, 1992, pp. 120–121). My approach to frame analysis ties in with the work on games that is discussed above by calling attention to how particular moves may change or support certain framings.

Persson (2018, p. 50) explained frames by pointing to how a thing that on the surface looks the same as another can be totally different from it; e.g., one may be in earnest and the other for fun. Without frames, people do not understand what they observe. While some interpretations of *Frame Analysis* emphasise cognition because Goffman did describe frames as 'schemata of interpretation' (1986, p. 21), he also stated that frames incorporate both participants' responses and the world they are responding to (1986, p. 85). This implies that frames are relational. My approach is built on this relational definition.

Goffman (1986, pp. 21–40) divided frames into two core classes: natural and social frameworks. In natural frameworks, no agent with will is present. Rainfall is one event in this class. Social frameworks, on the other hand, refer to activities that involve actors with intention. Opening an umbrella to avoid getting wet would be 'guided doing' and, as such, would be situated in the world of social frameworks. While Goffman situated the very broad categories of social and natural as 'primary frameworks', he did not clarify that concept and later admitted that the idea of a primary framework had not been

adequately developed in the book, which says nothing about the range of these frameworks (Manning, 1992, p. 132).

From an analytical angle, Goffman stated that frames are used to study 'strips' of activity (1986, p. 10). These can be understood as arbitrary slices that have been cut from the ongoing stream of activities humans engage in (Goffman, 1986, p. 10; Manning, 1992, p. 132). As we go about day-to-day life, frames of the activities in which we participate change. Some definitions of a situation are set to the side as new situations arise (Goffman, 1986, p. 85) – for example, when two men finish a game played in a moment of leisure and return to work. Frames may even come to a violent end, as in cases of an emergency forcing the players to stop their game of chess.

Hence, moving from one frame to another can be seen as processual. Additionally, frames can be nested. Lock and Strong (2010, p. 209) pointed out that a professional–client frame may hold more specific frames within it, such as a doctor–patient one. In the everyday, frames are thus layered within other frames, any of which may get replaced by different frames (e.g., Buscariolli & Vesala, 2021).

Frames also define individuals' role in the situation. In this vein, Gonos (1977) characterised frames thus: 'They represent a potential world that answers all questions about what it is that shall be taken by participants as real, and how it is that they should be involved in this reality' (p. 860). Via frames, we can locate our situation-specific roles and those of other humans. Similar thinking is expressed in 'Fun in Games':

> *Games, then, are world-building activities. I want to suggest that serious activities have this quality too. We are ready to see that there is no world outside the various playings of a game that quite corresponds to the game-generated reality, but we have been less willing to see that the various instances of a serious encounter generate a world of meanings that is exclusive to it. It is only around a small table that one can show coolness in poker or the capacity to be bluffed out of a pair of aces; but, similarly, it is only on the road that the roles of motorist and pedestrian take on full meaning, and it is only among persons avowedly joined in a state of talk that we can learn something of the meaning of half-concealed inattentiveness or relative frequency of times each individual talks.* (Goffman, 1972, p. 26)

Frames, then, define one's role in the situation and the meanings of the actions one carries out within it.

The relevant frame of the situation limits some actions and renders others possible (Niska, 2015). The same is true of any technology integrated into the situation or otherwise present. Even what the technology affords (e.g., Bucher & Helmond, 2017; Gibson, 1977; Hutchby, 2001) needs to make sense in the use situation (Lanamäki et al., 2016). While the benches on a bus afford standing on them, rare are the situations wherein it would make sense to use

them for standing, much less situations in which the social norms allow such behaviour.

Individuals may have different understandings of the frame of activity they are engaging in. Sometimes this is by design: someone may intentionally mislead others or, in Goffman's (1986, p. 84) terminology, fabricate frames in pursuit of such objectives as personal gain or practical jokes. The concept of fabrications already attests to how individuals may, with their actions, affect and create frames, not just recognise them. Fabrications is a concept that fairly nicely characterises those situations in which individuals attempt to manipulate algorithmic systems, as these situations usually are such that an algorithm maintains a faulty 'assumption' about what the situation is. The divergent understandings may stem, alternatively, from differences of perspective: one person's horseplay may be another's vandalism (Goffman, 1986, pp. 321–322). This too holds relevance for algorithmic systems, in that ideas of what should be framed as gaming the system may differ from one platform to the next and among users (Petre et al., 2019), and how a system is perceived depends on one's position also (Raita, 2012). Information-technology research has used the lens of frames to study, for example, how information/communication technologies such as e-mail or social media may be framed differently between a work and non-work context. Specific platforms or general techniques may be associated more strongly with one's job or with life outside the workplace (Treem et al., 2015).

3.3.1 KEYING

To turn the discussion toward how frames may be transformed, I utilise the concept of **keying**. A key, in this context, refers to a 'set of conventions by which a given activity, one already meaningful in terms of some primary framework, is transformed into something patterned on this activity but seen by the participants to be something quite else' (Goffman, 1986, p. 41). Keyings, therefore, are ways of transforming frames into activities whose meanings differ from the original.

While Goffman offered several distinctive classes of keyings, **technical redoings** and **regroundings** (1986, pp. 40–82) are especially interesting in the context of this dissertation. Turning some activities into data so that algorithms can perceive and act on them may be regarded as technical redoing in its own right, since documentation of activities can be considered a keying. Technical redoing, then, refers to redoing an activity (an act that may take any of various forms, such as documentation or demonstration) for purposes differing from the original performance's. Regroundings, on the other hand, offer a way to think about algorithms' incapability of perceiving reframings. In a regrounding, some activity is performed with a motivation that deviates from the primary frame. Goffman offered the example of '[a] woodsman's labor undertaken as recreation' (1986, p. 75). If someone plays music from someone else's Spotify account with the intention of influencing the recommendations

the account-owner receives (see Article III), the act of playing music is regrounded. The service, meanwhile, does not understand the reframing. This keying can be viewed as fabrication, since not all parties to the situation have an accurate view of what is going on. My use of the notions of keying and fabrication differs slightly from Goffman's original conceptualisation. In his view, keying leads to all participants sharing the same view of what is going on while fabrications require differences in their views. Recognising the analytical strength of the idea behind keying, I chose to adopt an approach wherein fabrication activities can encompass keyings. Thereby, I can obtain value from the concept of keying even when examining a situation that features aspects of fabrication – i.e., one in which not everyone is aware of the keying.

3.3.2 BRACKETS

Goffman called the borders of frames **brackets**. His use of this term (1986, pp. 251–252) refers to the spatial and temporal markers that indicate where each frame of activity begins and ends. For instance, the closing of the curtains at the end of a play onstage acts as a spatial and temporal bracket terminating the frame of the play.

Brackets can be understood as the edges of a game board in some respects, or differentiating between when one is and is not engaging in a game. However, frames are not completely isolated from one another. Situations, or games, are linked in the wider, ongoing reality by multiple elements that continue to exist, in whatever form, after a given situation has ended. As Goffman pointed out (1986, p. 287), wood exists even after burning, turning into smoke.

Another aspect of the boundaries is that individuals can bring resources into frames and adapt them to be relevant for the situation at hand (Di Filippo, 2017). These may get new meanings when adjusted to fit the new frame. Di Filippo (2017) offered the example of how a book series can be used to craft a world for a video game. Thus, this conceptualisation shows that individuals have agency to transform frames by integrating various resources into them, with that integration always entailing a need to fit them into the frame.

3.3.3 TECHNOLOGICAL FRAMES

The concept of frames has been employed in the study of technology before. In Bijker's (1995) conceptualisation, a technological frame 'comprises all elements that influence the interactions within relevant social groups and lead to the attribution of meanings to technical artifacts and thus to constituting technology' (p. 123). Another well-known example application is Orlikowski and Gash's (1994) conceptualisation of technological frames of reference. As for the difference between the two stances, Davidson and Pai (2004) have stated that 'Orlikowski and Gash's frame concept is strictly socio-cognitive and does not include the technology artifact, whereas Bijker includes cognitive,

social, and material elements' (p. 476). My way of operationalising Goffman's approach to frames for this dissertation has more in common with Bijker's version. I see the material world as an important part of the frame. Goffman (1986, p. 85) himself stated that frames incorporate both the world and a correct reading of it. In line with these descriptions, my understanding of frames marks them out as relational. Highlighting the relational nature of frames, Bijker (1995) stated:

> *A technological frame structures the interactions among the actors of a relevant social group. Thus it is not an individual's characteristic, nor a characteristic of systems or institutions; technological frames are located between actors, not in actors or above actors.* (p. 123)

That said, distinctions do exist between Goffman's conceptualisation of frames and that of Bijker. Goffman discussed activities (or situations) rather than technology. Likewise, I am interested in frames of activities that algorithmic systems are part of, rather than the framings of the technology. This does entail considering frames of technology too; after all, as Goffman noted (1986, p. 82), frames are nested, so they can contain frames of specific technologies as parts of the activity. A further distinction follows from this focus: I am interested also in how these activities may be reframed or keyed in different situations and in how the meanings of technology may change as interactions unfold.

3.3.4 A RELATIONAL PERSPECTIVE ON FRAMES AND GAMES

At this juncture, with the general ideas of games and frames both introduced, I should elaborate on the link between the two, since that connection opens the path to my interpretation of frames as relational, defined in interactions. This way of interpreting Goffman's work bears similarities to those labelling him as a symbolic interactionist, as this approach emphasises how meanings are defined in interaction (Jacobsen, 2017). In *Frame Analysis*, Goffman cites games as examples of framed activities, among others, but here I tie the concept more tightly with the game as a metaphor – that is, considering social life as a game. This way of reading Goffman is afforded also by his other work: Manning (1992, pp. 120–121) has noted that Goffman's 'Fun in Games' can be read as a description of how individuals, via various moves, uphold certain frames of activity. Similar themes are visible in earlier works by Goffman. *The Presentation of Self in Everyday Life* (Goffman, 1959b) includes discussion of how individuals try to act so as to convey a definition of a situation that is suitable for them. The concept of expression games discussed above can be approached similarly through the idea of framing. Strategic ways of controlling information are acts of framing, and we can understand attempts to gain information as endeavours to reveal whether there is some important unidentified frame that one is unaware of. Furthermore, when addressing the

capacity to frame situations in such a way that the agent influences how others should understand the situation, Buscariolli and Vesala (2021) used the concept of 'agency over', referring to agency in how others perceive and understand certain actions.

This way of approaching frames accentuates the active nature of framing and upholding frames. While *Frame Analysis* can be read from a structuralist perspective (e.g., Gonos, 1977), where frames are seen as more stagnant things for individuals to recognise and apply, in this dissertation I apply a relational approach to frames. In contrast to a structuralist approach, my work emphasises individuals' agency and micro-level interactions (see Fuchs, 2001). I wish to focus on how actors make particular moves to uphold or alter the frames. Even something as structured as a football match requires players to adhere to rules and act in a certain way lest the frame of the game collapse. While a frame of 'football game' exists in a socially shared form in many (if not most) human societies, it is still something that has to be enacted and achieved through interaction, rather than something that just exists in the world, ready to be identified. And life generally is much less structured than football. I see frames, then, as something achieved, resisted, and changed through moves of various sorts in games. When a frame changes, the game may change too.

4 THE RESEARCH APPROACH AND ETHICS CONSIDERATIONS

I took a relational approach to the research itself (Emirbayer, 1997; Niska, 2015; Vesala, 2022), in which the analysis and data collection for all of the component articles applied interpretative qualitative methods. This type of methodology provided the advantage of affording a more open-ended approach than, for example, quantitative questionnaires would have. Thereby, it facilitated studying how the encounters with algorithmic systems are constructed in particular contexts.

Because my interest lay not in a particular algorithm in a specific situation but in a set of encounters with quite distinct systems, I used various data-collection methods and sources, to capture various perspectives on systems (e.g., Seaver, 2017). For the empirical studies behind this dissertation, I collected material for the research from diverse sources. The data-collection techniques used include conducting interviews, collecting online discussions, and gathering written accounts from participants. The articles describe the relevant research materials in more detail.

4.1 THE RESEARCH APPROACH

From a relational standpoint, rather than considering the encounters studied in the articles as consisting of stable, separate entities, I view them as situations wherein meanings are adjusted and defined in interaction processes (Burr, 2015; Emirbayer, 1997; Niska, 2015; Vesala, 2022). In this, I follow Vesala (2022) and Emirbayer (1997), who drew on Dewey and Bentley's description of a relational approach to the social sciences (1949). In an approach of this nature, 'persons, whether strategic or norm following, are inseparable from the transactional contexts within which they are embedded' (Emirbayer, 1997, p. 288). In relational research, the researcher adopts an alignment with the world from which he or she expects to pinpoint relationships and processes that make things seem as they do, rather than looking for entities with any fixed nature as noted by Vesala (2022), who illustrated this with an example borrowed from Dewey and Bentley, of a transaction between a salesperson and a customer. That transaction defines the parties as a salesperson and a customer, and it is what makes the product sold into something that **can** be sold. There is no need to assume any of these categories to be fixed – they are defined and are assigned their meaning in the encounter's relationships. From this perspective, algorithmic systems and the people/entities encountering them are defined in the situational relationships and gain their meaning from these.

'Relational' characterises my choice of methodology and my data collection also. Scholars have argued that qualitative methods aid in avoiding decontextualisation of participants' accounts (e.g., Burr, 2015, p. 170), so they can be seen as lending themselves to the study of processes, as described above. In my use of qualitative materials, from interview to social-media data, I attempted to capture how algorithmic systems became defined in particular encounters and by particular actors. In other words, the relational perspective that I operationalised did not involve asking about some essence of technologies or their users or assuming that they have some kind of unchanging nature. Instead, my operationalisation entailed seeing technologies and individuals as situation-specific, defined in interaction. Furthermore, technology is not inevitable but created by humans to serve a certain purpose – the technology could always be something different (e.g., Burr, 2018).

4.2 ETHICS CONSIDERATIONS AND THE RESULTS' TRUSTWORTHINESS

I, as a researcher, bring my own subjectivity into the studies, and I am aware that someone else might have obtained different results from the same research materials (Burr, 2015, p. 172; Charmaz, 2006, p. 10). Even the collection of the data was guided by my subjective interests to some extent. In fact, the studies themselves can be understood as ways of framing certain situations or, more precisely, keying them by producing something that is based on the happenings or on participants' descriptions of events as reported by me and co-authors (Goffman, 1986, pp. 69–70).

Research participants' accounts do not necessarily mirror their internal attitudes or reflect events precisely as they occurred (Burr, 2015, pp. 147–151). In all of the studies, at least some of the research material was collected either via interviews (for articles I and II) or otherwise from participants' own descriptions of certain events (written accounts for Article III). While analysis aids in detecting common themes or topics across the body of research material and, thereby, helps to pinpoint similarities in the ways of describing some activities, it should nevertheless be kept in mind that I examined only one version of reality, which is based on how individuals described particular events. The study setting for Article II was somewhat different, in that the source material included online discussion in conjunction with interviews and one of the authors participated in creating the hate-speech-detection model that the study revolved around. However, this still reflects just one version of reality, the one elicited in the study, and the events could have looked different from another perspective.

I strove to be sensitive to the above-mentioned issues in the handling of the research material. Also, I aimed specifically to ensure the participants' anonymity and treat their contributions in confidence. Informed consent was

received from them all, apart from those posting the publicly available discussion posts collected from an online forum (discussed immediately below). Anonymity did present difficulties in some cases, however, and there was one actual exception. The latter arose during the preparation of Article I: after discussion with the main designer of Scoopinion, he decided to forgo anonymity because it would have been trivial to ascertain his identity on account of the smallness of the team behind the system. Still, neither the interview nor the article revealed any sensitive information about the designer. As for the other anonymity issues, those familiar with the case examined in Article II would be able to identify at least the government organisation participating, who had openly stated in news media that they were involved in creating a hate-speech-monitoring model as a part of their attempts to monitor and curb hate speech in the run-up to the municipal elections. Additionally, locating the online forum from which the comments were collected could be trivial for many Finnish readers, since it is a well-known one. A sufficiently motivated reader might even be able to unearth the original message threads. However, the messages in question have been publicly available from the outset. Also, since the article presents the extracts in translation, search queries based on the English-language excerpts do not lead to the original messages.

5 FINDINGS

The thesis is based on research presented in three peer-reviewed articles. They are all jointly authored publications for which I acted as the first (and corresponding) author and contributed the majority of the work that went into the writing. With this chapter, I outline the results of the sub-studies with regard to answering the question of **what can be learnt if we look at the encounters with algorithmic systems examined in these studies through a game metaphor**. I chose this perspective specifically to highlight the ways in which those encountering algorithmic systems are active agents in relation to the systems while, at the same time, not forgetting that the systems and decisions behind their creation are important factors. Additionally, this perspective sheds light on these diverse encounters' relational nature in that how their distinct elements (actors and others) come to be defined is game-specific, through the actions taken in the game.

When read as a coherent body of work, the three articles highlight the following aspects of encounters with algorithmic systems: what frame the interactions in the encounter with an algorithmic system generates, how resources are used in crafting these frames, what moves are made in relation to the frame of the situation, how they create positions for other participants, and for whose interests the moves of play are made.

The language applied in this synthesis chapter may differ from that in the constituent articles, as they vary in how explicitly they articulate the idea of a game. Below, I discuss the findings presented in each of the articles, in turn, and then provide an integrative account that joins the game metaphor and frame analysis together as analytical lenses. In situating the work as a whole, my concluding synthesis addresses the research in terms of theoretical approaches that were not explicit in, or fitting for, all of the original articles, for reasons such as length limitations, analytical clarity, and the cumulative nature of the research.

5.1 ARTICLE 1: ALGORITHMIC SYSTEMS IN MOVES FOR CHANGING FRAMES OF ACTIVITIES – WHAT THE GAME IS ABOUT AND WHAT MAKES IT UP

Article I is a report on a qualitative study conducted with Airi Lampinen. The study focused on the news-recommender system Scoopinion, which tracked reading time spent on news Web sites via a browser add-on and created personalised recommendation for users by means of said data (additionally, it tracked clicks from the various Web sites and newsletters, but its emphasis was on reading time). Data were gathered from interviews with 10 early users (conducted in summer 2012) and the lead designer of Scoopinion (later, in

April 2017, after the system had been withdrawn from use). Methodologically the study applied open coding as used in, for example, grounded theory (Charmaz, 2006; Strauss & Corbin, 1997) and drew conceptual insight from Goffman's frame analysis.

This article highlights how algorithmic systems can be used to create new frames of activities by transforming meanings – in this case, the meaning of reading. Using the game-metaphor language of this dissertation, one can regard Scoopinion as having been employed to create a new game, with creation of this game itself being part of a relational process that built on existing meanings and, in the course of doing so, overlaid replacement meanings on them. Approaching the activity of engaging with Scoopinion as a game allows interpreting the interactions between the users and the system (or its designers) as moves, with which various actors attempt to reach certain goals and serve certain interests. It is through these moves that the frame of using a system such as Scoopinion is created and upheld.

One element accentuating the fact that the game is not static but dynamic is that Scoopinion had developed from a service similar to those we consider social media nowadays. In that earlier form, users could visit each other's profile to see what fellow users had read. At the time of the user interviews, it was no longer possible to visit other users' profiles. This change in itself can be seen as a move in a game, wherein the game was reconstructed such that the moves available to users changed. It also points to the value of this dissertation's processual perspective to the game metaphor. From such a standpoint, one can identify moves made in multitudinous processes that define and redefine the game.

5.1.1 READING AS MAKING MOVES

Scoopinion reframed the act of reading by datafying it, thus transforming the act into one that can be understood as recommendation in the context of interacting with the system. Approaching this process through Goffman's concept of keying, with special emphasis on the idea of technical redoing (as discussed in Subsection 3.3.1), we conceptualised the datafication process as a keying of the act of reading. In the interviews with users of the system, longer reading times were interpreted as a sign that the content read was of higher quality. Highlighting the relational nature of the interaction between users and the service, reading within that interaction became defined as evaluation. While reading might very well have been understood as something else outside its borders, the participants echoed the way the service marketed itself, overall. This indicates that the framing offered by the service was successful, at least among the participants in the study. With these elements, the service constructed a world that for purposes of the doctoral research I regard as a game.

The users framed Scoopinion as something that can be understood as implicitly social. The team behind it marketed it to users as a way to tap in to

evaluations provided by others' reading, and the users interviewed accepted this framing so extensively that the lead designer, when presented with results from the user interviews, deemed the branding to have succeeded. Here, users discussed the service as social in the sense that it drew a connection to behaviour of others. Thus, reading became a move with which one interacted with other users and the service.

5.1.2 THE MEANING BEHIND MOVES IN THE GAME

The team behind the service used the process of datafication to craft a suggested way for users to experience its use, one wherein they could benefit from the reading behaviour of others. The lead designer pointed out that some design features, such as timers, had been implemented in efforts to ensure that it was reading that was captured, rather than someone merely leaving a Web page open or attempts to artificially increase some articles' popularity in the service. In other words, precautions were in place to counter gaming of the system and, thereby, promote conformance with 'correct' ways of using the service – in other words, to counteract potential attempts by users to reframe the game in a manner not desired by the company behind the service.

This is not to say that critical remarks about the service were entirely absent. Some participants did raise the issue of the system not understanding the context of the reading. An article being difficult to read could protract reading times, or some articles might be read because one's work requires this. Thus, users discussed ways in which the system could label their moves in the wrong way; that is, they identified potential for discrepancies between how the system perceives a move and how it should be understood from the user's perspective.

The lead designer mentioned another important element: there was a certain societal interest behind the service's logic. Through its reading-time metric, it was biased toward recommending longer rather than short pieces. This was intentional, as there were hopes that the system would recommend articles that offer the users deeper analysis. The development team saw this both as resisting the trend toward click-based online journalism and as giving users tools for becoming more informed, which, in turn, should prove beneficial for society at large. In the interview, the designer framed Scoopinion as playing on behalf of society's greater good. This societal ethos is also one link between the game and the surrounding evolving reality.

5.2 ARTICLE II: DEPLOYING A HATE-SPEECH-DETECTION MODEL FROM A GAME PERSPECTIVE – MOVES AND PARTIES

Article II presents another qualitative study. Co-authored with Salla-Maaria Laaksonen and Airi Lampinen, the article conceptualises creation and

deployment of a hate-speech-detection model as a move to counter potential hate speech of municipal-election candidates in social media (technical details of the model are available in Laaksonen et al., 2020). Additionally, the article examines strategies suggested for countering the model, as discussed by those who opposed the system and argued that its designers had no right to dictate what kind of language the candidates may use or to deploy the model to monitor this.

The study relied on data from several sources, gathered between the beginning of September 2017 and the end of March 2018. One of these consisted of interviews with representatives of stakeholder organisations that had been involved in developing a model for automated detection of hate speech from the 2017 Finnish municipal-election candidates' social-media profiles. Three representatives were interviewed, two from non-governmental organisations and one from the government entity involved. Additionally, the study presented in Article II used material expressing criticism of the project, posts collected from a Finland-based online discussion forum for immigration critics. The latter data consisted of 230 messages, gathered from two forum threads. In addition to these primary data, the study benefited from the insights of one of the article's authors, a participant in the model-development work.

5.2.1 THE GAME AND ITS PARTIES

The article describes a situation of a game played on several levels at the same time: on one level, humans play against humans; at another, humans play against technology. The game metaphor guided the authors to see that the game was not confined to the boundaries of the hate-speech-detection model – it also took place around the model. The study focused on context featuring multiple stakeholders, some of whom were contesting the legitimacy of the model developed and were pursuing conflicting aims.

The article illustrates a situation wherein an algorithm becomes defined as a threat by some and an ally by others. In the article, we define these groups as parties with clashing interests. A single technology was framed differently by different groups. Those responsible for deploying and developing it discussed it as acting to monitor political parties' adherence to an anti-racism agreement they all had signed. In discussion by critics, meanwhile, the model became defined instead as detrimental to freedom of speech, with parallels getting drawn to dystopian surveillance states of the sort familiar from George Orwell's novel *1984* (1949).

How these different parties formed was set within wider societal debate surrounding the concept of hate speech. While hate speech has raised concerns (e.g., Gagliardone et al., 2015; Matamoros-Fernández, 2017), the term itself remains contested. This contested nature played its part in fuelling disagreement about the legitimacy of the hate-speech-detection model deployed and of the need for it. The game played here, then, was part of a larger

societal process that had ramifications for how the parties involved became constructed in this particular game. With the article, we strove not to depict them as natural enemies but, rather, to show how they became opposing parties in this particular situation.

5.2.2 MOVES THAT DEFINE SITUATIONS

The hate-speech-detection algorithm was used to change the definition employed for candidates' use of social media. The goal set for the model was twofold: it was designed to collect information, thereby acting as an informant (Goffman, 1969, p. 88), and, secondly, it was applied to signal that the candidates were being monitored, thus also operating as a token (Goffman, 1969, p. 87). Publicly introducing the model to the 'game board' carried a message to the candidates: using hate speech in social media has just become riskier for them. In the above-mentioned nomenclature of expression games, this action can be seen as a control move designed to 'reveal as unmistakably as possible' (Goffman, 1969, p. 17) what was done.

The model's actions for monitoring candidates can be conceptualised as naïve moves, play carried out on the assumption that those subject to monitoring are acting naturally. This inflexibility and the model's inability to conceive of itself being duped left room for the model's opponents to speculate about strategies that could be considered control moves (Goffman, 1969). Critics mused about tailoring messages so as to be understood by humans but not by the model and about obfuscation designed to overwhelm the model with material it classifies as hate speech, which would then be forwarded for evaluation by a human. In other words, those critical of the system discussed moves to alter the model-perceived definition of the situation in a manner advantageous to them.

5.3 ARTICLE III: ALGORITHMIC SYSTEMS AND PRINCIPAL–AGENT RELATIONSHIPS – WHO PLAYS FOR WHOM

Examining the context of shared access to accounts with personalised services, the final article focuses on what are considered party–player relationships from the game-metaphor angle (referred to in the article by the synonymous term 'principal–agent relationships'). The article demonstrates how who is playing for whom may change in encounters with algorithmic systems, sometimes very rapidly, and that the consequences of these changes span a wide spectrum. The article was co-authored with Airi Lampinen and Kari Mikko Vesala. We gathered written accounts of various situations of sharing personalised services. The collection of data, from university students during classes and via an online form circulated via social media, took place between November 2019 and May 2020. There were, in all, 43 written accounts

collected. The services mentioned most were Tinder (21 mentions) and the media-streaming platforms Spotify (16 mentions) and Netflix (25 mentions).

The article characterises the principal–agent relationship from two angles. Firstly, sharing one's service use with someone else can be seen as a favour for the one with whom the access is shared, so the sharer can be regarded as an agent serving a principal. From another perspective, using someone else's account may occur at that person's behest; the user acts as an agent on the owner's behalf. In the dissertation's landscape, these principal–agent relationships all may be approached as regroundings (Goffman, 1986, p. 74), where the motivation for use differs from the typical use of one's account: use for one's own activities.

5.3.1 CONSEQUENTIALITY OF SHARING ACCOUNTS AND DEVICES

The sharing events connected with the various services ranged from playful to serious. When the situation could be deemed playful, the owner more often attempted to prune out its possible influence on future interactions. If a friend identified humour-oriented Tinder matches, the account's owner removed them more readily than when someone using the service on behalf of the account-owner had seriously attempted to find suitable matches, considering the account-owner's preferences and his or her long-term interests. The material showed variation with regard to the interests for which individuals were playing.

Encounters with personalised services can grow complicated if individuals act in ways that fly in the face of the general idea of personalisation. When they share their accounts with others, use them at another's behest, or engage with them as a member of a group rather than as an individual, consequences emerge. These kinds of relationships, in which other people may be incorporated into encounters between a recommender system and the individual user, confound the notion of a user that is implicit in many of today's technologies. Here, the users are not playing the game that the people developing the technology think they are playing or wish them to play. In other words, these systems and their users do not share the same frame: relative to the perspective of the users, the algorithms misframe the situation. Article III discusses one way of reframing the use of personalised systems: bringing them into a principal–agent relationship.

5.3.2 BRACKETS

Article III discusses brackets also, presented by Goffman (1986, pp. 251–252) as the spatial and temporal markers indicating where individual frames of activity begin and end. In the article, we suggest that services should consider equipping users with ways of bracketing certain time spans or episodes out of their data-collection – e.g., times when the service is used with others – to avoid problems such as irrelevant recommendations. Even with this

mechanism, brackets may be muddy in some cases: the data indicate that people used others' accounts even after the sharing ostensibly ended. Therefore, a service's account-owners might appreciate other facilities too, such as the option of setting up expiring passwords, which would afford easier limiting of sharing episodes.

5.4 SYNTHESIS OF FINDINGS

The stage is now set for synthesis wherein the findings from the three sub-studies are interpreted through a game metaphor. This is organised into four sections: The first discusses algorithmic systems and changing frames, with a focus on how definitions of situations are built and managed via moves in encounters. With the second, I examine how borders of individual games are defined. The third considers parties and players. Then, the final section deals with questions of visibility and relevance in interactions with algorithmic systems.

5.4.1 ALGORITHMIC SYSTEMS AND CHANGING FRAMES

I argue that algorithmic systems construct and change the frames that articulate what an activity is about. This does not entail moving agency from humans to machines: as mentioned already, these systems are always created by someone to serve certain ends. Nevertheless, once created, they have consequences for the people who encounter them in their daily doings. In game terms, algorithms are relevant with regard to determining what game the individuals are playing and what that game is about. Additionally, individuals may reframe the games that are in progress, bending the meaning of using an algorithmic system. However capable they may be of changing the game they are playing, they still are players in relation to it, so the situation they find themselves in has a bearing on what they are at that moment – if one is walking along the pavement, one is a pedestrian in relation to traffic, whether wanting to be or not. Similarly, one cannot be certain whether the consequences of creating algorithmic systems are those intended. I should stress also that I do not claim that players are all-powerful with regard to transforming the situations in which they find themselves; that is, I do not support the 'magical voluntarism' (e.g., Gunn & Cloud, 2010) perspective on agency.

My model considers the actions with which the frames are changed to be **moves**, of various types. This line of thinking shares similarities with Kolb's (2004) conceptualisation of **turns** in negotiation, which are units in which one challenges the position assigned to one by others' actions, thereby altering the situation. This definition can also mobilise Lyman and Scott's (1989, pp. 100–101) point about the suitability of the game approach for considering situations that suddenly seem problematic: moves that render a situation

problematic, or novel, for some participants are among the elements of interest here.

The meanings of algorithmic systems may get changed rapidly in interactions between/among the encounter's participants. As stressed above, I consider the various actions that frame and reframe the situations to be moves in a game. The relational aspect of my approach suffuses the definition of a game: what constitutes a move depends on the game played, but, on the other hand, what the game is depends on the moves played. In some cases addressed in Article III, algorithmic systems came to be defined as tools for pranks. This changed their local meaning. In one example, a participant tried to 'teach' a music-streaming service (Spotify) to recommend music that the account-owner disliked, as a joke. Another example is using Tinder to engineer a match with someone who is not the account-owner's type. These framings of use activity express a contrast against what these two services were built to do: Tinder was designed to afford matches with people with whom, at the very least, the account-owner would want to interact (Tinder, 2021), and the Spotify case is at odds with a general objective for recommender systems – offering material that interests the user (e.g., Seaver, 2019a).

Articles I and II illustrate how algorithms (and services that employ them) can be used to change meanings of earlier activities, to create new settings via framing. How systems are designed and subsequently explained to those engaging with them are moves with an aim of establishing a certain frame. Deploying systems also often includes communication about how the technology should be understood[3].

As described in Article I, Scoopinion gave a new, alternative meaning to the act of reading by reframing it as implicit recommending. More generally, creating and deploying some technology can be understood as creating and transforming meanings for certain activities. This is consistent with descriptions of how games give new meanings to elements incorporated into them (Di Filippo, 2017; Goffman, 1972) and connected with them. In this setting, the frames that a technology creates for activities mean that some moves make sense only within that frame. The role of a Scoopinion user exists only in relation to said service, with the moves following suit, just as the roles of pedestrians and drivers exist only relative to traffic. Software in general creates worlds where certain roles and actions, or moves, become possible (e.g., Sicart, 2020).

After Scoopinion set the frame, it continued with moves that took place within that frame: offering recommendations, an activity supportive of the frame created. At the same time, users engaged in moves that created the data used to fuel the recommendations. Recognising that said data still had to be gathered and processed, we can view these actions as a move from

[3] That said, when some technology has gained widespread adoption in society, the shared frames related to it are clearer (e.g., Bijker, 1995), so there might be less need to explain what exactly it is **for**. For instance, companies seldom have to explain what television is.

Scoopinion's side. The generation and collection of data is a relational process, between the service and the user. Through this, maintaining the service entailed maintaining the frames: use of the service was not so much an offering from Scoopinion as an ongoing process in which stakeholders participated. This perspective lends itself to understanding many other services that rely on user data, although it may often consist less of participation and more of exploitation of personal data (e.g., Burrell & Fourcade, 2021).

Deployment of the hate-speech-detection model presented in Article II was a move made to reframe the use of social media for municipal-election candidates. Use was articulated as riskier when including language that could be interpreted as hate speech, on account of the machine-learning model's monitoring of communications. The counter-actions discussed by people critical of the system can be understood as moves taking place within the frame that the model's deployment established for the social-media activity. These moves (obfuscation etc.) would have made little sense had the model not been publicly activated to monitor social media. A transformation in frame occurred, whereby new actions made sense. They made sense not merely because new technology was present but also since the technology in question – the hate-speech-detection model – was serving an opposing party and thus acting as a player allied with that party. The game required it to be countered.

Players can bring new elements of several sorts to the game. For example, one can recruit others to act on one's behalf, as Article III attests. The case described in Article II also chronicles how various parties may strive to gather resources that they can bring into the game, at the same time changing it. Those implementing the model were a collection of people from a government organisation, non-governmental organisations, and a private firm with collaborating researchers from university projects. The party they formed brought widely different areas of expertise to the table. Additionally, further parties and further games may be brought in. In this case, the counter-strategies of those opposing the model were not directed at the technology and its weaknesses alone; they worked on a different level too, where they were played against the opposing party on a larger board. There was, for example, speculation about activating more official channels for potential intervention by parliament members sympathetic to the system opponents' views. This scenario did ultimately play out, with a parliament member delivering a written interpellation to the Finnish minister of justice about the system (since the government organisation participating was under his jurisdiction).

Also, individuals can reframe their relations with algorithmic systems, thus altering what the game is about. In Article III's examples of users sharing their accounts for personalised services, this sharing led to usage situations wherein agents were engaging with services in place of someone else. This can be approached through Goffman's (1986, p. 74) concept of regrounding: the

motivation for engaging in a given activity changed from the one generally thought to be the main motivator[4].

Algorithmic systems vary in their role(s) in defining what the game is about. Article I's Scoopinion can be most readily regarded as building certain activity that could be considered a new game with it, since the interaction were directly with Scoopinion even though the reading data were collected from interaction with other services – namely, news sites'. The hate-speech-detection model considered in Article II, deployed to monitor interactions in pre-existing social-media services, can be viewed as changing the frame of the game and the actions within it, but it was also deployed in an ongoing game in which hate speech already was relevant. With regard to the conceptualisation in which Cotter (2018) likens Instagram's algorithms to a game master deciding who gets what on the basis of users' actions, Scoopinion fits this description better than the hate-speech-detection model, which was a considerably different type of player built to act for a certain party.

Accordingly, I posit that algorithmic systems can be used either to build new games or to alter existing ones in some way. Their role depends on the relationships that the algorithms in question have to other elements, and its articulation from an analysis standpoint depends on one's views about what constitutes a game: For researchers considering a new social-media service, as an algorithmic system it may offer a new game for users who want to maximise their visibility (e.g., Cotter, 2018), yet they could also see it as a new player in an existing game in which services compete against each other. The way the system's role is constructed hinges on the distinct context that one chooses to consider. Thus, the perspective the researcher chooses has some bearing on how the situations seem to unfold and how their participants come to be described, as we can see multiple games being played at the same time (Long, 1958). Accordingly, also the choice of metaphor affects how a situation is later explained.

Prior relationships with algorithmic systems have implications for the meaning given to a 'move' within future encounters with those systems, even if the set of elements from which the game is crafted changes. For someone who engages with entertainment media mainly alone from his or her Netflix[5] profile, opening the profile interface to watch something when another person is present has the added meaning of revealing an algorithmic identity (Article III; Cheney-Lippold, 2018) in a sense, because the profile's content is personalised. One's relationship and history with algorithmic systems, then, have implications for the meanings that moves played in relation to them

[4] Alternatively, one could place playful use in the keying class of 'make-believe' in Goffman's (1986, p. 48) model, wherein the sharing would firstly be an act of regrounding, with playful use then constituting a further lamination of make-believe on top of this. For the sake of analytical clarity, however, I have chosen to focus on regroundings in this dissertation (see also Sicart, 2020).

[5] Netflix is only one of several popular video-streaming services for non-user-generated content. Other, similar platforms manifest the same issue.

obtain in the future, as the history with these services has a bearing on the individual's stakes in the games. This too demonstrates that games' definition is an ongoing relational process wherein neither the elements nor the game itself stays the same.

The foregoing discussion illustrates how an approach that integrates Goffman's work on games and frames can inform the study of encounters with algorithmic systems of diverse kinds. Moves function both to uphold and to transform frames; therefore, they have consequences for how the subsequent moves are to be understood, since the later moves too hinge on some relationship with the current frame of the situation. Even if the game stays the same, that is because it is sustained by moves.

5.4.2 BORDERS OF GAMES

Let us now consider the borders of games and how they are defined and redefined by the participants. The borders can be conceptualised as brackets of frames in the sense presented in Subsection 3.3.2: temporal and spatial markers that distinguish one frame from another, or a game from its surroundings. These borders separate the relationships that are meaningful in the current situation from those that are not, or they mark the domain within which the things entering the space receive game-specific meaning. With regard to meanings' mutability, there is some overlap with the functioning of moves that change the nature of the game, but paying attention to brackets affords a slightly different focus. Discussing these borders is especially important because the meanings that get transformed with moves are often local ones, meaningful in the current encounter. With the concept of brackets, we can consider where the spatial and temporal limits of the frame lie.

Article III explicitly addresses brackets. It illustrates how those engaging in encounters with algorithmic systems may temporally and physically bracket ways of using them from the stream of activities, into a separate frame, and may also disassemble these borders. From our data, the ways in which people shared access to their Tinder account and then either removed or kept the matches others had chosen for them serve as an example. These data show how the borders of the newly transformed frame are managed via decisions on what consequences are allowed to exit the frame and 'leak' into the one that could be deemed use by the individual.

This example highlights another aspect of bracketing also. Fellow Tinder users were unable to see whether the person they were engaging with was truly the user whose profile they were interacting with in the service or, instead, an agent of the profile-owner. They were physically bracketed out of a certain frame of use. Since communication in the service takes place in textual form, it does not easily reveal who is pushing the buttons. This observation carries an important general message: games with algorithmic systems may have consequences for individuals who do not seem to be part of them. In certain situations, they may be considered unwitting pawns (Goffman, 1969, p. 87)

who may experience consequences of a game they are not necessarily aware of. Frames are not completely cut off from the reality flowing outside them.

Sometimes on account of such factors, services may contain features to control brackets. With Scoopinion, a user could step out of the frame for a while by turning off the add-on's tracking of reading or by using an alternative browser without the add-on installed: in short, users could control the source of the system's perceptions about them. The interviewees for Article I did not find this necessary (in fact, many of them did not even have the add-on installed; they used the service primarily through the newsletter it offered, with newsletters being a quite typical way for a service to incorporate resources beyond its immediate borders into its strategies for integration into users' other routines). While the tracking in Scoopinion was made visible, people who use online services are not always so clearly aware of the identity of those they are interacting with, as services may track behaviour far beyond their 'home' Web site (e.g., Bucher & Helmond, 2017).

There is also bracketing on the spatial dimension, breaking game-relevant activities from the larger frame of the game. For example, the discussions and planning conducted by the party responsible for developing and deploying Article II's hate-speech-detection algorithm took place in fora that were not public: e-mail and private meetings. These activities can still be understood as parts of the larger game, however – activities aimed at preparing the move of creating and deploying the hate-speech-detection model. This offers a reminder that frames are often nested. Within the frame that constitutes the game are other frames, separated by brackets from the frame encompassing them. Managing these borders within the game may be crucial: controlling other parties' and players' access to information about oneself is often vital. A single game can proceed in several locations at once, and not all of the things that are relevant for the game include the algorithmic system as a participant or as a field. They may take place around it or very much removed from it.

Article II also offers evidence of expanding the borders of the game. Those critical of the hate-speech-detection project called upon politicians to challenge the right of the party behind the model to use such technology in this way. As noted above with regard to musing about strategies for potential intervention by sympathetic parliament members, these moves operated on a level where they were played against the opposing party in other settings, rather than against the technology itself.

When employing the game metaphor in line with my approach, one cannot afford to consider the games to have impenetrable borders. We should recognise that those engaging in the game play actively redraw the borders. Through this process, the moves with which the borders are drawn become part of the game. Such an understanding draws together the manner in which frames are created and established in interaction (considered in the previous subsection) with **where and when** the frames are. Discussing the brackets that separate frames spatially and temporally assists in identifying the borders. These borders are defined in interaction: who participates in an

encounter or a game is a result of some kind of negotiation, though one wherein disagreements are not rare – since we might not want to play but are forced to. The dovetailing of my concepts does not end there either, for the act of bracketing is a move in its own right too. While the walls of a room or the edges of a game board may act as brackets, decisions to use them as such are made by humans.

5.4.3 PARTIES AND PLAYERS

The question of who is playing for whom is vital for identifying the interests that are at play and what it means for each participant to win or lose. To this end, I focus on party–player relationships. Their importance in connection with this stems from the fact that the stakes (the meanings of winning or losing) depend on what and whom we are playing for. A relational perspective is pertinent here too: gains and losses are defined in relationships between, on one hand, various elements of the games and, on the other, what or whom they are played for.

Building on the approach whereby the hate-speech-detection model is conceptualised as a player for the party that created it (see Article II) and under which both humans and algorithms can act as agents or players for some principal (see Article III), we can regard the recommender algorithm of Scoopinion too (as presented in Article I) as a player. This opens avenues for examining who exactly this player is playing for, if indeed that player is acting for anyone specifically (see also Wise, 1998). This could, in turn, shed light on whether the players can be swayed to play for parties they were not meant/expected to serve. Both Scoopinion's lead designer and the users interviewed portrayed the system as playing for the users. For example, one interviewee characterised it as helping to 'filter' news for him. Recommender systems such as Scoopinion can in some situations be viewed as acting as informants (Goffman, 1969, p. 88) as they attempt to tailor content for the user. Also, the users who utilised the add-on to supply data from their reading behaviour were helping each other even if their incentive for using the tracker was to receive more relevant recommendations for themselves. If we consider the users and the company to be separate parties, we find their interests aligned well enough that the algorithm could be understood as an ally to everyone involved. Especially in contrast against the views expressed by those critical of the model dealt with in Article II, the data's generally positive descriptions of Scoopinion suggest that the interaction between the system and its users could be described as a co-operative game. Building on this, one could argue that, with all algorithmic systems, one can begin to identify several principals for which services can be seen as acting. Sometimes interests align well enough between parties that the algorithms are seen as fair, serving multiple principals (see Article I), but in other cases parties may find themselves in conflict and the algorithms may be viewed as representing something that is in conflict with one's own goals (see Article II).

In other cases, algorithms may be exploited to serve interests other than those intended by their creators. Much of the 'gaming the system' notion (e.g., Bambauer & Zarsky, 2018; Ziewitz, 2019) follows from this idea: some model is fed some information that benefits someone in a way not intended by those responsible for the creation and upkeep of the technology. A case in point from Article II is the obstruction technique envisioned by critics of the hate-speech-detection project: tweaking the messages so that the ones caught by the system's filter would be too numerous for the necessary double-checking by a human. Seemingly implicit to the discussion about the felt need to counter the model was the idea that the model represents an enemy or opponent, as noted above. Some resonance with Cotter's (2018) point about individuals finding ways to manoeuvre within the rules of algorithmic systems is visible. Attempts to figure out how to play the rules followed by the algorithmic model to one's advantage did not break the rules but reinterpret them to serve other interests.

If we accept, then, that algorithms may be conceptualised as (potentially untrustworthy) players for one's party, attempts to mitigate manipulation efforts (and to safeguard against other unwanted actions by the technology) can be seen as part of a game wherein the aim is to ensure the trustworthiness of the agent acting on one's behalf.

Human players may take it upon themselves to act for someone other than themselves or for some non-human thing. As is explicit in my presentation of theoretical background, these principals are not necessarily other actors; they can even be non-actors such as ideals[6] (Meyer & Jepperson, 2000). Among the variations are individuals enrolling someone else to perform system-facing actions on their behalf, interacting with a system in someone else's stead, and serving their own goals and others' simultaneously when using or sharing a system. Precisely which entity the players are playing for is highly volatile. It may change very rapidly, altering the nature of the game being played: when the principal changes, so does what it means to win or lose. The stakes, then, are defined within the relationships that constitute the game.

5.4.4 VISIBILITY AND RELEVANCE IN RELATION TO ALGORITHMIC SYSTEMS

A game-based approach to algorithmic systems brings to the fore how differently algorithms 'see' when compared to humans. In consequence of this difference, the endeavour of fabricating frames for algorithms differs from acts of deception directed at humans. Prior research has delved extensively into purposeful acts that people conduct in certain ways in aims of affecting

[6] While traditions exist in which the 'actor' concept extends beyond individuals, groups, or organisations (e.g., Latour, 2005), I apply a definition that dovetails with my emphasis and facilitates the discussion here.

particular algorithmic systems (e.g., Bambauer & Zarsky, 2018; Burrell et al., 2019; Cotter, 2018; Kim et al., 2021; Velkova & Kaun, 2019).

How one manages what one makes visible in the game depends on the position one holds in relation to the system. Before Scoopinion could track their reading time, users had to install the browser add-on for explicit tracking of their reading time. In other words, they made their reading visible to the system – that is, algorithmically recognisable (Gillespie, 2017). The latter definition of visibility is important. Only a few of the things accessible to algorithms exist for them, at least in the sense of being deemed relevant. Naturally, those who wish to track behaviour would prefer that the tracking succeed, and those who oppose such aims want to figure out how to make it fail (as Article II illustrates). The strategies pursued or planned in connection with either of these aims differ from those targeted at humans on account of the differences between algorithmic and human perception.

Visibility is especially important with regard to personalised systems, since they cannot perceive whether they are interacting in any given circumstances with the user for whom the service has been personalised or, instead, another individual or a group. These systems treat all the data gathered as originating from the account-owner, and this monolithic approach also entails revealing user-specific information to others who present themselves to it under the given identity. While Article III examines this phenomenon with regard to recommendations – what Netflix recommends to someone may be quite revealing – the overall issue is far more extensive, and prior research has documented various concerns that individuals express about personal-seeming technologies divulging information about them in sharing situations. For instance, Burrell (2010) discussed how individuals in rural Uganda who shared their mobile phones sometimes worried about what the phone might reveal about them. Her example of a businessman fearing that his competitors might obtain information about the sources of his merchandise is only the tip of the iceberg with regard to the many, varied ways in which individuals' privacy may be in jeopardy when they share devices and/or user accounts of various services.

When the activities wherein people engage with technology correspond with the frames that the design has set, one can make a stronger case that the data collected capture something authentic[7]. When the frames are altered from those expressed by the design, the game enters murky waters: moves that transform the frames may render many of the data irrelevant. A large proportion of the data may originate from someone other than the account-owner, or the dataset may be contaminated by cases of outright fabrication through attempts to game the system for one's own advantage. How the technology is built does not become irrelevant, of course – we cannot simply

[7] Although the representation for whose datafication these computational techniques are built is never exactly the same as the thing they are attempts to capture (e.g., Cheney-Lippold, 2018; Sicart, 2020).

decide that we can nourish ourselves by eating a concrete wall. Nevertheless, some leeway always exists for shifting the frames. There are always ways to engage with the world in a different way. The wall may not be food, but it need not be an obstacle. It could be a goal in a game of football, or meaning might be found in tearing it down: symbolically restoring the country it has divided. In a similar manner, we can act in ways wherein our visibility to algorithmic systems is altered in some manner. It may be used in surprising and even game-transforming ways.

6 DISCUSSION

My objective for this dissertation was to answer the question of what can be learnt if we conceptualise algorithmic systems as games. Firstly, an integrated approach to Goffman's work on games and frames highlights how games create certain frames as they are played. Secondly, it demonstrates that frames can be seen as interactional in the sense that they are upheld and transformed through moves. This is visible in the way children play: the internal logic of the encounter changes when one child declares to another that this pine cone suddenly is a car, and the entire situation has to be interpreted as one that supports that declaration. When applying this perspective to encounters with algorithmic systems, we can see that the things we call services are supported not just on one end, by those creating them. Their use contributes to actively sustaining them.

Furthermore, parties may differ in how they frame technologies, and the ways in which these are framed may influence how individuals act toward them. These actions may even feature outright manipulation. Such attempts to game the system can be seen as controlling the expressions supplied to algorithms in pursuit of one's goals. Additionally, while much of the work on frame analysis in the Goffmanian tradition has focused on the social aspects of frames, my work highlights, in addition, that the material world too (particularly as expressed in algorithms and related technologies) is important in manifestations of frames. After all, it is part of the 'world', which, in combination with the 'viewing' of it, constitutes a frame (Goffman, 1986, p. 85). The following discussion presents conclusions pertaining to elements of games and expressions in contexts involving algorithmic systems. I round out the discussion by elucidating some limitations of the work presented here, followed by associated avenues for future research, before presenting some final thoughts.

6.1 A RELATIONAL GAME-METAPHOR PERSPECTIVE ON ALGORITHMIC SYSTEMS

An integral element of the games discussed here is the actors' ability to reframe what the games are about. Hence, these games are often ones whose nature may change as moves are played out and new elements get incorporated into the game. Agency in these games entails not only being able to act in one's best interest in the situation at hand but also having an ability to reframe that situation; that is, there are not only moves that are made in the game but also ones that change it – yielding a perspective made possible by the integration of the game metaphor and the concept of frames. In some of the examples examined in the doctoral project's sub-studies, changes in the game were

accomplished by enrolling others, be they humans or algorithms, to act on one's behalf. At the same time, those others (in either category) may be untrustworthy, and the parties whose interests are at stake must consider and accept that risk. These reframings, which are always situated in interaction, also change the meaning that the algorithms have in the encounters.

Such cases illustrate that the nature of a game depends also on what kinds of resources can be integrated into the frame. The meanings that various things already have serve as a starting point, but these things may obtain new meanings, which hinge on the specific game in progress. From this perspective, one can view service-creators as having agency over the frame or the 'game' as they compile various resources and convey suggestions as to their preferred way of understanding and using the service – suggestions that may be supported by mechanisms such as marketing and other communication (see Article I), a code of conduct (Petre et al., 2019), and the way the services are designed and programmed (Sicart, 2020). Thus, the creators describe not merely what the service is but also what it means to use it and what being a user of the service should mean (Docherty, 2020). However, they cannot draw impermeable borders around the use, so users can – and will – integrate new elements into the frame. Cheney-Lippold (2018) made a similar point with regard to how bringing new elements to a relationship may alter it, in the context of some HP computers' face-recognition facility not recognising a black face: 'You might have previously been unrecognizable according to HP's facial-recognition algorithm, but after the purchase of a new office lamp, you now have a "face"' (p. 26).

Whenever we discuss algorithmic systems and people, we must consider the material (or digital) world. The sub-studies highlight a point made by Seaver (2017, 2019b) in this regard: algorithms are culture. For example, the work behind Article II demonstrates the fundamental role of negotiations (between the project's participants about what constitutes hate speech) and the existence of the key concept (hate speech) as a category distinct from other types of communicative acts. Without these, it would have been impossible to create a model to identify hate speech; neither would its actions in the world have made any sense to anyone.

As algorithms and automation often are mobilised in response to problems of scale, it is difficult to monitor their integrity: there are too many interactions for any one human to verify continued full correspondence between their intent and what unfolds. While one cannot say that algorithms have any loyalty, it can be said that they are sometimes bent to serve interests other than those intended by their creators. One striking example comes from Microsoft's Tay (Neff & Nagy, 2016), a 'bot' that the software giant released onto Twitter in aims of having it learn discussion from its ensuing interaction with users of that platform. It did not take long for some users to recognise the potential of this behaviour, and Tay was rapidly turned into a racist. Clearly, Microsoft lost this game when their player, the bot that was supposed to highlight the

company's expertise in artificial intelligence, turned out to be easily swayed to act in antisocial ways.

The question of what is going on here, or what exactly we take to be real at any given moment, is central to the idea of frames (Goffman, 1986). In the context of my research, my attention to games and frames was often centred on something beyond what individuals feel to be real and how the roles of specific systems play in to this reality: how things are made to **seem** real, or relevant, for particular algorithms. This resonates strongly with the overall lines of Goffman's work, in that he can be seen as a theorist of credibility (Manning, 2000). At the heart of strategic ways of engaging with various algorithmic systems is often an endeavour to be credible for these systems in some way by controlling the expressions we emit to them.

While the ability to control the expressions one sends out in relation to algorithmic systems is a source of agency in some cases, the systems' inability to understand shifts in framings when evaluating these expressions may cause issues for users, such as irrelevant recommendations (see Article III). This inflexibility (Alkhatib & Bernstein, 2019; Pääkkönen et al., 2020) has been approached through the idea of context-aware computing (e.g., Adomavicius et al., 2011), defined literally as computing designed to take context into consideration. This enterprise is far from simple, however, since context can be understood as interactional. That is, it is defined in interaction rather than in terms of stable things that can be quantified (Dourish, 2004; Seaver, 2015). Moves that are used to change the frame alter the context too, even if it continues to look the same physically. Therefore, if a technology is to be genuinely context-aware from this perspective, it should have the same background information possessed by the situation's human participants. Even this is problematic: the context is not necessarily uniform across the participants. The same situation may be framed very differently by different people (Goffman, 1986, pp. 321–322).

It follows that algorithmic systems may end up unable to perceive the correct frame for the activity they are monitoring, where 'correct' refers to the one that humans generally would consider the most applicable. As Ackerman (2000) famously observed already two decades ago, human social life is much more fluid and nuanced than what information systems are built, or able, to take into account. Hence, it is not enough to see; one also needs to understand, the latter being something that computers still cannot do. A frame's correct interpretation may be masked, however – either on purpose, as in the case of gaming the system, or in a side effect of us going about day-to-day life, in which we shift from frame to frame naturally. This consideration points us toward a criticism that Goffman (1969, p. 119) identified with regard to the game metaphor, one that is especially relevant with regard to algorithms. On the 'micro' level at least, it is often unclear from their standpoint what game they are taking part in or with whom they are playing. While Goffman was writing about humans, this is also precisely why the game metaphor is so often an appropriate lens for studying interactions with algorithms at this level.

Fabrication and other situations wherein individuals use systems with or at the behest of others produce new types of consequences, since the algorithms themselves are employed to create new types of connections between activities. For instance, the recommender system examined in Article I transformed the act of reading an article in solitude into an interactional move, one that could lead to consequences not only for oneself (in the form of recommendations offered in the future) but also for others (in the form of the recommendations that might be made for them). If the approach I have laid out in this dissertation does not matter, algorithms would not matter either.

6.2 LIMITATIONS

This dissertation's focus on micro-level encounters with algorithmic systems necessitated not delving into perspectives suited to tackling more macro-level questions, such as algorithmic governance (e.g., Just & Latzer, 2017). Especially importantly, recent discussions of algorithmic bias and fairness have only barely been touched upon, and the same is true of general discussion about the things that may go wrong in society – or that already have – when decisions are delegated to algorithms. This is a limitation stemming from the choice of methods, cases, and data, and the matter has been discussed elsewhere in considerable depth (e.g., Eubanks, 2018).

While beyond my scope here, these issues are not entirely separate from the processes of classification and datafication discussed in this dissertation. How algorithms 'see' us affects how they classify us, and how they classify us may have very dramatic consequences. For example, if a predictive policing algorithm considers you a threat, you may face the consequence of the police paying a visit to your home. Similarly, it is entirely possible that an algorithm such as that described in Article II could, by flagging an aspiring local politician's social-media campaigning as containing hate speech, place that politician under the scrutiny of government officials. From a frame-analysis perspective, we could say that algorithms may be created such that they carry a way of interpreting some documented, or datafied, aspect of life such that individuals or organisations with power over us may frame their output in a consequential manner.

The consequentiality of classifications has long been a topic of study in social science (e.g., Bowker & Star, 2000), and the theme of how classifications can have a bearing on individuals' life was already present in Goffman's work. In the essay 'The Moral Career of the Mental Patient' (1959a), he describes the potential classification steps along one's journey of becoming a patient at a mental institution. Goffman aptly pointed out that far more individuals could have been labelled as mentally ill per the various norms in place in the 1950s than there were patients in mental institutions. Since not all people who could be regarded as mentally ill were institutionalised, some other processes had to lie behind becoming a patient at such a facility – namely, various ways in which

other individuals, certain organisations, or the subject him- or herself began to classify mental health. Questions that may seem to reside in the domain of macro-level studies do have their counterparts in the world of micro-level interactions that serve a role in upholding the macro-level structures (Blumer, 1986, pp. 6–7).

There is a clear limitation related to the samples in the studies: the data for all the articles were collected from Finland (with the research behind Article III possibly having some respondents located elsewhere). In the work for Article I and II, all interviewees were from the Finnish capital area, and the details of accounts for the final article were collected in the context of courses at the University of Helsinki. Likewise, the discussion-forum data in Article II are of Finnish origin, though one cannot say anything more specific about the discussants' location, and most of the data collected by means of the Internet form for Article III consist of Finnish-language material. While qualitative research does not presume to make generalisable statements in the sense that those working with statistical methods aim to do (e.g., Charmaz, 2006, p. 101), it must be acknowledged that the cultural and societal context of the data's collection has its consequences. For example, the phenomenon of account- and device-sharing differs between cultures, perhaps most strikingly so where information technology and opportunities to use it are scarcer than in the circumstances represented by Article III (e.g., Ahmed et al., 2017; Burrell, 2010; de Souza e Silva et al., 2011; Kuriyan & Kitner, 2009; Sambasivan et al., 2010, 2019). However, building on Becker's work (2014, p. 3), I do claim that the findings reported here offer some answers as to what is going on in various encounters with algorithmic systems, or about their role in the social world. In parallel with this, the concepts discussed here are ways of pursuing further answers and are applicable in other settings too.

6.3 OPPORTUNITIES FOR FUTURE RESEARCH

While I have demonstrated one way of using it, the game metaphor as a research tool could be developed further. I envision three areas of potential for deploying it in future studies of algorithmic systems.

One possible line of further study involves long-term focus on a single service, for examining its trajectory from development onward (which may encompass the decision to shut it down) through the relational game-metaphor perspective as proposed in this dissertation. What are the games the service goes through, and for whom or what are they played? Does the game get altered over multiple iterations of encounters or versions of the service? Are they played against adversarial organisations or with colleagues or financiers? What about the games humans play in relation to the service – or with each other with the aid of the service? Applying the game metaphor could prove fruitful in diagramming the history of a service as a history of interactions (see also Burgess & Baym, 2020).

The second avenue entails game-oriented operationalisation from a design perspective. Many algorithmic systems comprise elements that resemble some facets of games (Allen-Robertson, 2017), and services may outright use game-like elements to drive user engagement, a process called **gamification** (e.g., Hristova et al., 2020). For example, Chan (2019) has pointed out that ride-hailing service Uber's system for rating its drivers exhibits similarities to games. This approach could be followed further to delve into the design processes of games and other algorithmic systems. It could thus inform scholars' study of what similarities and differences exist, along with examination of whether algorithmic systems have been gradually growing more like games in their design.

An additional use of the metaphor might be found in asking participants themselves to describe their encounters with algorithmic systems through a game analogy, then elaborate these accounts into prototypes of actual games (with regard to using game design as a research tool, see Dumit, 2017). This method should help us to make tangible both the opportunities and the constraints that participants identify in their interactions with these systems (Dumit, 2017), and perhaps it could contribute to more understandable ways of describing the very real struggles that some individuals or groups may end up facing with algorithmic systems. Such endeavours should methodologically enrich the use of the metaphor further.

6.4 FINAL CONCLUSIONS AND CENTRAL CONTRIBUTIONS

With this dissertation I have demonstrated how the game metaphor in conjunction with frame analysis can function as a tool for the study of algorithmic systems. With Goffman's work as a theoretical foundation, I have drawn on several types of data to illustrate how the game metaphor facilitates approaching various types of encounters with algorithmic systems as processes wherein different actors – working together and against each other – construct the rules, frameworks, roles, etc. by which they play. The moves they make in relation to each other, in combination with the technologies present, adjust and sustain the frames that articulate what the game is about and the meanings of particular elements in the game.

Another key facet of the players and playing pieces is that the ways in which algorithms perceive the various moves may lead to serving entities or interests they were not initially intended to serve. Setbacks may arise if the context is not aligned with the functions of the system, and these need not be as benign as irrelevant music recommendations usually are. The findings on this front contribute to social scientific studies of algorithmic systems by offering insight as to how these systems may take on temporary, frame-specific meanings.

The findings I have discussed here show how algorithmic systems receive local meanings in specific interaction settings, or frames, and how the game

metaphor can aid in studying the processes wherein these meanings are obtained. From the human–computer interaction perspective, my work offers a reminder that the meanings assigned to information systems when they are brought into use by the wider population and as their use unfolds cannot be fully controlled or predicted. In use, they become parts of the social worlds of the people engaging with them and thus are made meaningful in their own local contexts of life within the weave of various interactions. My research also serves as a reminder that any service or technology is dependent on its users. This is all the more true with data-intensive services such as recommender systems, since these services' functioning relies fundamentally on data from users. That is why a relational perspective can be of assistance for understanding encounters with algorithmic systems *in situ*, as a complement to other methodologies for studying and developing information systems.

My research highlights how algorithmic systems, of many kinds, become defined and redefined constantly in interactions. It is my hope that this work offers new perspectives for scholarly enquiry and design but also through which all people can consider the role of technologies in their day-to-day life and that it can assist them to see how services that might seem the same may fulfil very different roles, dictated by factors such as one's situation in life. A technology that may function as a tool for play in some circumstances could be a cause of grief in others. Still, as part of the game, we are not powerless. However complex the games may be, we can reframe the role algorithmic systems play in the evolving situations that make up our lives.

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