Technology, Personal Information, and Identity

Abstract

Novel and emerging technologies can provide users with new kinds and unprecedented amounts of information about themselves, such as autobiographical information, neurodata, health information, or characteristics inferred from online behavior. Technology providing extensive personal information (PI technology) can impact who we take ourselves to be, how we constitute ourselves, and indeed who we are. This paper analyzes how the external, quantified perspective on us offered by PI technology affects identity based on a narrative identity theory. Disclosing the intimate relationship between PI technology and identity sheds light on a whole new range of ethical issues that have so far not received sufficient attention. Personal information provided by technology is not just information that *belongs to* individuals but that *changes* them.

Keywords: Personal Information, Identity, Narrative, Ethics of Technology

1. Introduction

Neuroimaging can tell you whether you are likely to be altruistic or extroverted (Nostro et al. 2018; Tusche et al. 2016) or that you will develop Alzheimer's disease (Ewers et al. 2011); health trackers can count your steps and measure your heart rate, sleep, mood, body fat, and many other parameters; the technologies to record, store, and retrieve autobiographical data digitally (through pictures, text messages, or location trackers) have become ubiquitous; and data mining companies can infer your preferences, political opinions, or even mental disorders from your online behavior (Loi 2019). Novel and emerging technologies have an enormous potential to provide users with information about themselves. The ethical debate so far has focused primarily on privacy infringement, manipulation, and potential abuse of personal information (Ienca, Haselager, and Emanuel 2018; Lanzing 2019; O'Hara, Tuffield, and Shadbolt 2008; Shoemaker 2010). The impact this information can have on ourselves, even if no other parties are involved, has not received sufficient attention (Postan 2020).

Having access to personal information about yourself can in itself benefit or harm you, it can impact your personality, and change your relationship with yourself and others. The extensive personal information made available through technology thus raises important conceptual and ethical questions regarding personal identity. In this paper, I aim to clarify how technology providing personal information to the users themselves (PI technology) affects their identity and address ethical concerns that arise. Disclosing the intimate relationship between PI technology and identity sheds light on a whole new range of ethical issues that have so far not received sufficient attention. Personal information provided by technology is not just information that *belongs to* individuals but that *changes* them.

The effect on identity is analyzed based on a narrative identity theory. The narrative self-constitution view is particularly well-suited to serve as a theoretical framework to assess the influence of PI technology on identity. Narrative identity theory claims that we constitute ourselves by integrating, relating, and connecting information about ourselves (this includes information about our autobiography, body, dispositions, beliefs, and emotions) to understand ourselves as a temporally extended, unified self. Personal information plays a particularly central role in narrative identity theory. This personal information is part of an interconnected network through which it becomes intelligible and meaningful. Moreover, narrative identity combines multiple dimensions of human identity that may be affected by PI technology. Besides furthering our conceptual and ethical understanding of how the self is constituted in a technologized society, this paper expands the theory of narrative identity to situate PI technology within that theory.

Emily Postan has argued that personal bioinformation (i.e., information about our bodies) can play significant interpretative and content-supplying roles in the construction of our self-narratives (Postan 2020, 2016, 2022). Particularly, bioinformation can contribute to the inhabitability, intelligibility, and coherence of the self-narrative. This paper constructively continues Postan's thought by exploring not only how this content can be integrated into the self-narrative, but how the framework and process of narrative self-constitution are affected by the availability of technologically sourced personal information. Furthermore, it expands on the kind of content that may be integrated into the self-narrative beyond bioinformation to include, among others, autobiographical information, traits, and preferences. In the literature on technology and identity, a range of other influences has been discussed, notably how our identity is changed by how we present ourselves online and how we interact with others through technology (Cocking 2008; Matthews 2008; Rodogno 2012; Turkle 1995). The question how our identity is shaped by the unprecedented amount and new kinds of personal information we may gather through technology requires more extensive analysis.

In the following, I analyze how identity is impacted by technologies that provide autobiographical information (text and call logs, pictures, or location trackers), neurodata (brain imaging or direct-to-consumer neurotechnology), health information (health and fitness trackers), and characteristics inferred from online behavior (data mining or recommendation systems). Admittedly, these technologies do not make for a very homogenous group. Nonetheless, it makes sense to discuss their influence on identity together. Besides offering a lot or new kinds of personal information, PI technology provides an external perspective that is quantified, measured, allegedly objective, and objectifying. This technological external perspective stands in tension with a first-personal, narrative self-understanding, as well as with relational external perspectives provided by other people we interact with.[i]

After a brief overview of those technologies (2) and an introduction to narrative identity (3), I consider how information provided by this technological external perspective is integrated into and shapes the first-personal perspective (4.1), how PI technology influences the interaction with relational external perspectives offered by others and imitates them (4.2), how the quantified, measured, and allegedly objective nature of the information constrains the first-personal self-understanding and relational negotiations (4.3), and why PI technology cannot be part of an extended self due to its objective, external perspective (4.4).

2. Personal Information Technology

Novel and emerging technologies can provide an unprecedented amount as well as new kinds of personal information. This section introduces important examples of PI technology which provides either qualitatively or quantitatively novel personal information. PI technology promises to deliver a lot of personal, sensitive, reliable, and relevant information about ourselves. However, many PI technologies end up falling short of their promises and cannot provide reliable and relevant personal information. In this paper, I discuss both, cases where I assume the provided information is reliable and where PI technology is untrustworthy.

An already very common and widespread kind of personal information provided by technology is autobiographical information. Various technologies allow users to record, store, and share autobiographical information. The digitalization of cameras and their integration into phones allows taking any number of pictures and videos of even the most mundane experiences. Text messages, call logs, and emails document a growing share of social interactions. Location trackers and browser histories record our physical and online presence. These technologies have become much more powerful and accessible (particularly in the global north) in the past decades. Even extreme versions of autobiographical information tracking are now feasible with moderate effort, as in "lifelogging", a practice in which a person, for instance, records every minute of her life with a wearable camera (Lupton 2016). In contrast to one's memory, this technological data does not decline over time, is not distorted by our individually biased perception, it can have nearly any degree of detail, comprehensiveness, and complexity, and it is easily and directly shareable with others.

Another rapidly growing field of PI technology are health or activity trackers. A health tracker can be a simple menstruation calendar or a complex device measuring heart rate, sleep cycles, temperature, and blood oxygen levels. They can be applications on phones and other devices (e.g., a step counter app, DrinkLess app to reduce alcohol consumption, MySugr to measure glucose levels for diabetics) or stand-alone wearables, such as the FitBit smartwatch, the Oura Ring, or smart clothing. Health tracking devices or applications are commonly used to improve health and fitness, for weight loss, to monitor medical conditions, or to generally get a better understanding of one's body. Most health trackers are designed to prompt or nudge the user towards more healthy behavior, for example by reminding them to exercise, setting fitness goals, or by giving personalized feedback (Lanzing 2019). Health tracking can be pursued privately for individual reasons, in a setting where data is shared with other people engaged in health tracking, it can be pushed onto people (e.g., by parents, insurance companies, or employers), it can be imposed (e.g., in a drug monitoring program), and it can be exploited by

various agents and agencies (e.g., governments, commercial companies, or research institutions) (Lupton 2017).

A further category of a comparatively novel kind of technological personal information is neuroinformation. Information about the brain stands out in comparison to other bioinformation because aspects deemed central for identity, such as personality, memory, and mental capacities depend on it. The most powerful method to gather neuroinformation is neuroimaging. The possible applications of neuroimaging advanced greatly in the past years thanks to machine learning and artificial intelligence. The methods for understanding the human mind through functional and structural brain imaging (e.g., MRI, fMRI, EEG, PET, CT, SPECT) have been applied to gain knowledge beyond the healthcare context about social attitudes, personality, impulse control, humor, lie detection, and memory suppression (Canli and Amin 2002; Farah and Wolpe 2004; Haynes 2006; Illes and Racine 2005; Absher and Cloutier 2016); it is used for diagnosis as well as for prediction of future conditions (Canli and Amin 2002); it finds commercial applications from neuromarketing to dating services (Farah 2011); and it can be assumed to become more widely applicable and available in the future. A number of direct-to-consumer neurotechnological devices and applications can already be purchased outside of clinical or research settings (Ienca, Haselager, and Emanuel 2018). They claim to deliver unique insights into body and mind, read emotional states, improve sleep, focus, cognitive and athletic performance, and more by using, for instance, wearable EEGs, galvanic skin responses, or non-invasive brain stimulation to record and modulate the brain.

Finally, it is possible to draw far-reaching inferences about an individual's characteristics based on online behavior. Spoken languages, age, political opinions, specific present and likely future preferences in food, clothes, or entertainment, and even whether one is likely to have insomnia or depression can be inferred from traces we leave online such as social media posts, Facebook likes, web search queries, location trackers, purchase records, playlists, or how we interact with a homepage (Loi 2019). Through artificial intelligence, the accuracy and scope of personal information inferred from a digital footprint can outperform human judgement. Studies have shown that personality judgements by computers through digital footprints are more accurate than close others and acquaintances (Youyou, Kosinski, and Stillwell 2015). Another example is a deep neural network that was better than humans at identifying sexual orientation based on facial images (81% accuracy for men and 74% for women) (Kosinski and Wang 2022). Especially large companies that can accumulate personal information across different platforms (e.g., Google through Google Maps, Google Search, Gmail, and other services), can generate detailed profiles of their customers. Algorithmic tracking may even be understood as a form of

extended mindreading (Peters 2022). This information can not only be used to target advertisements and voters, but it can potentially provide personal information to the customers themselves. Since being able to target specific groups is a very lucrative business, we can expect this categorization, characterization, and prediction of users to become more precise in the future.

3. Narrative Identity

According to narrative self-constitution views, you constitute yourself through an ongoing, internalized, and evolving narrative which recounts your life events from a personal perspective and reflects your characteristics, goals, and values (for an overview see Schechtman 2011). Narrative identity can also be understood as part of a pattern theory of the self (Gallagher 2013). In this view, the self is constituted by a cluster of dimensions of human beings (among others, narrative, experiential and affective dimensions, dispositions, character traits, social relations, cultural background, and embodiment). The self-narrative is one of those dimensions but it seems to play a central role as the organizing principle through which we engage in self-definition, integrate and connect the other dimensions of the self, make them intelligible, and ascribe personal meaning (*author reference*) (Dings and de Bruin 2022; Zawadzki and Adamczyk 2021).

The self-narrative is both explicit and implicit. We explicitly give an account of who we are or what we do to others and ourselves in terms of narratives. Through such accounts, we make sense of ourselves and our actions and communicate this to others. We summarize, abridge, highlight, find repeating patterns or combine a span of weeks or years into a distinctive period (Glover 1988). In making the self-narrative explicit, you reflect on and make decisions about who you take yourself to be and about your intentions and responsibilities. In this sense, explicit narrating is more than just voicing the implicit beliefs you hold about your life trajectory because it can shape and specify those views. At the same time, the self-narrative is implicit in the sense that your awareness of where you come from and expect to go to shapes the experience of the present moment, even if you are not explicitly or consciously considering the self-narrative. Parts you have made explicit before but are currently not consciously present as well as inchoate, vague notions of your life trajectory that have never been made explicit shape your experience implicitly. Thereby, the self-narrative provides a distinctive phenomenological perspective.

Through the phenomenological perspective of the self-narrative, the present moment is experienced in relation to the past and the anticipated future. You experience your life not as disjointed episodes but as part of the wider context of your life. Through this narrative context, single moments, actions, dispositions, etc. become intelligible and meaningful (MacIntyre 1984;

Bruner 1990). The diachronic unity created by the self-narrative allows for a distinct kind of self-understanding and engagement with the world. Only if you think of yourself as a diachronic entity, does it make sense to actively plan and lead your life, to take responsibility for past actions, or to hold special concern for your own future (Schechtman 1996). The perception of oneself as an agent shapes the self as a subject (Schechtman 2011). Moreover, by projecting ourselves in the future through a narrative, the self-narrative is action-guiding. We try to enact the imagined futures suggested by the self-narrative (Velleman 2006; McConnell 2016a). Taking this integrative, diachronic, and meaning-ascribing narrative perspective generates a qualitatively different experience that allows us to understand ourselves as ongoing agents engaged in meaningful activities.

To be able to engage in social, forensic practices concerned with responsibility and accountability, the self-narrative must be intelligible in the folk psychological terms we use to explain ourselves to one another (Schechtman 2012), and one needs to be able to articulate it at least partially. Others will only hold someone accountable, enter a binding commitment or contract, or praise and blame them if they can give an account of themselves (articulation constraint) and share some common ground of how the world works (reality constraint) (Schechtman 1996). One would usually not sign a binding contract with someone who beliefs he is Napoleon. Thus, the self-narrative should not include gross factual errors with respect to a shared understanding of the world. However, based on the brute facts of a person's life it is possible to create different self-narratives by highlighting or neglecting different aspects and interpreting actions and life-events differently. Self-narratives leave room for creative self-definition within the constraints of articulation, intelligibility, and gross factual accuracy.

4. How Personal Information Technology Impacts Narrative Identity

The quantified and seemingly objective external perspective on us through PI technology affects narrative identity on the level of the content of the self-narrative as well as the process and frameworks of narrative self-constitution. In this section, I aim to clarify the implications of PI technology for narrative identity by considering (4.1) that PI technology provides content for the self-narrative and changes what we deem significant about individuals, (4.2) it impacts the dynamics of relational self-constitution, (4.3) it imposes extra checks on the self-narrative and leads to a different kind of negotiating disagreements and (4.4) I argue that despite its far-reaching influence on narrative identity, PI technology is not part of an extended narrative self. In each case, I discuss the influence of PI technology on identity and highlight ethical issues that arise.

4.1 Content and Significance

The broad range of personal information made available by technology can supply content for our self-narratives. Thereby, the external, technological perspective is integrated into the first-personal, narrative self-understanding. PI technology can provide three forms of content: data, patterns, and narrative templates and pieces.[ii] 1) Data: PI technology can provide single data points that are not interpreted and processed to connect them to an individual's overall characteristics or life trajectory, for example, body temperature, location tracking, a daily step count, or a certain neuronal state. Of course, this data does not come without a framework of interpretation and meaning (Gitelman and Jackson 2013). Devices and applications already suggest a meaning and interpretation of their data. But it lacks *personal* significance and meaning. The data is comparatively uninterpreted and uncontextualized with respect to one's narrative identity. To provide *self*-knowledge, it needs to be integrated into the self-narrative and interpreted in light of one's goals, intentions, actions, and other features of the self (which can mean to adopt or reject the interpretation and meaning offered by the PI technology itself) (Schechtman 2012). A 39°C body temperature measurement of a health tracking device might be displayed in red, thereby offering an interpretation of a warning. But to understand what this data means for the individual, we must know whether this is a toothing toddler, an adult who was meaning to attend his friend's wedding, or a minimum wage worker who cannot afford to stay at home. The data on its own does not suggest what it means for the individual, what its position in the self-narrative is, and to what degree it matters for one's identity. This data can be made *personally* meaningful and intelligible and shape the first-personal perspective by integrating it into the self-narrative.

2) Patterns: Beyond measuring data points, PI technology can find and define patterns within this data, such as digital profiling to identify preferences, dispositions, and interests, behavioral patterns and traits derived from neuroinformation, or sleep patterns determined by a health tracker. Thereby, it offers categories and labels that may account for elements of the self-narrative that go beyond the measured content and beyond the present state. Patterns identified by PI technology can serve as an interpretative tool to reevaluate past and present elements of the narrative, as well as future projections. Patterns and categories relevant for the self-narrative can be both discovered and defined by PI technology.

3) Narrative pieces and templates: The third kind of PI technology content is a narrative template or a piece of a self-narrative. Both provide diachronic information. With pieces of a self-narrative, I mean personally individual fragments of a self-narrative. Autobiographical

information, such as a text message or a picture, can have a narrative structure and provide a piece of an overall self-narrative that is specific to the individual user. For example, a text message stating "I am breaking up with you" is not just a data point but carries temporality that points towards the past and the future. By providing data with a narrative structure PI technology can offer even more direct input into the self-narrative.

A slogan of the Quantified Self movement "What gets measured gets managed" illustrates a further diachronic aspect of PI technologies that can provide and support narrative pieces. PI technologies are often used to support users to achieve certain goals and to track their path towards those goals. Knowing your present state against the backdrop of a medical or social norm or others' metrics can provide a goal and often also a way to reach it. This is common in health-tracking, but we can also imagine a scenario where a PI technology claims that someone is egoistic (e.g., through data mining or neuroimaging) which incites the individual to work on this aspect of their character because of existing social norms discouraging egoism. Technology can set you on a path by showing you where you are and where you could be.

Moreover, being set on that path changes how you perceive the present (Jones 2008). When your fitness tracker shows you that you set a new personal time record for running 5 miles, the phenomenological experience and meaning of this moment differ from the case where you just run without a set goal. You experience this moment as the end of a journey you have been on for the past months. Of course, someone could just set the same goal without a health tracker and time herself with a stopwatch. But PI technology can facilitate this process. It can lower the threshold to pursue a goal by suggesting a narrative structure that makes the pursuit of the goal intelligible, provides a projection into the future, tracks and presents one's previous development, and that can be readily integrated into the self-narrative.

Narrative templates are generic narrative structures that can be adopted or emulated by the individual, like culturally shared master narratives and canonical life scripts (Fivush et al. 2011). The redemption narrative of overcoming and learning from negative life events and achieving a more positive self-narrative is a common master narrative (McAdams et al. 2001). Some health-related PI technologies encourage the user to understand themselves as within a redemption narrative. The "Smoke Free" mobile app, for instance, not only helps you to track every cigarette you smoke (or do not smoke) and how much money you save by quitting but encourages the user to imagine their positive future as a non-smoker, to adopt the identity of a non-smoker, and it promises an increased belief in your inner strength (Crane et al. 2018). Users are encouraged to construct a projected future narrative as a redemption narrative by seeing their

future self as someone who overcame the addiction and who is happier, healthier, and has more inner strength.

By providing content PI technology can make our self-narratives richer, more detailed, and it may reveal self-delusions.[iii] A person may have a clearer picture of her health and where her physical limits are thanks to a health tracker. Someone may be able to better understand why a relationship ended by reading past text messages and thereby learn how this may be avoided in the future. PI technology provides data, patterns, and narrative pieces and templates you can integrate into the self-narrative. If this content is largely in agreement with your self-narrative this should be unproblematic. In case it is in tension with your self-narrative, you have two options to uphold the coherence and intelligibility of the self-narrative. Either you reject the personal information provided by the technology by claiming that it is unreliable (in general or in this specific case) or you adjust your self-image to accommodate the new information. The former is an easily available option for technologies like data mining or some forms neuroimaging that (currently) have fairly large margins of error, but it is much harder for personal information in the form of text messages, videos, or some standard forms of health tracking (e.g., a weight tracker). A self-constituting narrative must be intelligible in terms we use to explain ourselves to one another (Schechtman 2012). This includes facts and folk psychological interpretations concerning yourself (where you were born, why you study philosophy) as well as the world in general (do text messages just change over time, should one trust neuroimaging to detect a stroke). A self-narrative of a person who always beliefs that text messages show interactions as they occurred except in the one case where they reveal that he is not as helpful as he thinks would lack coherence and if he started to distrust all text messages (without further strong evidence) he would likely violate the reality constraint.[iv]

In cases where PI technology can help us to understand ourselves better, it renders our narrative perspective more suitable to navigate the world (Postan 2022). This potential of personal information for impacting how well we navigate the world shows how important it is that the information provided by technology is accurate and reliable and conveyed in a manner that does not invite unfounded expectations about the meaning and accuracy of the revealed information (Postan 2022). Unreliable information could lead a person to adopt a distorted, less intelligible, self-deluded, and unhelpful self-narrative.

Some of the content provided by PI technology, particularly neuroinformation, suggests a reductive view on ourselves. As I have argued elsewhere (*author reference*), accounting for our behavior, emotions, or characteristics in reductive, biochemical terms (in terms of neurons firing and muscles contracting) can deprive them of meaning. Self-narratives ascribe meaning to events

by connecting them to a context of intentions, beliefs, personal history, values, and institutional settings, i.e., of intentionality. Describing features of oneself in reductionist terms can disconnect them from their meaning-generating context. PI technology, particularly technology providing bioinformation, can favor the reductive, biochemical perspective on ourselves. In some cases, it can be liberating to view aspects of oneself as meaningless. Understanding that I am just angry because I am hungry can save me from trying to understand my angry behavior in other ways. Sometimes, however, it can be problematic to deprive events or features of oneself of meaning, particularly if the individual is not sufficiently prepared or in control of which perspective she wants to take on herself and if events and features are affected, she was not willing to have stripped of meaning.

Another potentially far-reaching impact of PI technology on identity is its ability to shape what we deem as important information about an individual. A few decades ago, hardly anyone used to know their daily step count. Now, for many people, it is at least temporarily an important project to achieve a certain number of steps a day. Similarly, the availability of genetic heritage testing turned genetic heritage into an important aspect of many people's identity. Neurotechnology could provide new diagnostic categories and Spotify informs you, for instance, that you were in the top 2% of Childish Gambino listeners. PI technology shapes what we deem meaningful about ourselves by offering new information we can attribute meaning to as well as by connecting data points, labels, and categories with other meaningful categories, such as 10,000 steps with health and fitness. Companies are already exploiting such identity effects to bind users to their products (e.g., Spotify binding customers by making them feel special about their unique music taste which they can listen to on their platform).

Of course, not just any category or datapoint PI technology provides can be considered personally significant. Charles Taylor argues that we cannot individually decide what meaningful, self-defining characteristics are (Taylor 2003). A person cannot decide that the number of hairs on his head is meaningfully self-defining. What is meaningful is constituted by shared *horizons of meaning*. It cannot be an individual choice because otherwise, anything could be deemed significant which would ultimately leave us with universal insignificance and triviality. Besides providing personal information that can be considered personally significant in the face of current, culturally shared horizons of meaning, PI technology can gradually alter and shape those horizons. Advanced brain scans or data mining could, for instance, uncover and define new characteristics (e.g., personality traits) that are gradually considered significant features of individuals or PI technology can suggest new life projects that are seen as self-defining.

Given the potential of PI technology to shape what we deem significant about an individual, we should carefully consider whether specific technologies influence our horizons of meaning in a harmful or beneficial way. PI technology could, for instance, push us to consider personal features as significant and self-defining which promote bigotry and division, or which are ultimately degrading. Moreover, the impact of PI technology on meaningful self-definition raises justice concerns due to the unequal accessibility of PI technology. Only individuals with access to the technology get to define themselves in relation to the personal information it provides. Potentially fulfilling dimensions of meaning and significance can only become part of the self-narratives of users of PI technology. Additionally, people who come to see labels, categories, and other characteristics identified by PI technology as meaningfully self-defining could become disconnected from others who do not have access to technology that allows them to define themselves along the same lines. The former may consider the latter as insufficiently well-defined in significant ways.

4.2 Relations

PI technology changes the dynamics of relational narrative self-constitution. Narrative self-constitution is deeply embedded in a social and cultural context. It requires language which depends upon a social context, children are being taught how and encouraged to narrate their lives (Fivush et al. 2011), we learn to know ourselves through interacting with and comparing ourselves to others, we have to give an account of ourselves to others in narrative terms (Butler 2001), others constrain what kinds of narratives we can adopt to navigate life successfully or without experiencing resistance (Lindemann 2001), we define ourselves through our relations to others, and others define labels and narrative threads and templates and suggest which ones are appropriate both on an individual and group level.

The nature of the relational aspect of narrative self-constitution is a controversial issue. Hilde Lindemann Nelson and Françoise Baylis (Baylis 2012; Lindemann 2001), for example, suggest a very strong relational component. Baylis argues that narrative identity is at the equilibrium between the narrative others construct about you and your own. Who you are is not just defined by your own self-narrative but also by how others see you. Similarly, according to Lindemann Nelson personal identity requires social recognition: "Your identity as a white person hinges on the acknowledgement of others that you are white." (Lindemann 2001, 81-82). Schechtman, among others, describes a more indirect role of others in *The Constitution of Selves* (1996). To constitute yourself as a person you must have a particular kind of subjectivity (the first-personal perspective shaped by the self-narrative) and meet the reality constraint which depends

on a shared sense of reality. Others provide the framework conditions and side constraints within which individuals can constitute themselves. The development of narrative capacities depends on others and those capacities are necessary for us to meet the intrinsically social concept of personhood. Nonetheless, the self remains a first-personal perspective.[v]

In line with the account of narrative identity introduced above, I analyze the influence of technology with reference to the relational dimension of narrative self-constitution with reference to an indirect role of others.[vi] If the self is constituted by the phenomenological, first-personal narrative perspective characteristics or traits continue to be part of this perspective even if they are not recognized by others. Others can stop you from acting in accordance with how you define yourself, but they cannot stop those labels from shaping your perspective. What ultimately matters for selfhood is this first-personal view. Others can however strongly influence, and to some degree co-narrate the self-narrative (in the sense that one may adopt and integrate their accounts of oneself into the self-narrative) and the first-personal view it constitutes.

A reason why PI technology can influence narrative self-constitution on the relational level is that technologically conveyed personal information is easily shareable. There is no privileged first-personal access to the technological external perspective on ourselves, in contrast to introspectively gained information. Some technologies encourage their users to share personal information and try to make it as easy as possible. Moreover, the structure and presentation of technological personal information make it comparatively easy to explicitly narrate. PI technology already provides specific categories, labels, and data points to refer to in dialogue with others. The individual does not need to put potentially messy, inchoate, and complex thoughts, feelings, and experiences into words or images themselves. Furthermore, some experiences are particularly hard to account for in narrative terms. A person experiencing a panic attack may find it easier to give an account of the event if she can explicate her experience through an increased heart rate or neurological changes. Some experiences that may be hard to grasp or just overwhelming can be more manageable through information provided by technology.

Information provided by technology is often seen as relatively objective and reliable as it is generally gathered through a standardized method for all users. In contrast, the information generated through introspection and the testimony of others is more susceptible to personal biases and delusions. Of course, PI technology is often unreliable and not bias-free, but it is usually free of highly idiosyncratic biases. In relational dialogues about an individual's identity, some PI technology can be brought in to provide evidence as a trusted and authoritative source of information, often even more so than first-personal information. A powerful example of this is the central park birdwatching incident, in which a white woman called the police on a black

man, accusing him of threatening her (Nir 2020). His video recording of the incident clearly shows that this is not true. In the relational dialogue of what kind of person he is and what he did, technology has provided information that dismissed her account and supported his view on the experience as an unfounded racist accusation. Through PI technology, others were able to confirm his self-narrative and support him in agreeing with his account. The video provided an opportunity to share his experience in such a way that it can hardly be challenged. PI technology can lend support or undermine positions in the dialogue of narrative self-constitution, and it can sometimes do so with great authoritative force.[vii]

Furthermore, PI technology can take the role of the other in the dialogue of narrative self-constitution. Similar to how we interact with other people's external perspectives on us, we can relate and react to the external perspective on ourselves provided by PI technology. Others indirectly shape our self-narrative by showing us through their reactions who we are, by explicitly describing us, or by reminding us of our past. PI technology can also take up this role and reflect your image just as others do (Prey 2018). It can reveal who you are by "reacting" to your online behavior by showing you relevant ads. It can explicitly describe you by suggesting labels, patterns, and narrative templates and pieces and deny others. Examples are the musical taste identified by Spotify, a personality trait or diagnostic category conveyed through neuroinformation, or the categories that are created for targeted advertisement. Moreover, like an old friend reminiscing about the shared past, PI technology can remind you of or vivify episodes of your autobiography through pictures, videos, texts, and other autobiographical data. In contrast to human co-narrators, technology is free of relational baggage (e.g., there is no need to feel guilty in rejecting personal information provided by technology). This could facilitate a more independent assessment and decision to embrace or reject the provided information.

By entering into this self-constitutive relation, PI technology should follow the ethical norms that also apply to us in co-authoring narrative identities. Notably, we should ensure that the labels and categories created by this technology are not damaging or oppressive (or cementing already prevalent damaging and oppressive characterizations) and that the user is supported in assessing the accuracy and correct interpretation of the provided information (Cheney-Lippold 2017; Postan 2022; Lindemann 2001). Damaging co-narration through PI technology could leave the individual insecure in her authorial skills (e.g., this brain scan reveals that I am introverted, even though I considered myself as outgoing – I must have a flawed self-perception). It can alienate someone from his values (e.g., Google categorized me as female because I like crocheting, even though I identify as male – maybe I should find a different hobby). And it can encourage a person to pursue self-defeating values and self-narratives (e.g., if this neurodata shows

that my addiction is ingrained in my brain, I must be a helpless addict) (McConnell 2016b). For sensitive and intimate information, such as an AI that identifies someone's sexual orientation, the potential for harmfully influencing an individual's self-narrative (let alone other, non-identity-related harms such as government prosecution) is particularly worrying. A lot of personal information by PI technology is provided for commercial interests and not with the individual's best interests in mind. Therefore, external regulation may be warranted.

In the best case, PI technology can have positive effects on narrative self-constitution, by supporting authorial skills through fostering trust in one's self-assessment, or by promoting healthy and authentic values. For instance, PI technology could confirm experiences the information subjects themselves are insecure about or commonly challenged. One member of the Quantified Self community measured the physical effects of racial micro-aggressions through health-trackers (e.g., an increase in heart rate) (Clark 2018). To him, this technology confirmed that the racial micro-aggressions are real in the sense that they have a measurable impact on his health. It provided him with data to support his view, not only in the dialogue with others denying the reality or impact of micro-aggressions, but to settle his own insecurities.

You may reject the picture some technologies paint of you, just as you may reject the narratives other people make about yourself. This rejection of technological characterization can occur on various grounds: by denying that it is based on the relevant data, that the data has been interpreted correctly, or that it has correctly defined relevant general categories. Even if we reject a certain characterization, it can still prompt us to think about ourselves in these terms or to wonder whether we fit in a category. Depending on the technology, rejecting a characterization can prove difficult. It can be hard to reject a technologically generated self-description if it is generally accepted as accurate. Additionally, it is often difficult to find out and understand how technologies generate characterizations. If a friend tells me that he thinks I am introverted, I can ask him why or reflect on whether I acted introverted toward him. But if I am labeled as introverted by a tech company like Google or a brain scanner, I may not understand which data was used in the process, I likely do not have access to the algorithms that generated this label, or I may lack the expertise to understand the process. Knowing the process of how information has been generated can help to judge its accuracy, and in this context to assess whether to reject or embrace it. Thus, based on identity concerns, we have an interest to make these processes as transparent and accessible as possible.

4.3 Checks and Negotiations

A further way in which PI technology can impact narrative self-constitution is by imposing more checks on the self-narrative and shaping how we negotiate disagreements. As argued in section 3, to engage in social practices concerned with moral agency, the self-narrative has to meet a reality constraint, meaning that it fundamentally coheres with a shared reality and is kept in check by it (Schechtman 1996). With individuals who assumingly do not have a solid grasp of reality, we do not sign a contract, hold them accountable, or see them as deserving blame or praise for their actions (or at least not in the same sense). A highly delusional self-narrative prevents the individual from engaging in certain social practices.

The reality constraint pertains to facts about the physical world, for instance, can humans fly, does turning on the light cool down a room, who said or did what in a given moment. Other aspects of our identity are less directly connected to the physical world and are more open for interpretation and disagreement, for example, whether a person is popular, considerate, or a Beatles fan. Disagreement on these matters does not just arise from differences in how the descriptive concepts should be defined or views on facts about the physical world but from disagreeing perspectives on what certain actions mean or how they were motivated. If an individual's views on these interpretive aspects deviate strongly from their peers and he is not responsive to arguments, the reality constraint is also violated (Schechtman 1996, 125-130).

PI technology can broaden the application of the reality constraint and in that sense impose additional checks on the self-narrative. Aspects about myself I may not have been aware of can be brought to my attention through PI technology. To follow the reality constraint entails recognizing reasonable evidence about who one is. If the personal information made available by technology is of explicatory value for features of an individual's identity, he faces a burden to acknowledge it in his self-narrative. A person may not have been aware that her recent gambling addiction is caused by a brain tumor, but once this is confirmed through neuroimaging, she would violate the reality constraint by ignoring this information. In case the external perspective of PI technology clashes with your self-narrative, you need intelligible and coherent reasons to reject the external viewpoint in order to adhere to the reality constraint. Many technologies that provide personal information available today leave ample room for doubt (e.g., the categorization by Google) but others are generally understood as reliable sources of information. If a person thinks he made a witty remark at a social gathering, but a video of the evening proves that someone else made the witty comment, he would have to adjust his self-narrative or he would violate the reality constraint (Schechtman 1996). The spread of PI technology, especially technology that can record autobiographical information, leaves us more prone to being corrected.[viii]

More checks on the self-narrative can render it more accurate with respect to the kind of facts covered by the reality constraint and prevent self-delusion. You may find ways to stick to your self-narrative even if all evidence points against it. But eventually, the self-narrative becomes unsustainable once it gets too incoherent, implausible, and convoluted (see above example of person who does not believe in evidence of text messages whenever they contradict his self-narrative). Personal information provided by technology can increase the pressure for revision. Thereby, they can make it easier to understand oneself and navigate the world. However, it can also limit options for creative self-definition (Floridi 2011). Within the boundaries of the reality constraint, it is possible to construe different narratives about a person. Narrowing those boundaries by rendering more episodes of one's life or personal characteristics into measured facts can limit the options of who you can take yourself to be. Thereby, you have less control over who you are. In some cases, this can be unproblematic or even good for the individual (e.g., a person who is very unsure or unstable in who she is). But it can also stifle creativity and lead to a feeling of being locked in a certain kind of personality. Moreover, some aspects of one's identity may be hard to understand and accept. Someone may require some time to come to terms with a feature of their identity (for instance, one's sexual orientation). Being exposed to quantified and measured information about such a personal feature differs from a gradual, slower process of personal insight and realization. A more sudden exposure through PI technology can, in some cases, be stressful, troubling, or even traumatic.

The increased availability of quantified and measured personal information through PI technology can furthermore lead to a different way of defining oneself and negotiating one's identity with others. Many features of an individual's identity are a question of interpretation. For instance, to find out whether someone is stressed out by his job we tend to interpret emotional reactions (in the first-personal case), actions, or facial expressions. Was his outburst a sign of overworking or a just reaction to a frustrating situation? If he uses a wearable EEG device that can reliably detect heightened stress levels at his workplace, this question could turn from a question of interpretation to one about facts. Instead of wondering whether an outburst, a nervous tic, or a disinterest in his hobby are signs of stress, he and others with whom he is engaged in relational narrative self-definition may wonder how reliable the wearable is, what it measures, and how the measurement relates to workplace stress. In this scenario, he is wondering and negotiating with others about facts regarding technology, physics, and brains and not interpretations of actions and emotions. PI technology cannot only make quantified personal information more accessible and widespread, but it may enable the measurement of personal characteristics which have not been objectively and reliably measurable so far.

4.4 Extended Self

For many, particularly people in the global north, technology has become a central part of their lives. They use technology to interact with each other, work, play, store memories, gather information about themselves and the world, and many other activities. The omnipresence and sometimes high dependence on technology raises the question whether technology is part of the self. In light of a narrative self theory, we may wonder whether PI technology, particularly PI technology concerned with autobiographical information which is at the core of the self-narrative, constitutes the narrative self as part of an extended self.[ix]

Based on an extended cognition theory, Richard Heersmink argues that external information can constitute memory (Heersmink 2018, 2017, 2020). Because this extended autobiographical memory is constitutive of the self, according to narrative identity theory, the narrative self is also extended. Thus, according to Heersmink, technologies such as lifelogs can be part of the self and should receive special protection from interference in such cases. However, if we look in more detail at the narrative self-constitution view, we see that autobiographical memories only contribute indirectly to self-constitution. The narrative self is constituted by the phenomenological perspective which allows us to see ourselves as diachronically extended agents, living a personally meaningful life. This self-constituting perspective, due to its nature of being a perspective, is situated in the individual and cannot be extended. According to this view, the self is not an object that can have more or less extension, but a perspective that enables a specific self-understanding, agency, and engagement with the world. As Thomas Nagel argues, the subjective point of view of the self cannot be accounted for in objective terms. "Any attempt to conceive persons completely as a kind of thing in the world persisting through time will come up against this obstacle. The self that appears to the subject seems to disappear under external analysis." (Nagel 2012, 201) By treating the self as an object, its subjective nature is lost. In the narrative account, which is fundamentally subjective, the partially objective nature of the self is preserved insofar as the objective perspective on ourselves features in the self-narrative and shapes the subjective point of view. The self-narrative, in which autobiographical memories are connected, contextualized, and linked to a projection into the future constitutes the narrative perspective. This means that memories do play a central role for the narrative self, but they do not directly constitute the self. The phenomenological experience of the individual cannot be instantiated by technology.

Nonetheless, PI technology can shape, stabilize, or evoke this narrative perspective. It shapes narrative identity by reminding us of certain moments or characteristics which can give

them more weight in our self-narrative. If you had to watch a video compilation of your most clumsy moments every day you would probably consider yourself clumsier and it would feature more prominently in your self-narrative than before. We can incorporate the external perspective on ourselves offered by memory storing technology into the first-personal viewpoint. PI technology, particularly technology recording and storing autobiographical information, can stabilize the self-narrative by providing autobiographical memories which do not change or fade. And it can evoke particular narrative threads and let you experience the present in their light as well as shape your more general ideas about who you are. Specific narrative threads and themes can be more or less present in a given moment and shape the present experience accordingly. Even if you watch the clumsy video compilation just once, you may temporarily experience yourself as particularly awkward or uncoordinated, until the video is forgotten again. At the same time, the broad, general gist of the self-narrative generates an almost permanent background to our experience. It provides an inchoate sense of being on a personal trajectory through life, of being a diachronic entity, as well as a general idea of how you came to be where you are now, where you will be in the near future, and what kind of person you are. It generates, for example, a basic sense of self-worth or financial security (Schechtman 1996). PI technology may even evoke this broad gist of the self-narrative. It can, for example, allow a person with severe dementia to at least temporarily understand herself as on her personal, temporarily extended trajectory through life and to ascribe meaning to the present situation in light of the bigger unity of her life.

For some individuals, PI technology plays a critical role in shaping and upholding the narrative self. For instance, lifelogging has been used in the healthcare context to help patients with memory disorders improve autobiographical memory (Berry et al. 2007; Piasek, Irving, and Smeaton 2016). Thus, even if the narrative self is not extended, PI technology that greatly supports narrative self-constitution warrants special protection from interference. The narrative self-constitution view provides further reasons, beyond regular property laws, that lifelogs, photo albums, or diaries that enable people to uphold a self-constituting narrative perspective should not be destroyed, withheld, or substantially altered without informed consent.

5. Conclusion

Technology that provides us with personal information affects narrative identity in multifaceted ways. With further development and increasing accessibility of PI technology, identity influences can be expected to become ever more relevant in the future. PI technology offers a quantified and allegedly objective external perspective on ourselves that stands in tension with the first-

personal narrative self-understanding and relational external perspectives other people take on ourselves. It provides different forms of content for the self-narrative which may enrich it, it can deprive meaning of events and features of the self, and change what is considered significant information about an individual. PI technology influences the dynamics of relational self-constitution by making parts of the self-narrative more easily narratable, by supporting or undermining positions in dialogues on identity narratives, and by taking the role of a co-narrator. It imposes additional checks on the self-narrative and makes personal information quantifiable and measurable which alters options to negotiate disagreements. Finally, even though PI technology is not part of the narrative self, it can shape, stabilize, and evoke the narrative perspective.

The extensive impact PI technology can have on narrative identity raises a range of ethical concerns. Personal information provided by technology can be unreliable, damaging, oppressive, intransparent, limit creative self-definition, it could prompt us to adopt a bigoted view of what is significantly self-defining about a person, and the intimate relationship between PI technology and identity means that distributive justice issues can harm identity interests. However, PI technology can also support narrative self-constitution by enriching self-narratives, making them less prone to error and self-delusion, facilitating explicit self-narration, supporting individuals' accounts of who they are for themselves and towards others, and helping people uphold a narrative perspective. Our identity interests are ethically relevant and should be considered and protected (Postan 2022).

The broad areas of influence of PI technology on identity discussed in this paper and the ethical concerns that arise from them can serve as a conceptual framework to address the influence of specific technologies and technological applications in detail. Moreover, it raises further research questions, such as whether we have a right to know certain kinds of information about ourselves gathered by technology and tech companies or a right not to know them and be protected from disclosure as well as what ethical reasons exist for knowing oneself through technology.

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Endnotes

[i] I would like to thank the reviewer for helping me to clarify this point.

[ii] The distinction in data, patterns, and narrative templates and pieces does not apply to PI technology exclusively. Non-technologically gathered or stored personal information can also come in these forms.

[iii] I would like to thank the reviewer for helping me to clarify this point.

[iv] For more on self-delusion and errors in narrative self-constitution see Schechtman (1996, 2012).

[v] I cannot argue for this in detail at this point, but in my view, giving up the idea of a self-narrative as a first-personal point of view comes at great costs. Through the first-personal self-narrative we construe a self that is the basis for understanding ourselves as diachronically extended agents, through which we make ourselves intelligible to ourselves and others, that is action-guiding, and through which we perceive and interact with the world. By locating the self in-between the first- and the third-personal, the self no longer fulfills those functions. Moreover, it cannot do justice to the asymmetry in how others and the individual itself contribute to self-constitution.

[vi] The following discussion can however be adapted to other narrative identity theories, such as ones that have a stronger relational component.

[vii] Although, it should be mentioned that even in the face of very clear evidence people can come up with different interpretations. Moreover, even correct data can paint a wrong picture by omitting relevant facts.

[viii] However, novel technologies can change what is deemed a reliable source of information. A current example are Deepfakes, videos or other digital media where the likeness of one person is convincingly replaced with another, that challenge the reliability of video recordings.

[ix] Another question would be whether the embodied self can be extended according to this narrative account, for example in cases where prosthetics are considered a part of the body. Narrative identity theory does not exclude that other dimensions of human beings, such as the embodied self, can be extended.