Digital Practices Tracing: Studying Consumer Lurking in Digital Environments

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The aim of this article is to introduce a methodological framework for the systematic capture and analysis of consumer lurking practices in digital environments.

Despite the prevalence of lurking practices in digital environments, it is an understudied topic in marketing and consumer research due to methodological constraints. To remedy this, we introduce *Digital Practices Tracing* (DPT), a novel methodological framework that integrates digital methods and post-phenomenological inquiry. Specifically, the proposed methodology enables the capture of lurking practices as they occur naturally by using tracking devices and uncovering underlying motivations via follow-up interviews. The contribution of the article is threefold. First, it provides a very detailed research protocol (articulated in six sequential steps) to implement the DPT framework. Second, by illustrating the value of this methodology with a pilot study on lurking practices, it puts forth an ad hoc taxonomy of digital lurking practices (*See*, *Search*, and *Save*) as they occur in real time in their natural environments - making them *de facto* visible. Third, it demonstrates how the DPT framework can be applied to the study of a wide range of consumer digital practices that go beyond lurking.

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Introduction

To begin with, we define digital practices as online actions through which people inhabit and make sense of digital environments (Fernández-Ardèvol et al., 2019) and construct new social realities in everyday interactions (Madianou & Miller, 2013). Digital practices carried out by consumers include interconnected series of actions such as searching, browsing, posting, saving content on a wishlist, tracking price fluctuations, and reading recommendations and reviews. Such practices can be aligned to consumers' decision-making journeys (Ashman et al. 2015) but can also encompass more diffuse forms of online flânerie, such as scrolling through social media posts and other web content for their aesthetic value (see Denegri-Knott & Molesworth 2011; Denegri-Knott et al., 2022) or for stimulanting consumer desire (Belk et al., 2020; Kozinets et al., 2018). Digital practices also include social interactions which support socialisation into brand-oriented practices as reported by Schau et al. (2009), but also everyday practices like home decorating and meal preparation. Therefore, studying digital practices means understanding how people *live in* digital media, rather than how they live *with the* digital media (Deuze et al., 2012); in fact research on digital practices focuses more on what people *do* with digital devices, rather than their perception and/or opinions about them (Madianou, 2014). These *doings* (Schatzki et al. 2001) tend to leave behind a 'digital trace' which captures interactions between a digital medium and a given user activity (e.g. the log of an ecommerce transaction) (Venturini et al., 2018: 4200). For this reason, social researchers using computational techniques have been able to explore a wide range of digital practices, spanning from patterns of smartphone use (Stier et al., 2020), browsing habits (Hosseinmardia et al. 2021), and styles of navigation within websites (Aipperspach et al., 2006), to manipulation of digital infrastructures (see for example those studies showing how users hijack Twitter hashtags for visibility purposes; Jain et al., 2015), or use them to create different kinds of social formations, like crowds, communities, or publics (Caliandro, 2018).

In marketing and consumer research, there are two kinds of digital practices that are of particular interest, and can be distinguished by the degree of public visibility of consumer actions: *posting* and *lurking*. Posting is generally understood as visible contributions to public or semi-public spaces (Crawford, 2011). Lurking, on the other hand, does not generate publicly visible digital traces, since it is described as visiting an online community without posting any messages (Ridings et al., 2006; Schlosser, 2005; Sun et al., 2014) or visibly interacting (Gerson et al., 2017; Trifiro & Gerson, 2019; Verduyn et al., 2017). Thus, lurking as a form of participation is frequently conceptualised as content consumption (Antin & Cheshire, 2010; Kushner, 2016; Soroka & Rafaeli, 2006). However, recent research indicates that besides content consumption such as reading posts or viewing videos, which Crawford (2011) describes as 'listening', lurking includes other non-content-generating actions that reflect an individual's interests and preferences (Gong Wei et al., 2015; Leban et al., 2020), such as searching or creating wishlists. Lurking can therefore be understood as not only listening but also acting in a hidden way. As Kushner (2016, n.pag.) remarks, "lurking is the remainder of human activity that fails to conform to the logics that drive the Web 2.0" and therefore persists regardless of platform incentives for active participation. Like Crawford (2011), Kusher (2016) emphasises that studying lurking is as important as studying public participation, which has been given disproportionately greater attention in the previous consumer and marketing research (Audy Martínek, 2021).

Importantly, lurking is a commonly occurring digital practice, representing the vast majority of all user activities (Benevenuto et al., 2009; Chen et al., 2019; Crawford, 2011; Kushner, 2016; Morrison et al., 2013). It has been estimated that in the context of social media, lurking practices represent 92% of all user actions (Benevenuto et al., 2009). However, unlike posting, lurking cannot be 'easily listened to'. Because of this, marketing practitioners and researchers may be overlooking a significant proportion of their audiences or may be

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misled by visible engagement indicators. As Arvidsson and Caliandro (2016) argue, social media brand communities operate under specific conditions, where consumers' participation is not based on interactions but on a continuous focus of interest (Arvidsson & Caliandro, 2016). In such communities, or 'brand publics' (Arvidsson & Caliandro, 2016), consumers' reactions to marketing communications are scarce, and conversations among community participants do not occur in public but happen in private spaces, invisibly (Rosenthal & Brito, 2017). Making these invisible practices visible is important given the abundant evidence linking these to all sorts of actions that feed into consumption-oriented behaviour, from stimulating consumer desire (Belk et al., 2020; Denegri-Knott et al., 2013; Kozinets et al., 2016), decision-making (Ashman et al., 2015) and sustaining brand relationships (Kefi & Maar, 2020), to developing competency in all sorts of everyday practices that can generate value for brands (Schau et al., 2009).

The aim of this paper is to put forth a fit for purpose methodology that can help make visible lurking practices, which are both pervasive and important sources of insights for practitioners and academics alike. At present, previous studies analysing lurking and other digital practices are based on conventional research methods, such as qualitative interviews (Leban et al., 2020; Nonnecke & Preece, 2001), online surveys (DeVeirman, 2016; Kefi & Maar, 2018; Ridings et al., 2006), experiments (Schlosser, 2005) or diaries (Rohm et al., 2013). Whilst these are valuable sources of insight in that they provide experiential and first person accounts, they do so in a retrospective way, where lurking practices are described based on past recollections. Alternatively, studies that work with data gathered in natural settings tend to make sense of lurking practices based on visible posting data (e.g. Culotta & Cutler, 2016).

A well-documented problem with these types of methodological interventions is that they do not allow researchers to directly observe lurking practices in their natural settings and

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in real time (Fahrenberg et al. 2007; Stone & Broderick 2007). The data generated, as a result, lacks *ecological validity*, because it may be riddled with personal biases, such as participants only reporting on what seems more socially desirable (Gandini in Denegri-Knott et al., 2020), important, recent or unusual (e.g. Donaldson & Grant-Vallone, 2002; Gorin & Stone, 2001). The problem with this is that the data collected does not deliver the required authenticity to fully understand lurking. Other related concerns are that motivational intentions behind those actions are inferred or undisclosed, and that contextual factors - what happened before and after the participant performed an individual action - are not accounted for, thereby limiting our understanding of what meanings people assign to their lurking practices or how they unfold. To address this, we introduce a novel methodological framework that we call 'Digital Practices Tracing' (DPT from now on). Specifically, the DPT framework combines digital methods (Rogers, 2013) with post-phenomenological inquiry (Verbeek, 2016), which enables the capture of lurking practices as they occur naturally by taking advantage of tracking devices and their contextualisation via follow-up post-phenomenological interviews. We deem DPT a useful tool to study lurking practices and other digital practices since it affords researchers the ability to systematically observe and analyse them as they unfold in their natural settings and in (nearly) real time – thus granting *richness* and *ecological validity* to findings (Hammersley & Atkinson, 2019), without denying consumers' voice and meaning-making.   Thus, our proposed tool contributes to research on lurking practices, and more broadly to marketing and consumer research, in several ways. First, it provides the reader with a very detailed research protocol for implementing the DPT framework. This protocol – which is based on a pilot study that we conducted to develop and test our methodology – provides researchers with both technical instructions for digital data collection and analytical directions for datasets generated. Specifically, it consists of six key steps: 1) defining research objectives and questions; 2) capturing lurking and other everyday digital practices through a

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set of screen-recording and tracking devices; 3) watching video recordings and taking field notes; 4) transforming unstructured video data into structured data by using ad hoc coding categories; 5) triangulating observational data with post-phenomenological interviews with participants in order to understand meanings and motives behind actions observed in the screen recordings; and 6) analysing and interpreting quantitative and qualitative data generated. Second, it provides a taxonomy of lurking practices as they occur in real time in their natural environments. The taxonomy distinguishes three main practices and a set of related actions: 1) *See* (stop on the post, browse multiple images, expand text, pause the story, watch the whole video, zoom the picture); 2) *Search* (social search, browse profile page, click and redirect, related online search; 3) *Save* (take a screenshot, save post, share privately). This taxonomy helps make invisible practices of lurking visible by making them observable, traceable, and measurable. In addition to this, drawing on interview data, the article provides a second taxonomy of motives and meanings underpinning these practices (e.g. privacy concerns for *See*; decluttering for *Search*; consider purchasing for *Save*), which helps to better contextualise them.

The paper is organised as follows. We first review methodological approaches to study lurking practices commonly used in marketing and consumer research literature. Then, we discuss the proposed methodology in the context of digital methods and screencast videography. Next, we outline a step-by-step research protocol of DPT, while demonstrating implementation of each step in our pilot study on lurking practices in relation to brand-related content on social media. And finally, we discuss how and to what extent the DPT framework can be implemented to study a wider range of consumer digital practices that go beyond lurking.

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Researching Lurking: the State of the Art

The importance of invisible practices has been highlighted by recent studies on participatory culture showing that a significant part of social media actions happen 'below the radar' (Boccia-Artieri et al., 2021). That is, invisible digital practices consumers carry out to circumvent social media algorithms, interfaces, and metrics (Rogers & Niederer, 2020). These actions usually happen in private groups, locked platforms, or through usage of ephemeral content (Abidin, 2021). Campbell (2015) broadly conceptualised this trend as 'network privatism', a scenario in which individuals use social media to connect with their closest peers at the expense of public actions.

However, research on lurking is to a large extent constrained by methodological limitations that do not allow researchers to easily observe what users do beyond what is made visible by the metrics of the digital interfaces (see Table 1 for a comparative overview). As a result, the most commonly used instrument is self-reporting through interviews (Nonnecke et al., 2006; Nonnecke & Preece, 2003; Ridings et al., 2006; Soroka & Rafaeli 2006) and questionnaires or surveys (DeVeirman, 2016; Fernandes & Castro, 2020; Ridings et al., 2006). These methodologies provide an individual self-assessment of lurking, however they cannot capture the granular detail of lurking as it occurs *in vivo*. In order to gather data that more precisely captures lurking in a natural setting, several studies had participants write diaries documenting their social media activity with respect to a particular brand or a community (Hartmann et al., 2015; Risi et al., 2020; Rohm et al., 2013). Interviews, surveys, or diaries provide rich content from which important insights can be drawn, but they are limited in that they are contingent upon what participants decide to disclose and in their subjective interpretations of their own practices. To obtain less biased data on lurking, experimental design (Schlosser, 2005) can help shed light on participants' practices when performing a single task assigned to them. Such an approach is suitable for comparing

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practices between distinct groups of users (such as lurkers versus posters) however does not make it possible to study the larger context of lurking practices (what happened before and after the participant performed the assigned task) or capture lurking practices as they occur naturally over an extended period of time.

To capture the full extent of individual browsing, screencast videography has also been employed, mainly in the field of website user experience (Kawaf, 2019). Screencast videography may record a wide range of individual practices by filming individuals while using a computer or mobile device, capturing eye movements and recording actions such as mouse movements or screen touches. However, due to technical limitations, this methodology has so far been used mainly in laboratory conditions (e.g. Kawaf, 2019), making individuals perform given tasks rather than letting them use devices and platforms naturally in real-life conditions.

To study lurking practices in the natural digital environment, other studies have used digital and computational tools. The use of such approaches is grounded on the assumption that lurkers' practices can be inferred from their active connections (Culotta & Cutler, 2016; Gong Wei et al., 2015) or understood based on comparisons to posters (Manchanda et al., 2015). Whilst these methods represent a novel and productive means to gain access to invisible practices without the limitations of self-report tools, their main drawback is that they understand lurkers as antipodes of posters rather than individuals with interests and preferences that seek and interact with relevant content. As a result, by inferring individual practices and preferences from active users rather than collecting data directly from lurkers, the amount and depth of insight obtained from research into complex lurking practices remain rather limited.

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Table 1. Methodological approaches to study lurking practices in marketing and consumer research

Methodological Approach	Key Studies	Dataset	Analysis	Type of digital practices studied	Evaluation (+/-), capacity to study lurking practices
In-depth interviews	Nonnecke et al., 2006; Nonnecke & Preece, 2003; Ridings et al., 2006; Soroka & Rafaeli, 2006	Interview transcripts	Content analysis Data interpretation	Full extent (posting and lurking)	(+) uncover motivations behind (lurking) practices, understand context (-) rely on participants' memory and self-selection of facts to disclose
Quantitative surveys	DeVeirman, 2016; Fernandes & Castro, 2020; Ridings et al., 2006; Kefi & Maar, 2020	Survey replies	Statistical analysis	Full extent (posting and lurking)	(+) potential for large-scale research, quantitative analysis of data (-) limited ability to understand complexity of digital practices, their motivations and context, rely on participants' self-report
Focus groups	Schivinski et al., 2016	Focus groups transcripts	Content analysis	Full extent (posting and lurking)	(+) uncover motivations behind (lurking) practices, understand context, stimulate discussion (-) rely on participants' self-disclosure
Experiments	Schlosser, 2005	Pre- and post-experiment data (e.g survey replies), natively digital data (for posting practices)	Statistical analysis, content analysis	Full extent (posting and lurking)	(+) simulation of a real-life situation; can explore practices in relation to specific tasks (-) laboratory conditions, short time span, documentation of lurking practices rely on self-report
Diaries	Hartmann et al., 2015; Risi et al., 2020; Rohm et al., 2013	Diary entries	Content analysis	Full extent (posting and lurking)	(+) potential to capture digital practices in real time (-) rely on participants' self-report
Computational techniques	Culotta & Cutler, 2016; Gong Wei et al., 2015	Publicly accessible digital data, non-direct	Data mining	Lurking practices	(+) large-scale, natively digital data (-) making assumptions about lurkers' practices

					from their active network connections rather than studying lurkers' own practices
Statistical modelling	Manchanda et al., 2015	Field data, e.g. transaction data and online community participation data	Statistical analysis	Posting practices, purchase behaviour	(+) large-scale, natively digital data (-) treating lurkers as antipodes of posters
Screencast videography	Kawaf, 2019	Video recordings	Content analysis, UX analysis	Full extent (posting and lurking)	(+) rich, contextual data (-) data gathered in laboratory conditions

As we can observe from a comparison of existing methodological approaches (see Table 1), methodologies employed in the extant research on lurking have had a key role in shaping the research agenda. For example, interviews have placed emphasis on the inner world of lurkers (and posters), while exploring characteristics of lurkers (Nonnecke et al., 2004), motivations and drivers behind lurking practices (e.g. Soroka & Rafaeli, 2006; Nonnecke et al., 2006; Ridings et al., 2006; Fernandes & Castro, 2020; Kefi & Maar, 2020) or comparing lurkers with posters (e.g. Morrison et al., 2013; Schlosser, 2005). Surveys, on the other hand, have been used to assess the effects of lurking (and posting) (e.g. Fernandes & Castro, 2020). However, due to the methodological limitations of tools used so far, decoding of actual lurking practices has not been sufficiently addressed in the extant research. Recently, Leban et al. (2020) attempted to categorise lurking practices in relation to luxury content on social media into four practices, namely 'compassing, curating, collecting, and conversing'. Their classification provides insights into social media content-related actions, however it does not capture the fine detail of individual lurking actions. Therefore, researchers still know little about the types of actions making up lurking practices, their frequency or the context in

which these unfold from everyday online navigation on networking sites or across digital platforms.

This review of current research into online lurking provides three insights. First, the research on lurking has not yet detailed lurking practices and its constituting actions. Second, current methodological approaches satisfy one of two desired qualities of research data, either its *richness* or its *natural character*. And third, research on lurking is underdeveloped in consumer and marketing research, particularly in the context of social media engagement with brand-related content. Research in this domain relies almost exclusively on active participation data which represents only a minority of consumers using social media. This raises questions about the reliability and significance of researchers' conclusions and efficacy of marketing recommendations derived only from such data.

Instead of dividing consumers into two distinct groups of active and passive members, we follow Ellison and boyd (2013) and approach social media participation through an action-centric analysis and focus on practices rather than type of users. This development towards a more granular understanding of user actions follows the evolution of internet research that has progressed from global measures, such as time spent online, towards consideration of specific actions on site (Ellison & boyd, 2013). Using such an approach, we show that lurking is not limited to passive consumption of online content and that lurkers are actively engaged with digital content although not in a public way.

Methodological Framework

Follow the Medium and Follow the Users

In this article, we introduce a novel methodological framework to study lurking practices *in vivo* within digital environments that we call 'Digital Practices Tracing' (DPT). This framework is positioned within the broader paradigm of qualitative digital methods

(Caliandro & Gandini, 2017). Qualitative digital methods enable researchers to combine digital methods with qualitative techniques of data analysis (such as online observations, interviews or qualitative content analysis) to better make sense of and contextualise user actions captured by computational techniques typically employed in digital methods research (Niederer & Colombo 2019; Denegri-Knott et al., 2020; Vicari & Kirby, 2022). Specifically, our DPT framework integrates digital methods (Rogers, 2013) with post-phenomenological enquiry (Ihde, 1990; Verbeek, 2016), recognising both digital and consumer intentionality and agency in the enactment of lurking.

The term 'digital methods' describes "the deployment of online tools and data for the purposes of social and medium research. More specifically, they derive from online methods, or methods of the medium, which are reimagined and repurposed for research" (Rogers, 2017, p. 75). The digital methods paradigm is premised on the principle of *follow the medium*, that is to take advantage of natively digital methods that digital environments, such as search engines or social media platforms, employ to gather, order, organise, rank, and rate digital data – as with APIs, algorithms, tags, likes, RTs or hashtags (Rogers, 2013). Therefore, by *following the medium*, it is possible to observe how digital infrastructures shape processes of communication and interactions unfolding within online spaces. Digital methods have typically been applied to explore how digital infrastructures influence the online circulation and discussion of political issues (Marres & Moats, 2015; Venturini, 2012) as well as the politics of digital platforms (Rieder et al., 2018). However, a more recent strand within digital methods exhorts researchers to pay attention to how users use digital infrastructures to attain specific communicative goals (Bruns et al., 2016). In order to fully and properly integrate qualitative techniques of data analysis and interpretation within the digital methods paradigm, Caliandro (2018) proposes to *follow the user* (along with the medium). *Following the user* requires the following. First, it means observing how users use/manipulate digital devices and

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environments. For example, Twitter studies (based on qualitative content analysis) provide many examples of how different online groups use the same features (like hashtags) to bring into existence very different kinds of social formations (like communities, publics, or crowds) (Arvidsson et al., 2016; Gruzd et al., 2011). Second, *following the users* means making them (and/or research participants) your co-researchers in order to, for example, interpret the meaning of certain digital data or digital tools outputs which would otherwise not be intelligible. To illustrate, Caliandro et al. (2021), who studied the digital practices of a small group of older people via ad hoc tracking devices installed on their smartphones, acknowledged the importance of combining digital methods with face-to-face interviews. Using a complementary qualitative method allowed them to correctly assign meanings to outputs generated through tracking devices, which would be very difficult, if not impossible, to understand, such as dramatic drops or increases in participants' smartphone activity. Third, *following the user* means taking advantage of natively digital methods through which internet users manage their own digital data. For example, Bainotti et al. (2020) relied on internet users' methods to capture (ephemeral) Instagram stories, by using an online scraper that Instagram users customarily employ to archive their own stories.

The DPT framework combines *follow the medium* and *follow the user* approaches by using ad hoc tracking devices to capture participants' digital practices within social media platforms, while seeking their own accounts and interpretations of the data gathered. Also, we paid particular attention to our 'participants' methods' (e.g. screen grabbing), which we repurposed to build our taxonomy of lurkers' digital practices. We argue that paired with the *following the medium* approach (Rogers, 2013), which follows the logic of the Internet to extract and analyse digital data as it appears (such as links, posts, likes or hashtags), the strategy of *following the user* brings to the fore less visible social media practices that are crucial to understanding digital practices in a more comprehensive and naturalistic way. As

Costa (2018) emphasises, studying user practices as they occur in everyday settings is critical in order to uncover the full scope of practices but also acknowledges the importance of consumers' own interpretations and reflections of their mediated practices that can bring a more accurate and nuanced understanding of those practices. The reflective account of lurking practices can locate those behaviours within the broader history of individual actions from which their significance can be glimpsed (Thompson et al., 1989). In this regard, while digital methods can provide us with real-life, real-time detailed descriptions of digital practices, do not reveal consumers' underlying goals and meanings assigned to those practices. To achieve this, we suggest adopting a post-phenomenological orientation. The choice of post-phenomenology follows recent calls made to ameliorate the effects of over emphasising digital agency (as may be the case with digital methods) with interventions that are better attuned to showing how consumers perceive and give meanings to forms of digital agency that they encounter in their digital media use (Costa, 2018; Belk, 2014; Gandini in Denegri-Knott et al., 2020). Like phenomenology, post-phenomenology is committed to studying the lived experience, but acknowledges the importance of technology in shaping or mediating individual perceptions, interpretation and actions (Verbeek, 2016). Importantly, it also acknowledges people's interpretative agency in how and why they use technology, and the meanings they ascribe to their usage (Verbeek 2016). From a post-phenomenological perspective, each digital media platform has a distinct agency or intentionality (see Ihde, 1990), in that they invite or encourage how they are to be used (consider for example Facebook, which constantly urges users to disclose their thoughts and experiences through the preformatted prompt 'what is on your mind?' or follow pages that 'they may like'; Van Dijck & Poell, 2013). Consumers, however, also have intentions or underlying motivations, which in turn shape how platforms themselves and features within them (liking, sharing, commenting) are perceived and used. This recognition sensitises us to understanding why

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consumers lurk - when they search and save brand content they have an affinity with, instead of 'liking' (something afforded by the platform). While the approach is new to consumer and marketing research, it is very well established in science and technology studies, and design and engineering where it has been successfully used to study user experience in virtual reality (Vindenes & Wasson, 2021) or the role of design (together with functionality) in wearable technologies (van Dongen et al., 2019).

Therefore, our proposed methodology requires an integrated use of digital methods and post-phenomenologically informed face-to-face interviews (Ørmen & Thorhauge, 2015). Doing so helps researchers to make sense of data gathered from tracking devices (e.g. why is there a spike in PC use on Wednesdays?), figure out patterns of online navigation (e.g. why does consumer X always access Facebook first, then Instagram, and then Twitter?) or to understand the motives behind the use of certain applications (why is consumer x's use of TikTok so prolonged?).

Following Lurking via Digital Practices Tracing

To devise our methodology, we drew inspiration from online ethnographic approaches, such as netnography (Kozinets, 2002), at the core of which lies observation. However, we follow Kozinets et al.'s (2018) suggestion to integrate netnography with digital tools of data analysis and collection (Reid & Duffy, 2018). In our approach, we build on observational ethnographic research, where the use of video capture has proven to be an effective way for documenting and understanding everyday practices and rituals (Figeac & Chaulet, 2018; Pink, 2007). We complement this form of data collection with the use of tracking devices to record digital practices as they naturally occur in real time. It is important to note that doing observations of social media actions via tracking devices and screen recording cannot be considered a netnography per se, since there is no 'real' immersion in participants' natural environment,

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nor direct engagement or interaction with them within such an environment (Kozinets, 2010). Notwithstanding, we approached the analysis of our data by retaining an *ethnographic sensibility* (Hine, 2015), since we: a) (virtually) followed the participants' online everyday practices by means of tracking devices; b) directly observed the participants' online everyday practices thanks to the video recording outputs released by the tracking devices and c) engaged with participants in follow-up post-phenomenological interviews to contextualise observations and reveal underlying motivations (Pink & Morgan, 2013; Caliandro et al., 2021). Given that through our method, we do not intend to study online communities, but rather individual practices in relation to brand content, the methods proposed cannot be assimilated to netnography (or ethnography in general). Therefore, we situate our methodological approach alongside qualitative digital methods, digital tracking techniques, and videography.

To follow users, screencast videography, a qualitative method that has the ability to produce detailed records of lived experience in the digital environment in its dynamic form (Kawaf, 2019), can be effectively used. A key benefit of videography is contextual data that captures consumers' digital practices in its natural milieu in an unobtrusive way, making it easier to reconstruct and understand everyday practices like lurking. So far, video-based observation methods have been used to study how people interact with technology in a naturalistic way, such as studies assessing usability and user experience (Kawaf, 2019; McMillan et al., 2015) or computer use in the workplace (Ruhleder & Jordan, 1997; Tang et al., 2006).

In order to study the full scope of consumers' individual practices, including lurking, screencast videography with digital methods (Rogers, 2013) can be productively combined. Specifically, this allows for the collection of 'natively digital data' (Caliandro & Gandini, 2017) - data generated through diverse digital devices, such as data from social media

platforms, database research, and generated by smartphones, personal computers, or sensors, captured through methods that are incorporated in mobile and computer devices. By using digital methods of data collection, our proposed methodology enables the capture of consumers' individual practices in their natural settings and as they occur in everyday life, without the need to resort to experimental designs (McMillan et al., 2015; Tang et al., 2006). This is possible through screen capture software and digital tracking devices that capture participant data in real time in ways that can be easily retrieved by the researcher.

Increasingly, tracking devices are commonly used in social sciences to access digital everyday actions that would be impossible to observe otherwise (Stier et al., 2020; Ohme et al., 2020). For example, tracking devices have been used to monitor patterns of smartphone use (Rosales & Fernández-Ardèvol, 2019), the movements of the eyes on screens (Muñoz-Leiva et al., 2019), the use of digital media in different locations within a household (Aipperspach et al., 2006), or customer movement within stores (Grewal et al., 2018). The use of tracking devices for consumer and marketing research has several advantages. Specifically, it permits researchers to: a) observe consumers' everyday digital practices that are otherwise invisible (e.g. number of times a user accesses a smartphone in a day); b) get very granular data that would not be possible to obtain through traditional/analog methods (e.g. number of seconds a user spends on a given smartphone app each time they access it); c) overcome the chronic errors of over/underestimation when measuring everyday digital practices with traditional/analog methods, such as self-tracking sheets (Boase & Ling, 2013) (e.g. it is very unlikely that an interviewee would remember exactly the amount of time spent on a smartphone over the period of a week and/or the number of apps daily accessed).

However, the use of tracking devices has drawbacks too. Their employment, especially in relation to the processing of large video data, may strain data storage limits, data transmission rates, and processing power (McMillan et al., 2015). Therefore, the role of

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tracking devices in the proposed methodology is to help automate the process of data capture -
the sharing, storing and deletion of large video data sequences generated by participants'
devices. As a result, tracking devices make it possible to use both big data files and simplify
participants' involvement in recording their normal online behaviours with least disruption.

The output of the data through screen recordings raises another challenge linked to the
analysis of unstructured video data. To overcome this, the analytical method we propose relies
on interactional video analysis principles (Heath et al., 2010; McMillan et al., 2015) adapted
for human-computer interaction settings. Interactional video analysis draws on conversation
analysis and ethnomethodology and focuses on the detailed analysis of interactions and
activity (McMillan et al., 2015). Following this approach, Heath et al. (2010) propose three
key analytic orientations (Garfinkel 1967; Sacks 1992), from which to view 'naturally
occurring' actions and events. The first one is *gesture*, which comprises actions such as page
scrolling and browsing, cursor motions and clicks. These actions are considered as the
primary vehicles by which people demonstrate their preferences in the real world, such as
pointing and referring to objects in an interaction. Secondly, the *significance* of interactions
and actions refers to the importance of those actions, i.e. prevalence or the context in which
they occur. And thirdly, the course of the user's actions and the sequence of interactions
reveals the *context* in which the interactions and actions take place. As we will show in the
next section, these three analytic orientations are helpful to orient the observation and the
analysis of screen-recording outputs.

Finally, screen-recordings should be followed by face-to-face interviews so that
meanings, motives and intentions behind digital practices observed in the video recordings
can be gleaned. Without participants' interpretations of their practices through interviews, the
meanings attributed to actions would be lost. An optimal interview format is semi-structured,
since it permits interviewees to freely express themselves while touching all those topics that

are relevant for the research project (Denzin & Lincoln, 2011). In the next section, we detail

our DPT methodology by devising a research protocol that includes both technical

instructions for the digital data collection and analytical directions for the acquired data set.

Digital Practices Tracing Research Protocol

In order to illustrate our research protocol we draw on a pilot study undertaken on lurking

practices in relation to brand-related content on social media. The protocol articulates through

six key steps that we illustrate in detail (see Figure 1).

Figure 1. Schematic diagram of the DPT protocol
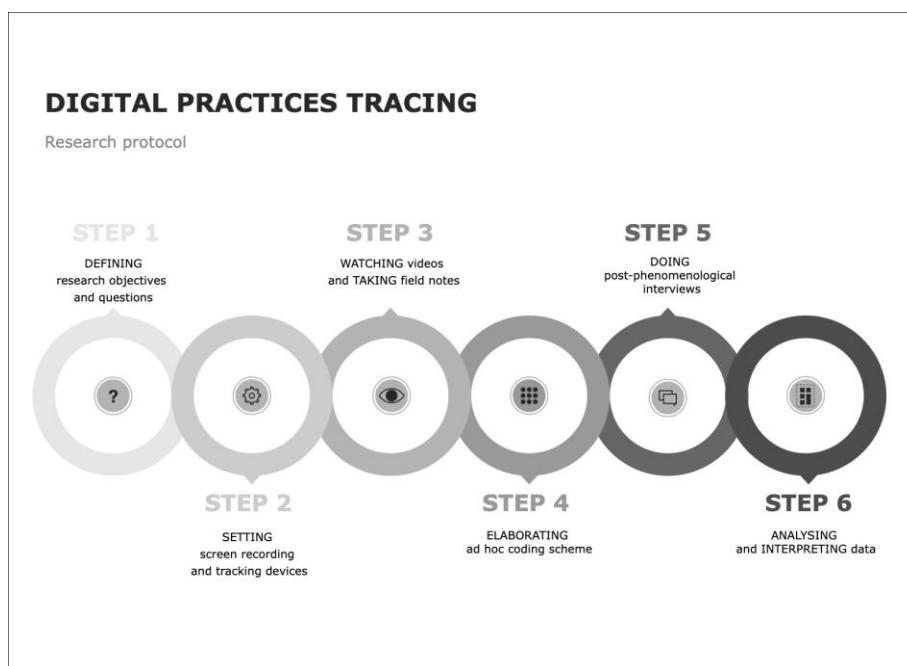
STEP 1: Research Objectives and Questions

The primary point of departure when setting up a specific software solution for remote data collection through screen recordings is to define the objectives of the study and research questions. DPT is best suited for studying practices in various digital settings in relation to specific topics or contents, such as groups or communities, practices of specific demographic groups, changes in practices over time, or motivations behind certain practices. In our case, we decided to set our research project within social media, with the aim being to study lurking practices around brand-related content. Specifically, our research project aimed to answer the following research questions: *What are the digital practices of lurking? What are the types and frequency of consumers' lurking practices in relation to brand-related content encountered on social media? What are the main motivations behind specific brand-related digital practices?*

STEP 2: Setting Screen-Recording and Tracking Devices

Scope of Data Collection

Depending on the research objectives, the scope of data collection may differ significantly depending on technological, behavioural and task-related aspects. Technological requirements refer to decisions regarding devices, operation systems, digital platforms or applications that should be included in the research. The behavioural concerns comprise decisions on whether to include mouse movements, screen touches or audio narration. And lastly, the task-related requirements include decisions on what scope of participants' navigations should be recorded, ranging from complete navigations to specific actions. When deciding on the scope of data collection, it is important to consider technical and analytical implications. In our study, we decided to track both mobile and desktop devices in order to capture lurking practices in relation to brand-related content in its full complexity (Madianou & Miller, 2013). The

primary focus of the analysis of lurking practices was social media platforms. However, to capture potential brand-related activity on the Internet, we asked the participants to also record their online browsing. The screen capture software recorded the participant's full screen mouse movements on PCs, and screen touches on mobile devices. Neither audio or the participant's face were recorded.

Screen Recording Software

The choice of which screen recording software to use depends on the operation system of devices to be monitored and research budgets. It is possible to use freely available software (e.g. FreeCam, ShareX or TinyTak), however there may be limitations imposed; for example the number and type of devices and operation systems that can be used, time limits and restrictions to the size of video files that can be captured. Another viable choice is opting for licenced software which affords all sorts of functionality or choosing restricted free versions made available by the provider (for example Camtasia, FlashBack, OBS studio, ApowerREC). A third option is to use the screen record function that is built into participants' devices. In our study, to record actions from PCs and smartphones operating through the Android system, we used a free application: ApowerREC. ApowerREC allows users to easily record their screen actions and keep track of their screen time. For the iOS devices, we had an application developed by a professional programmer, which employed the built-in screen recording function in the iOS mobile devices, and reproduced the video management functionalities of ApowerREC.

Files Storage/ Repository

An important aspect of data collection is to set up a suitable data repository of adequate capacity for the collected video data files. A convenient solution is cloud storage, such as Google Drive, OneDrive or Dropbox. It is important to mention that both the researcher as well as the research participant must have access to the chosen cloud service with sufficient

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storage capacity. The researcher needs to have an adequate capacity for all videos collected. The participants need to have enough storage capacity to store at least two days of their video recordings to ensure that all videos are saved on the researchers' drive. It is important to note that a single video may take up to 4GB of storage. In our study, Google Drive was selected as the main repository for the video files because it afforded unlimited storage capability and was accessible to most participants.

Tracking Devices

The role of tracking devices is to allow remote data collection, help automate the process of data capture, and reduce disruption to participants' normal usage of their devices. Specifically, their function is to localise the screen recordings on the participant's device; automatically upload each screen recording to a selected repository at a given time (e.g. overnight, when the participant is least likely to use the device) or under given conditions, such as when Wi-Fi connection is available in order not to deplete participant's mobile data; and to delete the uploaded files from the participant's device so that they do not take up internal storage capacity. There are a number of synchronisation software that can be used for free such as functions: FolderSync, GoodSync or Syncthing.

Thanks to tracking devices, the data in our study was automatically uploaded into a shared Google Drive folder and deleted from participants' devices. For Android devices we used the FolderSync application; for the iOS devices, FolderSync functions were reproduced in our own developed application. For PCs and Macs, the syncing functionalities were provided by the ApowerREC software.

Participants

The data collection process follows a participant-generated ethnographic approach, which is particularly convenient for observing social media usage which can occur anytime, day or night, and anywhere the participant goes, which would be impossible without the participant's

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cooperation. Therefore, selection of participants that are relevant to study but also open and willing to cooperate is essential. In our study, we decided to focus on Gen Z adults since they are familiar with digital media and more cognizant of their digital practices (Duffy et al., 2018) and therefore inclined to engage in lurking behaviours. The selection of participants was based on the set of criteria comprising demographic variables and social media usage. The target participant profile was defined as women and men between the age of 18 and 25. The criterion of social media usage required participants to have at least two active social media accounts and that they visit those platforms at least four times a week. To ensure that the participants met the specified criteria, they were given a screening questionnaire at the recruitment stage. Specifically, we held four university guest talks addressing media and journalism students that presented the study in general terms[1]. At the end of each talk, the students were asked to fill out an online questionnaire. As a result, we received 185 online questionnaires, out of which 76 respondents expressed their willingness to participate. Finally, 15 persons participated in the pilot study (see Table 1 for participants' characteristics). Of the reasons for non-participation that were provided, by far the main reason was privacy, followed by technical issues like battery drainage and reduced performance of the phone or usage of the employer's computer.

Ethical Considerations

Research employing screen recordings should follow ethical requirements related to big data research (e.g. Metcalf & Crawford, 2016) and big data ethics code of conduct (e.g. Zook et al., 2017). To do so, researchers need to commit to ethical standards in three major areas, which were the guiding ethical principles in our study. First, participants should fill in an informed consent form prior to data collection. Second, the data collected should be limited to

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[1] The guest talks were given at the Charles University and Metropolitan University Prague

addressing the research objectives. And third, every effort should be made to anonymize the data upon receipt prior to analysis.

Timeframe

Timeframe refers to the length of a single video recording and to the data collection time period. The length of individual recordings is dependent on the nature of the task requested by the researcher. This may range from days to months, however the longer the total period, the more precisely the scope of a single recording should be defined in order to reduce the possibility of having to cope with extremely large datasets. Also, researchers need to take into account the potential for participants' fatigue if the research period is too long. From our experience, we advise an optimal period of 1-2 weeks. In our study, we asked participants to manually open the application every time they started using social media and internet browsers and close it at the end of each session. Participants were asked to record their usage of social media and internet browsers over a one-week period.

Collected dataset

Depending on the task assigned to the participants, the length of the study and the individual participant's practices and approach to the study, the size of the collected dataset may vary significantly. In our case, the length of the screen recordings acquired from individual participants ranged from less than one hour to more than 30 hours (see Table 2), amounting to a total of 134 hours of video recordings obtained from 15 participants.

Table 2. Description of research participants and dataset

Participant*	Gender	Age	Total length of recordings (H:M:S)	Number of recordings	Period of data collection
Barbora	F	23	0:55:17	15	12/2018
Charlotte	F	22	6:43:27	70	12/2018
Chiara	F	24	1:18:32	12	03/2019
Katerina	F	23	2:12:42	30	01/2019

Katy	F	19	30:25:22	36	11/2018
Koen	M	20	1:54:16	17	11/2018
Maiju	F	25	8:23:38	45	11/2018
Marine	F	22	0:53:52	15	12/2018
Marion	F	23	7:46:52	39	11/2018
Marketa	F	20	4:31:49	81	11/2018
Samy	M	20	16:50:21	38	11/2018
Stefanie	F	25	6:02:07	51	11/2018
Simon	M	18	6:29:23	27	11/2018
Stepan	M	22	20:36:47	40	02/2019
Valerie	F	22	18:57:14	192	12/2018
TOTAL			134:01:39	708	

*The listed participants' names are pseudonyms.

To navigate and make sense of the vast and complex material gathered through video-recording techniques, we developed an ad hoc extraction and transformation scheme to systematically explore the data collected. This process required two steps: *watching videos*, and *coding*, which we describe in detail in the following paragraphs.

STEP 3: Watching Videos and Taking Field Notes

The initial stage of the video analysis requires that the researcher becomes familiar with the contents of the screen recording. This phase involves playing and replaying the videos to understand and identify recurrent patterns in participants' practices, while taking field notes. Following a *grounded* and *iterative* process (Glaser & Strauss, 2009), this phase allows for the organisation of different patterns observed into ad hoc coding categories. The construction of categories should have an ethnographic purpose (Altheide, 1987), that is it has to provide a tool to better frame, interpret and describe the different practices as observed in the screen recordings. Moreover, the construction of categories is crucial for transforming the non-structured video data into a structured dataset, which helps to better navigate the dataset; also the categories serve as linking points with the analysis of interviews.

In our study, we first had to determine what brand-related content is. For this we drew on Asmussen et al.'s holistic definition of brand content as "any manifestation associated with a particular brand in the eye of the beholder" (2016, p.10) - whereby the term 'manifestation' is intended as "any perceptible outward expression of the brand" (Asmussen et al. 2016, p.10). According to this definition, brand content can fall into a broad spectrum of 'digital objects', from a price promotion offered by a company to a picture depicting a product on Instagram. They can be supplied by a heterogeneous set of stakeholders, such as companies, influencers, customers, etc. Such a broad conceptualization helped us to remain open to whatever manifestation of digital branded objects we could run into during our observations. Then, we played and replayed the videos in order to understand and identify recurrent behavioural patterns. To avoid 'getting lost' in hundreds of hours of recordings, we used Heath and Hindmarsh's analytic orientations as *sensitising concepts* (Blumer 1954) to navigate the videos. That is, we paid particular attention to the *gestures* and *significance* of our participants' actions as well as the *context* in which they were situated (for example, we focused our attention on what participants clicked to, with which frequency, and on what kinds of other actions followed the initial click). These sensitising concepts helped us to make sense of what we were observing as well as to elaborate on our own categories of analysis. Field notes were taken accordingly. After this phase, we started to organise the different patterns observed into an ad hoc coding scheme composed of a list of ad hoc categories. The construction of each category was discussed and negotiated between the authors during several sessions of discussion.

STEP 4: Elaborating an Ad Hoc Coding Scheme

To further explore the dataset and consider our initial observations, we came up with a set of categories that permitted us to systematically analyse lurking practices through a sequential

and iterative process of coding that was aimed at gradually simplifying the complex and unstructured format of our observational data. The aim of the analysis was to scrutinise the individual touchpoints with brand-related content on social media and related participants' actions. Specifically, we came up with a coding scheme that allowed us to categorise different digital practices enacted by participants around brand-related content and so to clearly distinguish between visible and invisible practices. This procedure permitted us to bring to light lurking practices, which we grouped into three main categories: *See*, *Search*, and *Save*. We now describe the process more systematically.

Our coding scheme hinges on a unit of observation that we call a *transaction*, which we define as any occasion in which a participant encounters a brand-related content on social media either through news feed, stories or social search. Each transaction was then coded into two categories: *description of the transaction* and *actions*. First, the 'description of the transaction' documented the participant's ID , date and time of recording, and indicated the time that the participant spent on a transaction, i.e., time measured from the moment when a participant came across the brand-related content post to the moment when the participant's focus on that particular brand content ended. The second part of the coding scheme, *actions*, documented participants' interactions with and around the brand-related content. An 'action' is defined as a single act that the participant performed in relation to a brand-related content, such as expanding the text of a social media post, zooming into the picture or browsing multiple images in a social media post. Unlike 'Description of transaction', which mostly served to give context to participants' actions, the category 'Actions' actually allows the researcher to make lurking practices visible. 'Actions' facilitate this because they distinguish between what is lurking and what is not, as well as identifying the main lurking practices. Therefore, since the focus of our study was on the types of lurking practices in relation to brand-related content, we paid particular attention to the *actions* performed in relation to

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brand-related content. Thus, we divided the category 'actions' into three sub-categories: 'no action', 'social engagement' and 'personal engagement'. 'No action' is self-explanatory. 'Social engagement' and 'personal engagement' are two types of behavioural responses defined by Calder et al. (2009) within a website context. Actions that are considered social are defined as publicly visible reactions to brand-orientated content. Within social media environments they are customarily measured through what Rogers (2018) calls *vanity metrics*, that is functions like 'retweets', 'comments', 'likes', 'following buttons', etc. Actions that are considered as 'personal engagement' include a large variety of actions that are not tracked by social media platforms' metrics and are normally 'invisible', spanning from simply stopping on the post (used for interrupted practices when participants scrolled through newsfeeds while keeping a fully visible post displayed on the screen) to expanding the text, to sending a screenshot to a friend. In our study, we were able to identify 14 discrete actions (see the full list in Table 3).

Table 3. Transformation of video data into a structured data set: a coding scheme

Description of transaction	Actions
Participant's code	No action
Date and time of the recording	Social engagement: • Like • Comment • Share • Follow
Action start time	
Time spent on a transaction	
	Personal engagement • Stop on the post • Expand text • Browse multiple images • Zoom in on the picture • Watch the whole video • Pause the story • Read comments • Browse profile page • Social search • Click and redirect • Related internet search • Screenshot

	• Save post • Send a screenshot / share privately with a friend

The very last step consists of focusing solely on the 'Personal Engagement' macro-category (putting aside 'Social Engagement') and then clustering its related actions in a set of new categories so that lurking digital practices can be described in greater detail. Specifically, we came up with three new sub-categories to better observe, track and measure lurking practices within social media environments. This further segmentation was necessary, since unlike 'social engagement' there exist no specific metrics to track lurking practices, so we needed to come up with ad hoc 'metrics' to fulfil this task. Specifically, the category *See* comprises all actions where sight is central such as looking, reading or watching (for example browsing multiple images, expanding text or watching a video). The category *Search* groups actions that are related to situations when a participant initiated further inquiries regarding the brand encountered on social media. This group of actions comprises redirections to brand websites through post clicks but also independent searches on the social media platform or parallel searches in the separate internet browsers. And lastly, the *Save* category groups actions that represent participants' intentions to set the brand-related content aside for future use (for example by saving a post directly on the social media platform or taking a screenshot; see Table 4 for further details).

Table 4. Taxonomy of lurking practices

See	Stop on the post Browse multiple images Expand text Pause the story Watch the whole video Zoom in on the picture
Search	Social search Browse profile page Click and redirect Related online search
Save	Take a screenshot Save post Share privately

Using this taxonomy helps identify users' touchpoints with brand-orientated content and scrutinise associated user actions with the aim of reconstructing consumers' digital practices.

STEP 5: Doing Post-Phenomenological Interviews

After the observation phase of the screen recordings, post-phenomenologically informed, semi-structured questions need to be asked to bring to the fore consumers' underlying motivations, encouraging reflections on what social media platforms afford or make more difficult. For this, it is advantageous to draw from Adams and Thompson's (2016, p. 17) heuristics so that the researcher can catch insightful glimpses of a specific technology in action. One heuristic that can be used is the gathering of anecdotes. For this, the researcher can bring data slices retrieved via screen recordings to the interview setting and ask participants to reconstruct what they were doing and why. Participants may also be asked to state what the digital platform used is encouraging or inviting them to do and what they avoid doing and why. Specific lurking practices can be followed by noting the different actions constituting them, paying attention to who is acting and what is being done, as well as to who may be excluded. Of value as well is asking participants to spell out the context in which

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lurking was happening (where they were, what they were doing and why) to better account for human intentionality (meaning and motivations) and the role of context in the actions documented. One last heuristic is that of applying the laws of media, which may bring changes in digital practices, like lurking, to the fore. For this, researchers can ask questions like: What is this platform enhancing, and what are you better at as a result of using it? What are you worse at?

In our case, the interviews were semi-structured, while individual adjustments were made to discuss specific participant's actions and researcher's preliminary constructs based on the analysis of the preceding screen recordings' data. Interviews with all participants took place over Skype and lasted approximately one hour. All interviews were recorded and transcribed. The data collected from the interviews were coded, organised and analysed using ATLAS.ti, version 8.3.1. The first step of the analysis was open coding, in which all relevant quotations were assigned some of the predetermined codes or newly created codes. Next, codes were grouped into higher-level categories based on connections and relationships among the codes. In the third step, the data from the interviews were interconnected and linked to the themes that emerged from the analysis of screen recordings in order to thicken the primary constructs and develop interpretations.

STEP 6: Data Analysis and Interpretation

Once an ad hoc coding scheme is constructed, there are many kinds of quali-quantitative analysis that a researcher can develop to explore lurking practices carried out by consumers. We provide a few examples that help us illustrate how DPT helped us answer our initial research questions: *What are the types and frequency of consumers' lurking practices in relation to brand-related content encountered on social media? What are the main motivations behind specific brand-related digital practices?*

Analysing Quantitative Data to Uncover Patterns in Practices

The very first thing that one can do is to simply explore the distribution of the coding categories, counting their occurrences in the dataset, beginning with the main categories and continuing with the sub-categories. Next, we explored the intensity of different actions by applying two metrics - time spent on a transaction and number of actions per transaction. And lastly, we attempted to contextualise the actions within the transactions and outline patterns of practices.

Distribution of transactions. To begin with, we explored the overall data set at the level of *transactions*. This view allowed us to measure how often a particular action occurs against total occurrences. In total, we extracted from the screen recordings 1805 transactions. In 55% of the transactions (a total of 994 transactions), participants did not perform any action, i.e. they skipped those posts. Social engagement was observed in only 53 transactions, accounting for 3% of the total data set of transactions. Personal engagement, i.e. *See*, *Search* and *Save* actions, on the other hand, were present in 42% of the total transactions, i.e. in 758 transactions.

Distribution of actions. In order to extract more insights from the data, a further distribution of actions needs to be carried out. In our study we registered 842 actions performed by participants in relation to brand-related content grouped in the categories of *See* (a total of 566 actions), *Search* (a total of 212 actions), *Save* (a total of 11 actions) and 'social engagement' (a total of 53 actions). This view gives us a sense of the distribution of the actions within the overall data set, pointing to the most frequent actions. The results of this

analysis not only demonstrate the prevalence of lurking practices within the data set, but are able to cast a light upon the specific practices and their relative frequency within the dataset.

Intensity of Actions. In order to get an understanding of the intensity of different actions, we derived two types of metrics: *time spent on a transaction* (i.e., time spent engaging with a brand-related content) and the *number of actions per transaction*. These metrics allowed us to compare and benchmark the intensity of actions related to one transaction. To offer an illustration from our study, for the transactions where the participant only stopped on the post, the average time spent was 6.7 seconds, compared to the 14.1 seconds for transactions where the participant stopped on the post and performed some additional action(s). The transactions with *Search* and *Save* actions showed an average time spent engaging of 30 seconds and 23 seconds respectively. The average number of *Search* actions per one transaction reached 1.8 actions, compared to only 1.1 of *See* actions. To compare, transactions that comprise some form of social engagement, mainly 'likes', the average 'time spent engaging' decreases to 18 seconds and to an average of 1.04 actions per transaction (meaning that in these transactions, the participants mainly only stopped on the post). This type of analysis can help researchers identify and compare different levels of participants' engagement.

Contextualisation of actions. The data extracted from the screen recordings can also provide a contextual understanding of individual lurking practices and indicate dominant patterns within them. To do that, we repurposed a Sankey diagram, a visualisation technique that helps display flows, which in this case was a series of *See*, *Search*, *Save* and social actions within a transaction (see Figure 2). For the purpose of this visualisation, we added the 'stop' node (referring to the action 'stop on the post'), which has been pulled out from the *See* category because it indicates an important starting point for other actions; however, it is not necessarily

followed by other actions. We used a number of transactions as a unit, while sizes of each node and edge are proportional to the number of transactions that flow through it. The order of the diagram represents the patterns in practices as observed in the screen recordings and captured through interviews[2]. This analysis helps uncover typical paths of digital practices. To illustrate, in our study, *Search* appeared to be an important practice in relation to brand content, occurring in 38% of all transactions (excluding the stop only transactions). Another insight is that in 42% of the transactions with 'social' actions, the liking action was the only additional action to stopping on the post.

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[2] For example, one of our interviewees (Charlotte) explained to us: *"I'm gonna stop scrolling, look at the picture and if this is a photo with details, I'm gonna zoom in. I'm gonna read the caption, and sometimes when there's a link, I click on it to see what this is about"*.

Figure 2. Contextualisation of actions, split of transactions into actions[3]
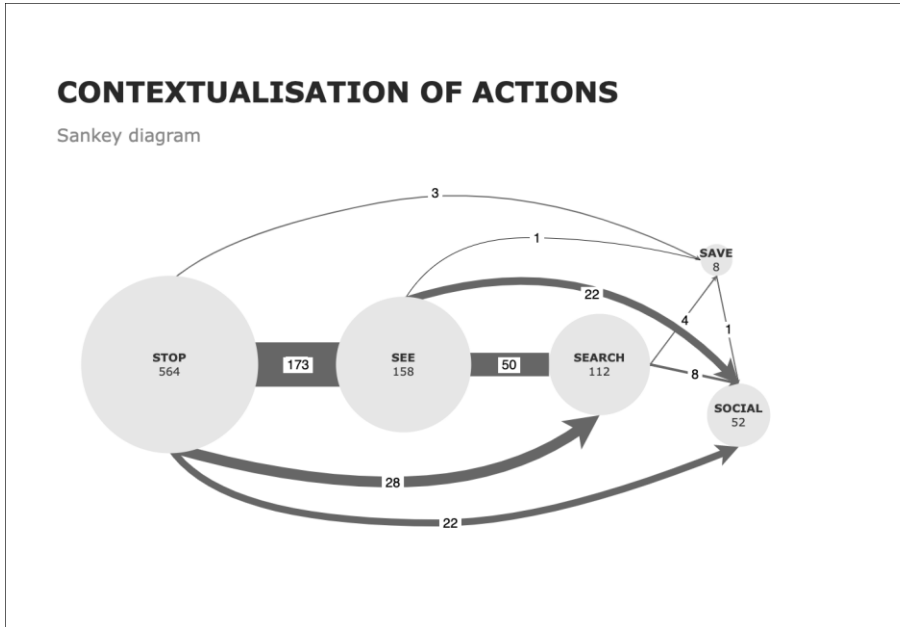
Analysing Qualitative Data to Understand Meanings and Motives behind Actions

A fundamental component of DPT consists of understanding the meanings and motives that participants assign to the categories explored quantitatively. Through post-phenomenological interviews, we can explore why participants performed certain practices as well as understand contextual conditions in which the practices were carried out. The following part presents a

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[3] The diagram visualises the split of transactions into actions and their absolute frequencies as coded in the data set. The nodes represent the actions categorised into *stop*, *see*, *search*, *save* and *social*. The *stop* node represents the action "stop on the post", which has been retrieved from the *see* actions to visualise the transactions, in which the participants either stopped on the post only without performing any additional action (in 338 transactions) or directly moved on to other actions (to *search* actions in 28 transactions or to *social* actions in 22 transactions) without performing any additional *see* action. The size of each node is relative to the number of transactions in which this action has been coded, while the number of transactions is indicated in each node. The size of the stop and search nodes also include the number of transactions that were not followed by any other action (338 and 34 transactions respectively). The edges depict the associations of actions within a transaction, i.e. it displays the number of transactions in which the participant used multiple actions, while the arrows show the order in which these actions appeared (e.g. in 173 transactions the participants performed some *see* action after *stopping on the post* or in 22 transactions the participants performed a *social* action (i.e., assigned a like) after having performed some of the *see* actions). The degree of thickness of each edge is relative to the number of transactions in which the two actions occurred (the exact number of transactions are indicated in each edge).

list of meanings associated with *See*, *Search*, and *Save* practices in relation to a large scope of brand-related content on social media, spanning from direct brand advertising to influencer marketing, as explored in our pilot study (see Table 5).

Table 5. Taxonomy of meanings and motives behind lurking practices

See	Search	Save
Privacy concern	Gathering information	Considering purchase
Caring about others' opinion	Being in the know	Seeking inspiration
Reluctance to be connected with brands	Decluttering	Daydreaming with friends
Boredom		Discussing with friends

See Category Meanings. Analysing the interviews, we discovered that four main motives behind the *See* actions exist, which are as follows: 'privacy concern', 'care about others' opinion', 'reluctance to be connected with brands', and 'boredom'.

- *Privacy Concerns.* First, the fact that participants do not interact publicly with branded content using visible social media metrics and instead engage by invisible actions does not necessarily mean that they are not interested in brands. As they explained, they rather fear that their public social media interactions with brand content might be revealing too much personal information or be misinterpreted, as Chiara said: *"I use Instagram as a lurker with a nickname so people cannot search for me. I use it to look at what I am interested in, like a peaceful place where nobody knows me and see what I am interested in."*

- *Care About Others' Opinions.* The second meaning assigned to actions was that the participants worry about the opinions of their friends and followers and therefore think

about what actions will be shown to them. This opinion resonated in Stepan's citation as follows: *"I think about what I 'like' and if it will be shown to my followers and friends."*

- *Do not want to be connected with brands.* Thirdly, through the *See* actions, participants claimed that it was possible to observe brands without having any lingering personal associations. To illustrate this point, Valerie said: *"I do not want to be associated with brands too much, on Facebook especially. So on commercial posts I do not react, I am really the observer."*

- *Boredom.* The last meaning assigned to *See* actions that we have noticed in the interviews was related to boredom and inefficient use of time associated with public interactions, as Samy described: *"I used to like everything that interested me, but in time, it became a bit boring to always spend time on liking the contents every time."*

Search Category Meanings. Through the interviews, we uncovered the following three meanings and motivations for *Search* actions: 'gathering information', 'be in the know' and 'declutter'.

- *Gathering Information.* The most frequently cited motivation for *Search* actions was information gathering. In this case, social media appeared to be the first point of contact with a brand, as Katerina said: *"When I hear about some brand, I first check it on Instagram. I wouldn't go first on their website. I first have a look if they have an Instagram account and what is its content."*

- *Be in the know.* Next, *Search* actions were used as an alternative to followership through which participants could get regular updates upon request. This is explained by Katy: *" I do not follow it [a brand], I look at it".*

- *Declutter.* Lastly, *Search* actions allow participants to declutter and clean their news feeds from the commercial messages, as Marketa explained: *"Brand profiles only sell products, they have nothing else to share. I do not like to repetitively hear about new shoes and new trousers for a certain price… If something interests me, I take a look at the brand profile, but I am not usually its follower".*

Save Category Meanings. Lastly, the interviews let us uncover four motives behind participants' *Save* actions, namely 'considering purchase', 'seeking inspiration', 'daydreaming with friends' and 'discussing with friends'.

- *Consider purchasing.* One of the most frequently mentioned motives for *Save* actions was to keep the selected posts as reference points for future purchases. Charlotte explained her thinking behind *Saving* as follows: *"Sometimes I see a product that I really like but don't want to buy at the moment so I save it as a photo or link on my browser that I add to my favourites.*

- *Seeking inspiration.* Another motivation assigned to *Save* actions was to gather collections of inspiring posts, as Marion described in the interview: *"I create folders and for example it's crafts, fashion, decorations, sportswear and something for my job and also cooking, I have folders with a mixture of these topics. And I'm just saving it."*

- *Daydreaming with friends. Save* actions like screenshots, were also mentioned as tools to daydream with friends. As Valerie explains: *"Happy Socks had a new collection of swimwear, which I unfortunately cannot afford, although I would like to..:) so I have a friend who loves Happy Socks as well, so I sent couple of screenshots, so we sent messages to each other dreaming about buying it…"*

- *Discussing with friends.* Lastly, *Saving* online content may also serve as a way of retaining discussion points for future in-person interactions with friends. Charlotte mentioned: *"When I see something on Instagram that I know that she would like, I save it and when I see her face to face, I show her and I review all the stuff that I saved for her over the course of time."*

Discussion and Conclusion

Methodologically, studies on lurking are based on interviews, online surveys, experiments, diaries or computational methods. A well-documented problem with these types of methods is that they do not allow researchers to directly observe lurking practices in their natural settings as they happen in real life and in real time. Collectively, these studies do not provide enough detail of actual practices as they happen, the context in which they occur and consumers' underlying motivations.

To overcome these limitations, this paper introduced 'Digital Practices Tracing' (DPT), a novel methodological tool that combines digital methods with post-phenomenological inquiry. We deem DPT to be a useful tool to study the full extent of consumers' digital practices as they occur in everyday life, since it allows researchers to observe and analyse them as they occur in their natural settings and in (nearly) real time –

thus granting ecological validity to the research insights generated in the process. In this article, we showed how the DPT framework can be a potent tool for studying lurking practices on social media. More specifically, first we provided the reader with a very detailed research protocol to put into practice the DPT framework. Such protocol offers researchers both technical instructions for digital data collection and analytical directions for the acquired dataset. The protocol consists of six key steps: 1) defining research objectives and questions; 2) setting screen recording and tracking devices to capture everyday digital lurking practices; 3) watching video recordings and taking field notes; 4) elaborating an ad hoc coding scheme to i) transform unstructured video data into structured data, ii) distinguish between 'visible' and 'invisible' consumer practices and iii) observe, track, and measure lurking practices (by taking advantage of the categories *See*, *Search,* and *Save*; 5) triangulating the observational data with interviews with participants in order to understand meanings and motives behind actions observed in the screen recordings; and 6) analysing and interpreting quantitative and qualitative data.

Second, we provided a taxonomy of lurkers' digital practices as they occur in real time and in their natural environments. The taxonomy distinguishes three main practices and a set of related actions: 1) *See* (stop on the post, browse multiple images, expand text, pause the story, watch the whole video, zoom in on the picture); 2) *Search* (social search, browse profile page, click and redirect, related online search; 3) *Save* (take a screenshot, save post, share privately). Not only this taxonomy is (to our knowledge) the first of its kind, but also it makes invisible practices of lurking visible – basically by making them observable, traceable, and measurable. Moreover, by taking advantage of follow-up post-phenomenological interviews, we provided a second taxonomy of the motives and meanings that lay behind these practices (e.g. privacy concerns for *See;* decluttering for *Search;* consider purchasing for *Save*). This second taxonomy is consistent with other studies that have also used interviews or

questionnaires to survey lurkers' motives and meanings. However, when paired with the first taxonomy, they produce a unique contribution to our understanding of lurking: consumers lurking are anything but passive, since they interact with brands through a very complex set of practical strategies and systems of meanings.

Practitioners too, must rethink the value attributed to visible engagement metrics as a proxy of consumers' real engagement with brands. Instead, other forms of engagement, at present dismissed or ignored because they are invisible, must be retrieved. As we have shown, lurking is not indicative of consumers' lack of interest. Indeed, the complexity and entanglement of lurking practices in consumer-brand interactions is such that their valorisation can help produce brand content that better aligns with consumers' needs. For marketing practitioners this pivot is vital. By uncovering how consumers interact with promotional content in ways that are naturalistic but 'hidden' to visible metrics commonly used in industry, this method can provide valuable insights that can be used to generate brand content that is relevant, audience-led and engaging.

The proposed methodology also opens up new possible research paths for studying lurking practices and other digital consumer practices that happen 'below the radar' of social media platforms (Abidin, 2021). This point brings us to another and more general contribution of this paper. DPT can be easily applied to the study of a wide range of consumer digital practices that go beyond lurking. For example, DPT can help marketing and consumer researchers better understand how consumers actually engage with digital content when carrying out digital practices, such as browsing for fun, shopping around, purchasing or co-creating practices with brands as content contributors. Beyond this, practice-oriented studies could document and theorise in much more empirical detail the role that digital media has in shaping and mediating everyday practices such as home decorating, parenting or meal preparation. This can be done with an unprecedented degree of precision in capturing

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constituting actions without compromising consumers' voice and intentions, whilst also being able to capture the role of technological intentionality in the shape of algorithms and platform affordances. To be able to do this concurrently would supplement studies which have historically relied on consumers' accounts of their lived experience only, without consideration of platform affordances in shaping those experiences. Collectively, studies in these areas still depend on retrospective data gathered through qualitative interviews, so the scope of enhancing knowledge in these discrete areas of research could expand significantly, emboldened by the new research questions our framework affords. For example, DPT can be used to re-map consumers' decision-making journeys and help track changes over time and in vivo. These studies in turn can supply insights into new sources of influence, stages in decision-making and new means through which e-word of mouth spreads. It can also help better understand the mediating role of digital media, in particular algorithms, in shaping consumer taste and choice-making by facilitating granular vistas of action sequences.

More broadly, our DPT framework can be fruitfully applied to the emerging fields of *algorithmic consumer culture* (Carah & Angus, 2018; Airoldi & Rokka, 2022) and/or *algorithmic resistance* (Velkova & Kaun, 2021; Risi et al., 2022; Yu et al., 2022), which are specifically interested in phenomena that are not easily visible and observable through social media metrics, digital or qualitative methods solely, that is all those everyday practices through which consumers react to algorithms, change their behaviours, purchasing decisions, or identities in response to specific algorithmic outputs, or try to escape the algorithmic systems of recommendation and control.

Despite its many advantages, our methodology has several limitations. The capture of screen recordings generated by participants raises questions about the reliability of observations made in natural settings. Participants were not only aware that their screens were being recorded but they also initiated and shared them themselves. Certain content may have

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been eliminated or obscured, either intentionally or unintentionally. Another limitation is the need for time-consuming, non-automated analysis of the unstructured video data captured via screen recordings. This requirement not only places high demands on the research team but also restricts the number of participants whose behaviour can be analysed. Further ethical considerations may arise where sensitive material is not screened by participants, which could constitute an invasion of privacy. Lastly, again due to time constraints, we had to limit our analysis on social media and related internet searches, overlooking the analysis of other web spaces.

Overall and despite its limitations, DPT can bring methodological innovation in consumer and marketing research, helping researchers in embedding a post-phenomenological sensitivity to data collection, but also technical refinement via the incorporation of digital methods; both elements which are not commonly seen in the field, and which could enrich the quality and scope of insights generated.

Conflict of Interest Statement

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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