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Information Overload and Information Appreciation Across News, Entertainment, and Personal Communication: Scale Development and Application

ANNE SCHULZ*[1]
University of Zurich, Switzerland

SOPHIA CHARLOTTE VOLK*
Ludwig Maximilian University of Munich, Germany

SINA BLASSNIG
University of Fribourg, Switzerland
University of Applied Sciences of the Grisons, Switzerland

SABRINA HEIKE KESSLER
University of Zurich, Switzerland

SARAH MARSCHLICH
MINH HAO NGUYEN
University of Amsterdam, The Netherlands

LEA STAHEL
NADINE STRAUß
University of Zurich, Switzerland

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[1] Schulz: a.schulz@ikmz.uzh.ch
*These authors contributed equally to this work.
Work was initiated when all authors were working at the University of Zurich.
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The advent of digital information communication technologies (ICTs) has created an unprecedented abundance of information across news, entertainment, personal communication, and other media contexts. While prior research has emphasized negative outcomes such as information overload, positive responses to abundance remain underexplored. To address this gap, we developed and validated the Information Overload and Information Appreciation Scale (IOIAS) using a mixed-methods design that combined focus groups and two surveys in German-speaking Switzerland (N = 2,049). The IOIAS captures both negative experiences of overload and positive experiences of appreciation, providing a tool to compare these responses consistently across different media contexts. Applying the instrument, we found that appreciation for abundance was about twice as common as overload in news, entertainment, and personal communication. Contextual differences were modest: overload was slightly more frequent in news, while appreciation peaked in personal communication. More pronounced differences emerged across age, with younger people reporting higher levels of both overload and appreciation, whereas gender, education, and income differences were minimal. Overall, the findings suggest that while overload is a real concern for some, appreciation constitutes a more widespread response to information abundance. Thereby, overload and appreciation are not opposites but can co-occur, underscoring the ambivalent ways in which people experience today's information-rich environments.

Keywords: information abundance, information overload, information appreciation, scale development, survey research, mixed methods, focus group discussions

The rapid advancement of digital media and new information communication technologies has significantly expanded the volume of available information (Neuman et

al., 2012)—a trend that has only accelerated with the rise of user- and AI-driven content generation and dissemination (Floridi & Chiriatti, 2020). This abundance of information spans various media contexts of everyday and work life, such as news, entertainment, personal communication, advertising, and organizational communication.

While an increased information supply can be seen as beneficial, concerns about individuals 'drowning' in a digital information flood dominate public and scientific discourse (Neuman, 2016). Much of the existing research highlights negative consequences of information abundance, particularly through the lens of "information overload" (Bawden & Robinson, 2020) or "news overload" (Goyanes et al., 2021). In personal communication, scholars have identified experiences of "connection overload" (Hall et al., 2021) or "social networking sites overload" (Maier et al., 2015). In the entertainment domain, although the term "entertainment overload" has not been widely used, related phenomena such as binge-watching or problematic gaming have been investigated (e.g., Vaterlaus et al., 2019).

By contrast, only a small body of research has examined individuals' positive responses to information abundance. Hargittai et al. (2012) showed that U.S. citizens value the wealth of information for staying informed and relaxing. Boczkowski (2021) observed similar appreciation, particularly in entertainment, where abundance supports interest-driven content selection. Karaoglu et al. (2021) found that older adults also benefit when abundant information facilitates searching and learning. Yet, such positive perspectives remain underdeveloped, despite evidence suggesting that reactions vary across contexts. Negative reactions like stress or confusion may be more common in the news context, for instance, whereas entertainment and personal communication may elicit more appreciation.

We argue that these positive and negative reactions should not be viewed as opposites but as *coexisting dimensions* of how people experience information abundance. Individuals may value the opportunities of abundant information while, at the same time, feeling overwhelmed by its volume. However, there is currently no measure that captures

this duality in an integrated way. What is more, existing scales measuring information overload are typically rooted in cognitive traditions that emphasize decision-making in work contexts, which are not always transferable or relevant to contemporary media environments (cf. Hargittai et al., 2012). What is missing is a conceptually and empirically grounded measure that captures both appreciation and overload, allows systematic comparisons across media contexts, and reflects how people experience both the benefits and burdens of information abundance. Such a measure has both theoretical and practical utility: it can expand media effects research by linking overload and appreciation, for example, to coping strategies and well-being, while also providing insights into who benefits or suffers in high-information environments.

To address this gap, we develop and validate the **Information Overload and Information Appreciation Scale (IOIAS)** using a mixed-methods design. The IOIAS is intended to supplement or expand existing measures of information overload by focusing on a perceptual dimension that helps explain when and why abundant media environments are experienced as enriching, frustrating, or both. More concretely, the IOIAS captures individuals' perceptions of information abundance by (i) assessing both positive (appreciation) and negative (overload) experiences, and (ii) enabling comparisons across media contexts such as news, entertainment, and personal communication.[2] In developing this new instrument, we seek to disentangle perceptions of abundance from the burdens of processing and decision-making, which earlier information overload measures have often conflated.

This article proceeds as follows: We begin by defining "information abundance" as a macro-level concept and reviewing its relevance in the context of news, entertainment, and personal communication. We then link it to research on "information overload" and introduce the concept of "information appreciation," both discussed as possible coexisting

[2] When we refer to personal communication, we are specifically referring to mediated, digital communication rather than face-to-face communication.

individual-level outcomes of information abundance. Next, we present the scale development and validation process through three empirical studies in German-speaking Switzerland: qualitative focus groups, a pilot survey, and a large representative population survey. Finally, we examine the prevalence of positive and negative experiences, compare them across the three media contexts, and analyze how socio-structural and media use factors shape these perceptions.

Conceptualization of Information Abundance, Information Overload, and Information Appreciation

Information Abundance

Based on previous literature and our own research (Volk et al., 2024), we distinguish between the concepts of information abundance, information overload, and information appreciation. To establish conceptual clarity, we first provide a broad perspective on "information" as a foundational construct that underpins the other three concepts.

Drawing on Case and Givens (2016) and Savolainen (2022), we approach **information** as a primitive concept, "so basic to human understanding that it does not require a tight definition" (Case & Given, 2016, p. 76). This broad approach enables us to consider a wide range of information types that may be relevant to different media contexts without limiting the scope to specific dimensions such as utility, truth, or the structure of information. By adopting this broad definition of information, we ensure that our conceptualizations of information abundance, information overload, and information appreciation remain adaptable to different media contexts such as news, entertainment, or personal communication.

Building on this understanding of information, we define **information abundance** as a macro-level phenomenon that shapes our information environments as an external

condition. It is characterized by a vast, readily accessible supply of information available through various sources (e.g., apps, channels) and devices (e.g., smartphones, radios). This contrasts with information scarcity, where information is limited or difficult to access. Applying the above-mentioned broad definition of information allows us to understand information abundance as an umbrella term applicable to different media contexts (cf. Volk et al., 2024), including context-specific manifestations such as "news abundance," "entertainment abundance," or "personal communication abundance."

As an external condition, information abundance exists independently of individual assessment and can, in principle, be measured through content analytical methods. A notable example is Neuman et al.'s (2012) study, which quantified information supply by tracking the average volume of news entering a U.S. household per day over 45 years. The study recorded an enormous growth of media supply since the 1960s, far exceeding human processing capacities on a typical day.

At the individual level, people may or may not recognize this external condition. This recognition could be called **perceived information abundance**: a neutral acknowledgement of how much information is available, without attaching an assessment. For example, an individual might simply note that "there is a lot of information out there" or, conversely, perceive scarcity of information.

Recognition of abundance can then become the basis for further evaluation. When information abundance is recognized, it can be seen as either overwhelming or burdensome, referred to as **information overload** (Bawden & Robinson, 2020), or as enriching and helpful, which we describe as **information appreciation**.

Information Overload

A considerable body of research has addressed individuals' experience of information overload, which we understand as a potential micro-level consequence of

information abundance. **Information overload** is defined as a state in which the amount of available information exceeds human information processing capacities (Eppler & Mengis, 2004). Classic theoretical and experimental work has framed overload from an *objective perspective*, emphasizing the point at which information supply surpasses cognitive limits, often in high-pressure settings where timely decisions are required. A *subjective perspective* highlights the internal experience of overload. In this view, overload is associated with a range of negative reactions, including confusion (e.g., Chen & Masullo Chen, 2020), exhaustion (e.g., Cao & Sun, 2018; Gao et al., 2018), stress (e.g., Hall et al., 2021; Lee et al., 2016), and depressive symptoms (e.g., Matthes et al., 2021).

The concept of overload has a long history (Bawden & Robinson, 2020), with much of early research focusing on work contexts and decision-making situations that may not be fully relevant to all types of everyday media use. With the emergence of digital media and especially amidst the coronavirus pandemic, research on overload has recently proliferated (e.g., Apuke & Omar, 2023; Hong & Kim, 2020). Research on the subjective experience of overload differs with regard to the breadth and context in which it is studied: A first line of studies approaches "information overload" broadly, that is, without tying it to specific types of information or contexts, media, or devices through which information is received. The second line of research adopts a narrower focus, linking overload to specific digital devices, such as mobile phones (Matthes et al., 2021), social media platforms (Gao et al., 2018; Heiss et al., 2023; Lee et al., 2016), or specific apps like WeChat (Dai et al., 2020). A third research stream examines overload within distinct media contexts; for example, "news overload" in the context of news (Chen & Masullo Chen, 2020; Goyanes et al., 2021; Song et al., 2017). In the context of personal communication, research has explored overload using terms like "connection overload" (Hall et al., 2021), "social overload" (Maier et al., 2015), or "communication overload" (Lee et al., 2016). These studies link overload to interactions on social media, often associated with availability stress and related experiences and disconnection strategies. In the context of entertainment, negative experiences have hardly been studied under the concept of

overload, but, for instance, as increased anxiety associated with binge watching (e.g., Vaterlaus et al., 2019).

Empirical studies across multiple countries indicate that subjective overload perceptions have grown over recent years. In the context of news, 39% of respondents in 47 countries reported feeling 'worn out' by the amount of news in 2024, up from 28% in 2019 (Newman et al., 2024). Earlier data show a similar trend in the U.S., where 38% of respondents reported feeling overloaded by the amount of news in 2008, with increases recorded since 1998 (York, 2013).

Notably, research has shown that certain **socio-structural groups** are more likely to be affected by overload than others (e.g., Holton & Chyi, 2012; York, 2013) and may thus benefit less from abundant information environments. For instance, several studies have shown that being female is positively related to news overload (e.g., Holton & Chyi, 2012; York, 2013; Newman et al., 2024). However, other studies found no effect for gender (e.g., Schmitt et al., 2018), and little is known about how these differences manifest in contexts beyond news. For age, studies have produced mixed evidence, with some showing that younger people experience more overload (e.g., Schmitt et al., 2018; Song et al., 2017), and others indicating that older people feel more overloaded (e.g., York, 2013). Similarly, studies examining socioeconomic variables like education or income have produced conflicting results showing that individuals with higher formal education and income tend to perceive more news overload (Song et al., 2017), whereas other studies find no significant relationship between overload and education (e.g., Schmitt et al., 2018). These findings underscore the need for further research to clarify how sociodemographic and socioeconomic variables relate to overload, especially since such digital inequalities may reinforce existing social inequalities (e.g., DiMaggio et al., 2001; Festic, 2022; Robinson et al., 2015).

Perceptions of overload may also be influenced by factors beyond socio-structural characteristics, including coping strategies (e.g., Heiss et al., 2023; Song et al., 2017),

personal information relevance (e.g., Lee et al., 2016), media use patterns (e.g., Matthes et al., 2021), or motivation for media use (e.g., Schmitt et al., 2018). Prior research has focused on many of these, yet our focus here is on the importance of information (Lee et al., 2016) and media use (Matthes et al., 2021).

Information importance is a key factor as it is related to perceptions of the information itself. Several studies have hypothesized that people for whom information holds little relevance may be more prone to feeling overloaded by abundant amounts of it. However, the evidence remains inconsistent. While some studies have failed to find a significant relationship between information relevance and overload (Lee et al., 2016) or between a civic duty to stay informed and news overload (Schmitt et al., 2018), others have reported that issue importance is associated with higher levels of overload (Metag & Gurr, 2023). Against this backdrop, further research is needed to examine the role of the importance of news, entertainment, or personal communication for information overload and identify whether differences exist across media contexts.

Media use is often discussed as a major source of information overload, but studies on the relationship between media use and overload show inconclusive results (Bawden & Robinson, 2020). Some have found no link between overload and self-reported exposure to different online news sources such as podcasts, videos, or social media (Schmitt et al., 2018). Others reported significant links between overload and frequent use of messenger apps like WhatsApp and social media like YouTube, while not finding this relationship for other media types (Matthes et al., 2021). Hence, the relationship between media use (especially social media and messenger apps) and information overload remains unclear, and it is uncertain whether differences exist between different media contexts.

Information Appreciation

As stated earlier, survey research indicates that 39% of people report feeling overloaded by the news (Newman et al., 2024). While this figure is significant and has been

growing over time, it also implies that a majority of the population does not share this experience. These people might perhaps not perceive information abundance at all, or experience it more neutrally or even positively.

While research on information overload is extensive, few studies have explored potential positive responses to abundant information. For example, a focus group study by Hargittai et al. (2012) found that U.S. citizens often felt enthusiastic and empowered by news abundance, with most participants not experiencing overwhelm. One study participant expressed feeling "overwhelmed and amazed that there's that much out there", indicating that people might simultaneously experience overload and appreciation. A more recent study by Boczkowski (2021), based on qualitative interviews in Argentina, found initial enthusiasm for the news flow, though this enthusiasm declined over time. Boczkowski's finding that "while the uptake of news has devalued this type of content, the opposite has happened to the reception of serialized fiction" (p. xiv) suggests that people experience entertainment abundance more positively than news abundance. This may be explained by the fact that news content is often characterized by negative or serious subject matters, whereas abundance may be more positively connotated in contexts such as entertainment and personal communication (e.g., Karaoglu et al., 2021). In entertainment research, extensive studies on what can be called appreciation have typically focused on the quality of entertainment (Oliver & Bartsch, 2011) rather than quantity. In personal communication, information abundance may enhance social connectivity and well-being (e.g., Franks et al., 2018), despite also potentially causing overload or stress (e.g., Taylor & Bazarova, 2021).

Building on literature pointing to positive experiences with information abundance, we propose information appreciation as a new and complementary concept to information overload that shall help to better understand how individuals experience and derive value from information abundance in different contexts. It shifts our focus toward the potential benefits of information abundance, inviting new perspectives on how people relate to and make use of abundant information in their daily lives. **Information appreciation** is defined

as an inner state where an individual values the availability of abundant information. Subjectively, this may manifest via an array of positive experiences, where information abundance is perceived as helpful, stimulating, or exciting (Boczkowski, 2021; Hargittai et al., 2012).

Information appreciation resembles related concepts such as "appreciation of entertainment" (Oliver & Bartsch, 2011), "news appreciation" (Kleemans et al., 2018), "news enjoyment" (York, 2013), or "media enjoyment" (Nabi & Krcmar, 2014), but unlike these concepts, it is specifically concerned with the quantity of information rather than the quality of information or content. Information appreciation also has parallels to concepts like "algorithm appreciation" from neighboring fields of information systems and algorithm research (e.g., Schecter et al., 2023), but differs in that appreciation is based on positive experiences with information abundance rather than trust in algorithms as a source to select information.

Relationship between Information Overload and Information Appreciation

Although information overload and information appreciation might initially seem like conceptual opposites, representing negative versus positive ends of a single continuum, we argue instead that they are asymmetric dimensions of how individuals experience information abundance. Overload captures the strain, confusion, or cognitive burden associated with too much information, while appreciation highlights the value, enjoyment, and stimulation that the very same abundance can provide. However, these two experiences are not mutually exclusive: individuals may simultaneously feel overwhelmed by information and still recognize or cherish its richness. They may also unfold dynamically over time. For instance, moments of appreciation may alternate with episodes of overload within the same day. Moreover, for some, appreciating abundance forms a foundational outlook, disrupted by situational episodes of overload; for others, overload is the default, occasionally punctuated by moments of appreciation.

This duality can manifest in real-life situations where individuals recognize the benefits and pleasures of access to abundant information, even as they encounter moments of overload or fatigue—sometimes within the same task or period of media use. For example, while researching a topic online, a person might appreciate the availability of multiple perspectives and resources, yet simultaneously feel overwhelmed by the volume to sift through. For some, this co-occurrence is experienced as ambivalence; for others, it is a dynamic interplay shaped by context, task demands, or mood aligning with dual-processing or appraisal theories (e.g., Moors, 2013).

That said, recognizing overload and appreciation both as complementary yet distinct constructs enables a more nuanced understanding of how individuals experience abundant information environments. Positive and negative experiences may be associated with well-being, political participation, or knowledge, and can reveal inequalities in who benefits from information-rich environments and who faces its burdens (Bawden & Robinson, 2020; Robinson et al., 2015).

Measurements of Information Overload and Information Appreciation

Measuring Information Overload

Despite extensive research on information overload, no single measurement approach has emerged, resulting in considerable conceptual and operational diversity. This diversity stems in large part from the historical evolution of the concept outlined above, which led to a distinction between objective and subjective approaches to overload (Eppler & Mengis, 2004). *Objective overload* is primarily cognitive and arises when the amount of information exceeds an individual's capacity to make sound decisions within a fixed timeframe—a view developed in high-pressure domains such as the military or medicine, with an emphasis on cognitive processing and performance under time constraints (Schick et al., 1990). This approach is typically tested in experimental research.

In contrast, *subjective overload* foregrounds the individual's internal experience: feelings of stress, confusion, anxiety, or depletion indicate overload in abundant information environments (Eppler & Mengis, 2004), that is, in everyday life and not necessarily in decision-making situations. While it is more affective in nature, subjective overload may also encompass perceived cognitive strain or confusion. Although the conceptual shift toward subjective and affective responses is widely acknowledged, many survey measures still reflect the legacy of the objective tradition, often referencing decision-making, time pressure, or processing demands—even in studies of everyday media use. However, as Hargittai, Neuman, and Curry (2012) note, most media exposure occurs in relaxed, non-time-pressured environments, raising questions about the transferability of classic, decision-focused overload measures to contemporary media contexts.

Examples of this conceptual mixing are evident in commonly used scales. The widely adopted Karr-Wisniewski and Lu (2010) measure, originally from a business context, comprises three items on a nine-point agreement scale, covering (a) overwhelm, (b) distraction, and (c) decision-making challenges. For instance, one item states, "I am often distracted by the excessive amount of information available to me for business decision making," which communication studies have directly adapted to media contexts: "I am often distracted by the large amount of information I receive on social media" (Heiss et al., 2023; emphasis added) with similar adaptations in other studies (see Cao & Sun, 2018; Gao et al., 2018; Lee et al., 2016; Matthes et al., 2021; Zhang et al., 2016).

Similarly, Williamson and Eaker's (2012) 15-item scale includes items such as, "I feel overwhelmed learning a new subject or topic because there is so much information." Communication studies often adopt only selected items from this scale, typically those focused on (a) overwhelm or (b) processing abilities (e.g., Metag & Gurr, 2023; Schmitt et al., 2018; van Erkel & van Aelst, 2020), thereby combining both emotional responses and cognitive capacity in their assessment of information overload. Again, other studies build on Song et al. (2017), who use a three-item measure addressing (a) overload, (b) processing

ability, and (c) time restrictions. An item frequently adopted in communication and media research is "I receive more news than I can process" (e.g., Metag & Gurr, 2023; Park, 2019). Finally, some measures expand to capture additional dimensions of overload. For instance, Chen and Masullo Chen (2020) added (a) stress, (b) worry, or (c) confusion, as in: "I feel confused with the amount of news available these days."

In summary, most existing information overload scales blend two distinct conceptual strands: (i) negative perceptions of the abundant information environment and (ii) the cognitive or emotional burden of processing or responding to that information. Disentangling these dimensions could help explain why studies using different measures have produced mixed evidence regarding the prevalence of overload and the specific societal groups that are more sensitive to information abundance.

Second, the literature diverges on whether information overload is measured broadly or specifically. Broad measures do not link overload to specific sources, devices, or contexts; a typical item might read, "I find that I am overwhelmed by the amount of information I have to process on a daily basis" (Karr-Wisniewski & Lu, 2010; emphasis added). Other studies use source- or device-specific measures, adding specificity to the items, such as "I find that I am overwhelmed by the amount of information I have to process on a daily basis in the smartphone-based SNS" (Gao et al., 2018; emphasis added). Some studies target context-specific overload, for instance, in the news context: "I feel overwhelmed with the amount of news available these days" (Chen & Masullo Chen, 2020; emphasis added) or "I feel overloaded by the amount of COVID-19 information I am supposed to know" (Hong & Kim, 2020; emphasis added).

Third, existing overload measures also differ in item quantity, wording, and scale use. Most studies assess overload with 3-4 items, while only a few rely on single-item measures, such as "Would you say you often feel overloaded with the amount of news available these days, or not." (Holton & Chyi, 2012) or "Have you ever felt overwhelmed in terms of the information provided by various media?" (Ji et al., 2014). Overload is

seldomly measured with more than four items (see Hong & Kim, 2020; Williamson & Eaker, 2012).

Lastly, overload scales predominantly rely on agreement scales, typically ranging from "strongly disagree" to "strongly agree" on five-, seven-, or nine-point Likert scales. In contrast, only few studies employ frequency scales, capturing overload on scales ranging from "not at all" to "a lot" or "frequently" (Holton & Chyi, 2012; Ji et al., 2014), or from "never" to "always" (Hall et al., 2021). Notably, most items implicitly suggest frequency by incorporating terms like "often" or "every day" within the item descriptions.

Measuring Information Appreciation

The literature review indicates that current measures of people's experiences with information abundance are skewed toward capturing negative experiences, particularly in terms of subjective information overload, whereas more neutral or positive experiences, like appreciation of abundance, are omitted. In the news context, "news appreciation" has been measured for specific news stories (Kleemans et al., 2018), asking respondents to rate stories using a single item scaled from (1) "very low appreciation" to (10) "very high appreciation". A survey by the Pew Research Center has used a single item to measure "news enjoyment" (York, 2013) more broadly on a four-point agreement scale. In the entertainment context, appreciation has often been measured in relation to specific content, such as a movie, using three items on a seven-point agreement scale (e.g., "I found this movie to be very meaningful") (Oliver & Bartsch, 2011). Importantly, these measures focus on the quality of content rather than the abundance of information in today's digital information environments. To our knowledge, no existing measure captures information appreciation as a subjective, positive experience specifically tied to the available volume of information.

This gap represents a methodological limitation that results in restricting our understanding of how people perceive and experience information abundance in

contemporary information environments. While existing scales allow respondents to "disagree" or respond "not at all" on an overload scale, they do not enable respondents to directly express positive experiences with information abundance. Without such a measure, current research findings, while valuable, may cumulatively present a skewed view that inevitably overlooks positive and ambivalent responses likely shaping everyday experiences with digital media—and more specifically, the abundance of information available (e.g., Taylor & Bazarova, 2021).

Toward Measuring Information Overload and Information Appreciation in News, Entertainment, and Personal Communication

This study aims to develop a measure that captures both negative and positive experiences of information abundance and is applicable across different media contexts. To address this critical gap in the literature, we explicitly focus our overload measure on individuals' negative feelings arising simply from being surrounded by abundant information, rather than on processing demands or decision-making pressures that dominate many prior scales. In developing this measure, we build on the extensive literature reviewed above, but also openly explore people's lived experiences to understand how information overload and appreciation manifest in their own words. We pursue three research questions:

First, we take an exploratory, qualitative approach to uncover whether people experience information abundance positively or negatively, if at all. We compare our findings across the contexts of news, entertainment, and personal communication. This explorative research will provide a foundation for developing standardized survey items, derived directly from participants' own expressions, to measure both information appreciation and information overload.

RQ1: How do people experience information abundance in the contexts of news, entertainment, and personal communication, and how can this be measured?

Second, we aim to statistically describe individuals' positive and negative experiences with information abundance using cross-sectional survey research:

RQ2: What is the prevalence of positive experiences (information appreciation) and negative experiences (information overload) with information abundance among the adult Swiss population, and how do these experiences differ across the contexts of news, entertainment, and personal communication?

Third, considering that previous research has produced mixed evidence on the relationship between overload and factors such as age and education (Song et al., 2017), leaving possible digital inequalities unexplained, we aim to provide new evidence regarding the associations between information appreciation and information overload and sociodemographic and socioeconomic factors. Moreover, we aim to examine the relationship between information appreciation and information overload, and the importance of news, entertainment, and personal communication, and media use.

RQ3: How are information appreciation and information overload related to socio-structural factors, importance of news, entertainment, and personal communication, and media use?

Methods, Data, and Results

To address these research questions, we employed a mixed-methods approach and conducted three studies. For RQ1, we followed Carpenter (2018) and combined qualitative and quantitative research to understand people's positive and negative experiences with information abundance and, based on that, developed and validated a new measurement. Specifically, we conducted focus group discussions (Study 1) to lay the groundwork for designing self-reported measurements, which were then tested in a small survey (Study 2) and validated in a large survey representative of the adult online population in German-

speaking Switzerland (Study 3). For addressing RQ2 and RQ3, the dataset from Study 3 was analyzed.

Study 1: Focus Groups

Participants (S1)

We conducted a series of eight online focus groups with $N = 40$ participants (49% women, 45% younger than 40 years), combining a convenience sampling and a theoretical sampling approach (Robinson, 2014). Using a screening survey, we recruited participants of different backgrounds ($N = 108$) (see sampling strategy and sample description in SM1 and SM2). Participants were told that the interviews were about their media use for all purposes, and we did not introduce "information abundance" as the topic of our research. The semi-structured interview guide (see SM3) elicited responses on participants' experiences of having an abundance of news, entertainment, and personal communication available. Two authors engaged in a structured approach to qualitative content analysis (Rädiker & Kuckartz, 2019), coded the de-identified transcripts, compared themes and discussed them with the larger team, and then further refined and organized subthemes (for the codebook and analytical strategy, see SM4). In the following, we provide pseudonymized quotes from participants and their ages for illustrative purposes.

Results (S1)

Participants in our study perceived the increase in volume of information as one of the most notable changes in the media environment in the past. They also reported both negative as well as positive experiences with the abundance of information in the contexts of news, entertainment, and personal communication.

Perception of abundance. We first asked our focus group participants to reflect on whether and how the media surrounding them had changed over the past 10-20 years. In

three of our four focus groups, the very first association was a reference to the increase in information supply. A typical comment, for instance, by an older participant was that "[w]hat was a stream has become a raging river. The quantity is insane" (Kuno, 55). Younger participants especially mentioned the rising abundance on social media, as illustrated by the quote: "Ten years ago, you could already find a relatively large amount on the Internet, but […] now there are many new information channels or profiles on Instagram or YouTube" (Tanja, 25). They also drew comparisons between traditional and digital media: "When you get information online, you can basically scroll, scroll, scroll and never stop. When you turn the pages, at some point the newspaper ends" (Claire, 29). A common perception was that "you get too much news coverage" (Regina, 59), but a few interviewees also perceived a scarcity of information in certain contexts, for instance, that there are fewer print newspapers or cultural entertainment offerings now than in the past. Some participants also felt that the abundance of information was just right, saying: "I don't feel like it's too much or too little. I feel like it's just the way I chose it to be." (Alice, 22).

Negative experiences. The volume of information was initially experienced quite negatively across our groups. Negative experiences with information abundance were often associated with mobile devices, particularly smartphones, as well as with social media, streaming platforms, and messaging services like WhatsApp. Without prompting for it, several participants used terms like "overload" (Tobias, 40) and "overwhelm" (Ulrich, 73) to describe their feelings. Such overload experiences were frequently tied to news in general, specific news topics, and "extreme times" (e.g., the coronavirus pandemic or the war in Ukraine). However, negative experiences with abundance also extended to entertainment and personal communication contexts; for example, participants reported feeling "overwhelmed" (Till, 20) by the extensive entertainment options on platforms like Netflix. In addition to "overload" and "overwhelm," participants used various negatively connoted verbs to describe their reactions to abundant information, mentioning that it "stresses," "distracts," "annoys," "confuses," or "exhausts" them.

In the news context, one participant noted that due to the constant news flow "you're always under pressure" (Regina, 59), and several mentioned the coronavirus pandemic as a situation in which the amount of information "exhausted" them: "When I think of the coronavirus pandemic, when the new figures came out every day or almost every day, how many people were infected and died again, etc., that can be exhausting" (Claire, 29). Another participant described the start of the war in Ukraine as a "distracting" situation where "[…] this flood of information kept me from doing anything else" (Adrian, 29). Another expressed that the volume of news, particularly fake news, was "unsettling," stating, "It's really difficult to find the exact sources that you can count on" (Kai, 51). In the entertainment context, some participants felt "confused" by the sheer range of options, such as "the hundred-plus television programs" available (Ulrich, 73). Others reported feeling "distracted" by the content on social media; one participant noted, "I wander off, especially on Instagram, and then suddenly look at things that just attract me and draw my attention" (Alice, 22). In personal communication, participants frequently mentioned feeling "annoyed" or "stressed" by the volume of information received through messaging apps and social media. As one participant shared, "[…] from friends or emails from work—an overload of content that I then have to deal with, which annoys me and stresses me out" (Lisa, 34).

Positive experiences. Despite these negative experiences with the volume of information, participants also reported numerous positive experiences both with and without prompting. In fact, positive and negative assessments were nearly balanced; participants recognized both the challenges and the benefits of abundant news, entertainment, and personal communication. Generally, there was consensus that "it's better to have too much than too little" (Victor, 73), as greater supply also provides greater choice. Participants used expressions like "helps," "excites," "inspires," and "satisfies" to describe their positive reactions to the abundance of information.

In the news context, several participants appreciated the variety of perspectives available: "You get to see different views on something, also from different countries, and

for different positions" (Sarah, 22). One participant shared that, during the coronavirus pandemic, she "listened to countless podcasts about how not to go crazy during the lockdown […] and [I] always found it all really exciting" (Tanja, 25). Older participants were especially satisfied with the ease of accessing diverse news channels, as one noted: "I like the variety and the simplicity. Now you don't have to fight so hard to find different radio or TV stations anymore" (Oumar, 56). Others felt inspired and happy with the vast information available online, saying it "introduced me to topics that I wouldn't otherwise have dealt with" or "if I have some obscure question about some niche topic, then I'm happy if someone has written something about it" (Till, 20). In the entertainment context, participants found the variety "helpful" for catering to different tastes: "Tastes are really different. Some don't like crime fiction at all. I'm a big fan of crime fiction. […] The wide range really helps to ensure there's something for everyone" (Kai, 51). For personal communication, participants appreciated the opportunities to "stay in touch, connect […], write something nice or funny" (Martina, 67). Some described it as stimulating, explaining, "you can talk a lot over WhatsApp and other people can provide information and other perspectives, so you get a bit more of a worldview" (Peter, 48).

Ambivalence. Participants' expressions of both positive and negative assessments highlight ambivalent experiences with information abundance. For example, several participants noted that the volume of information "has advantages and disadvantages" (Regina, 59) or described it as a "double-edged sword" (Tanja, 25). When asked to weigh these assessments, several participants mentioned that their experience with abundance "depend" and vary based on strategies for managing information, as well as context and situation: "I think the amount on offer is actually positive at first, but I realize that it really depends on my attitude, whether it gives me something or whether I am rather annoyed or overwhelmed" (Till, 20). Notably, feelings of overwhelm or overload also seemed sensitive to time and "how busy you are" (Valerie, 27), fluctuating between workdays, weekends, or holidays. As one participant explained, "if I have a lot of free time, then it's much more difficult [than] if the day is normally structured, because then [time] it's automatically limited" (Lisa, 34). Moreover, experiences of information abundance appeared to be linked

to personal relevance of that information. For example, several participants mentioned that they found information overwhelming when it was not personally meaningful to them, but appreciated the amount when they found it interesting. Marion (32) shared: "I realize that it's actually too much for me […] because there is too much in the information flood that I don't want to know, I'm not interested in, and that isn't relevant". Similar remarks were made by others about entertainment abundance or personal communication abundance. For instance, one participant described being annoyed by "a group chat and discussions going back and forth between two people that […] I'm not interested in it" (Regina, 59).

Discussion (S1)

Overall, the focus groups provided nuanced insights into how people experience information abundance. While participants noted that certain types of information can be scarce, they generally agreed that a vast amount of information is available across contexts. Many described this abundance (RQ1) as having both positive and negative aspects. These findings inform the development of a standardized measure capturing both sides of information abundance. Participants' descriptions were condensed into 18 items that reflect positive experiences (e.g., "inspires") and negative experiences (e.g., "annoys") (see SM5 for sample quotes illustrating participants' own words).

Several key implications emerged from this qualitative exploration. First, participants perceived an abundance of information across media contexts, ranging from feelings that there is "too much" to "too little" information to feeling that the amount is "just right". Second, experiences with information abundance were multifaceted and cannot be reduced to simple positive-versus-negative dichotomies; participants often felt both appreciative but also recorded experiences of overwhelm, suggesting that appreciation and overload are not mutually exclusive but rather interlinked. Third, negative experiences were not limited to the news context alone but extended across entertainment and personal communication. Survey research is needed to assess whether individuals experience information abundance more negatively in the news context compared to other media

contexts. Fourth, participants' comments indicated that negative experiences with information abundance were shaped by situational factors, such as the pandemic or available time, and specific media like messenger applications. This suggests that perceptions fluctuate over time and in intensity. Fifth, positive and negative experiences appeared to be influenced by information importance, suggesting that participants appreciate the amount of information more in contexts they find interesting.

Study 2: Scale Development

Informed by our focus group discussions and existing measures of overload, we conducted Study 2 to develop a survey measure for capturing experiences of information abundance across various media contexts. The new measure intended to:

1. Capture both positive and negative experiences: We sought a single question applicable across different media contexts, with separate items for positive and negative experiences, allowing respondents to indicate whether they feel overwhelmed, appreciative, or both.
2. Disentangle conceptual strands: Our measurement approach deliberately focuses on negative perceptions of being surrounded by abundant information, while excluding references to decision-making demands or processing obstacles that are central to prior scales.
3. Include a diverse range of experiences: The measure had to cover various experiences such as stress, confusion, overload (information overload), excitement, or help (information appreciation); we decided to use verbs reflecting such experiences.
4. Employ non-suggestive wording: We aimed to avoid leading terms like "excessive amount of information" or "avalanche of", instead neutrally referring to the "amount" of information.
5. Use a frequency scale: Reflecting focus group insights about time dependence, we implemented a frequency rather than agreement response format.

Adhering to these points, we developed the following measure: “The amount of information and offerings available today in the area of [news/entertainment/digital personal communication] … [example item: overloads me]” featuring eleven negative and seven positive reactions to information abundance (Table 1). Consistent with previous measures, we included items representing feelings of overload, stress, pressure, and distraction. Inspired by our focus group study, we added further items to capture a broader spectrum of negative (e.g., “exhausts me”) as well as positive reactions (e.g., “helps me”). The 18 items were randomized, and responses could be given on a five-point Likert scale, reading 1 = *never*, 2 = *seldom*, 3 = *now and then*, 4 = *often*, and 5 = *always,* with an option to express “*don’t know*” (see SM6). We implemented our new question in the middle of the questionnaire, dedicating one survey page to each of the three contexts (news, entertainment, and personal communication). Contexts were carefully defined, and their definitions were displayed at the bottom of each relevant survey page. In addition, emojis were used to help participants recognize which context each page referred to (see SM7 on interview guidance).

Participants (S2)

We conducted a cross-sectional online survey with N = 199 participants from German-speaking Switzerland to test our newly developed questions and items in July 2023. The sample consisted of 48% women, with an average age of 49 years (SD = 15). No demographic quotas were applied.

Results (S2)

Exploratory Factor Analysis (EFA) was conducted using principal axis factoring with varimax rotation to analyze and compare the internal structure of the scale within each of the contexts. Entering the 18 positive and negative items into the analysis resulted in a solid two-factor solution for each context, with a clear negative and a clear positive factor (Table 1).

However, for entertainment, the items “distracts me” and “relieves me” showed cross-loadings greater than .3. Since distraction can be perceived as both positive and negative, particularly in the context of entertainment, we deleted this item from our scale. We also dismissed “relieves me” to maintain the clarity and reliability of our scale. This process left us with ten negative and six positive items for all three contexts.

Table 1. Initial factor solution for news, entertainment, and personal communication, Study 2.

The amount of information and offerings available today in the area of…		**news…**		**entertainment…**		**personal communication…**	
		neg	pos	neg	pos	neg	pos
1.	exhausts me	0.791		0.824		0.747	
2.	stresses me out	0.852		0.859		0.850	
3.	leaves me confused	0.798		0.837		0.771	
4.	unsettles me	0.808		0.849		0.722	
5.	distracts me	0.438		0.376	0.374	0.573	
6.	overloads me	0.878		0.841		0.800	
7.	overwhelms me	0.839		0.815		0.841	
8.	scares me	0.691		0.810		0.692	
9.	puts me under pressure	0.838		0.812		0.792	
10.	annoys me	0.623		0.719		0.645	
11.	bothers me	0.690		0.755		0.732	
12.	stimulates me		0.766		0.738		0.650
13.	excites me		0.766		0.814		0.790
14.	satisfies me		0.695		0.781		0.797
15.	inspires me		0.794		0.756		0.627
16.	helps me		0.748		0.714		0.764
17.	makes me happy		0.798		0.807		0.748
18.	relieves me		0.716	0.321	0.563		0.701
Explained Variance		.39	.20	.39	.22	.36	.21
N		164		174		171	

Note. Loadings are from an exploratory factor analysis (EFA); extraction method: principal axis factoring; rotation method: varimax; loadings <.3 suppressed. Responses were given on a 5-point frequency scale ranging from “Never” to “Always,” with a “Don’t know” option. Participants who selected “Don't know” were excluded from the corresponding analysis, resulting in different sample sizes for each context.

To create a more parsimonious yet diverse set of positive and negative items, we refined the scale step-by-step, excluding items with similar semantic meanings in German while closely monitoring factor loadings consistency across contexts, and theoretical coverage of the concepts. The identified pairs of semantically similar items correlated substantially, indicating redundancy (for details, see SM8 and SM9).

Our final **Information Overload and Information Appreciation Scale (IOIAS)** consists of six items—three each for overload and appreciation—with item loadings all exceeding .60 across news, entertainment, and personal communication contexts. The exact wording of all IOIAS items is presented in Table 2, which also shows factor loadings and reliability statistics. While not all positive item loadings are optimally high, the finalized set captures diverse and meaningful positive experiences. The IOIAS was validated in Study 3.

Study 3: Scale Validation and Description

Study 3 had multiple purposes: (i) to confirm the structural integrity of the final scale, (ii) to validate the new overload scales against previous information overload measures to establish convergent validity, (iii) to examine the empirical relationships among all new measures to assess their distinctiveness and the interrelation between overload and appreciation within and across contexts, (iv) to explore the prevalence of positive and negative experiences with information abundance across news, entertainment, and personal communication contexts, and (v) to assess criterion validity by examining its relationship with relevant factors.

Participants (S3)

We conducted a comprehensive cross-sectional survey in German-speaking Switzerland in August 2023, using an online panel with quotas for age, gender, and

education. A total of N = 2’049 participants responded, of whom 51% were female. The mean age was 45 years (SD = 16, range 18-81), and 35% held a degree in tertiary education, which closely matches the population aged 18-74 years in German-speaking Switzerland.

Table 2. Final IOIAS items and factor loadings for perceptions of information abundance in news, entertainment, and personal communication.

The amount of information and offerings available today in the area of…		**news…**		**entertainment…**		**personal communication…**	
		negative	positive	negative	positive	negative	positive
Study 2							
4.	unsettles me	0.818		0.823		0.698	
6.	overloads me	0.876		0.831		0.784	
9.	puts me under pressure	0.874		0.841		0.849	
13.	excites me		0.791		0.763		0.937
15.	inspires me		0.803		0.791		0.568
16.	helps me		0.627		0.696		0.634
Explained Variance		.44	.22	.39	.25	.36	.23
Cronbach’s Alpha		.90	.79	.88	.80	.82	.74
N		178		181		181	
Study 3							
1.	unsettles me	0.782		0.824		0.763	
2.	overloads me	0.817		0.810		0.808	
3.	puts me under pressure	0.828		0.835		0.824	
4.	excites me		0.836		0.740		0.838
5.	inspires me		0.837		0.826		0.773
6.	helps me		0.741		0.749		0.671
Explained Variance		.38	.28	.40	.24	.34	.28
Cronbach’s Alpha		.85	.85	.87	.82	.84	.80
N		1’968		1’961		1’956	

Note. See Table 1 for EFA methodology details. In Study 2, items were numbered based on the initial larger pool, while Study 3 used a renumbered subset of the best-performing items.

Measurements (S3)

To measure overload and appreciation of information abundance in the contexts of news, entertainment, and personal communication, we used the IOIAS developed through Studies 1 and 2. In Study 3, we validated the scale by linking it to several external variables. First, we assessed its convergent validity by correlating it with a measure of overload used in previous studies. Second, in an effort to establish criterion validity, we examined how the IOIAS relates to socio-structural variables (age, gender, education, and income), importance of news, entertainment, and personal communication, and media use within each of these contexts, with social media and messaging apps analyzed separately (see SM10 for details on measures).

Scale Validation (S3)

Internal Structure and Reliability. We assessed the scales' internal structure and reliability through exploratory factor analysis (EFA) and internal consistency checks. Using Study 3 data, we replicated the EFA results presented in Table 2, confirming a strong factor structure with all item loadings exceeding .67. Additionally, the scales demonstrated strong internal consistency, with Cronbach's Alpha values exceeding .8 across all contexts, indicating that the items within each scale reliably measure the same underlying construct. Moving on, three confirmatory factor analyses (CFAs) assessed the structural validity of the proposed two-factor solution across the different contexts. The measurement model specifies two latent constructs: overload and appreciation, each measured by three observed indicators that load exclusively onto their respective latent variable. The two latent constructs are allowed to covary, reflecting the possibility of a relationship between overload and appreciation. Following Schermelleh-Engel et al. (2003), the first CFA for news demonstrated a good fit, with a Comparative Fit Index (CFI) of .993, Tucker-Lewis Index (TLI) of .986, and a Root Mean Square Error of Approximation (RMSEA) of .050. The second CFA for entertainment also showed a good fit (CFI = .993, TLI = .987, RMSEA = .047). The third CFA for personal communication revealed an adequate model fit,

indicated by a CFI of .983, a TLI of .969, and an RMSEA of .068. Significant covariances (.32 for news, .37 for entertainment, .25 for personal communication) reveal that while individuals may experience both overload and appreciation, the two dimensions remain empirically separable and only moderately associated, supporting our claim of asymmetry and co-occurrence. (SM11).

Convergent Validity. To establish convergent validity, we correlated our new overload scales with a widely used measure of "information overload" in communication science (e.g., Heiss et al., 2023; Lee et al., 2016; Matthes et al., 2021). As expected, the new news overload scale shows a strong correlation with the established measure (r = .56), with slightly lower but still robust correlations for entertainment and personal communication (r = .50 each) (see Figure 1). While these coefficients confirm that our new measures capture the core construct of overload and broadly align with existing operationalizations, the associations are not as high as might be expected if both measures tapped an identical concept. This likely reflects our deliberate exclusion of decision-making from our scale, which is a central feature of traditional overload instruments.

Relationship Among New Measures. Figure 1's heatmap further clarifies relationships among the new measures: Within each context, the three overload scales are strongly correlated (r = .56-.71), as are the appreciation scales (r = .55-.64), suggesting consistent individual tendencies toward overload and appreciation across contexts. However, appreciation and overload also show positive, although much weaker, correlations within the same context (e.g., entertainment = .21). These patterns are conceptually important: if overload and appreciation were strict opposites, we would expect strong negative correlations. Instead, the weak positive associations support our theoretical claim that individuals can value abundance even as they feel overloaded. Thus, these findings empirically confirm the distinctiveness of overload and appreciation, and highlight that information experiences can be marked by ambivalence or co-occurrence.

Cross-Context Patterns. Examining cross-context patterns, the heatmap reveals moderate positive correlations between appreciation and overload measures of different domains (e.g., news appreciation with entertainment overload: r = .25; entertainment appreciation with news overload: r = .19). These links imply that predispositions to appreciate information in one area may be associated with experiencing overload in another, reflecting the interplay of individual information orientations, contextual influences, and complexity in how people respond to information abundance.

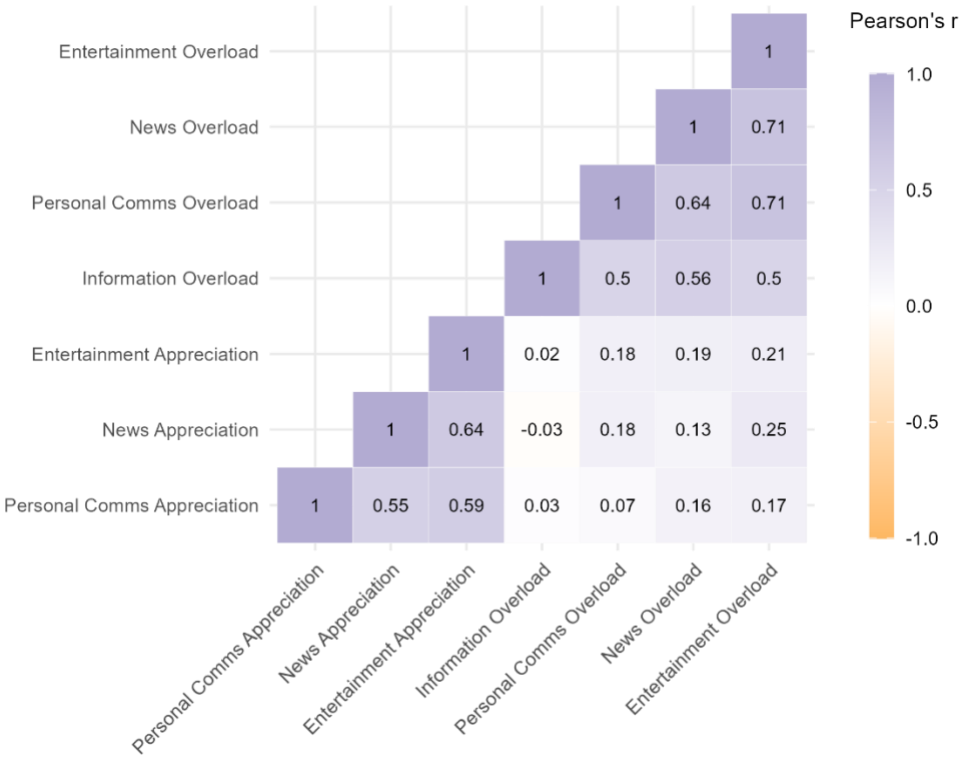

Figure 1. Correlations among overload and appreciation variables.

Note. Pearson correlation coefficients between study 3 measures and "information overload" measure (drawn from Matthes et al., 2021). Colors indicate positive (purple) and negative (orange) correlations. Analysis excludes "Don't know" responses via listwise deletion.

Scale Description (S3)

To address the prevalence of positive and negative experiences (RQ2), we inspected the recoded distributions of the mean indices (Figure 2a) and the underlying continuous distributions via density plots (Figure 2b). As shown in the bar chart, a majority of participants reported experiencing overload *rarely* across all contexts, most notably in entertainment (66%), and also in news (55%). At the other extreme, *frequent* overload is relatively uncommon, with the highest prevalence in the news context (15%) and the lowest in the entertainment context (11%).

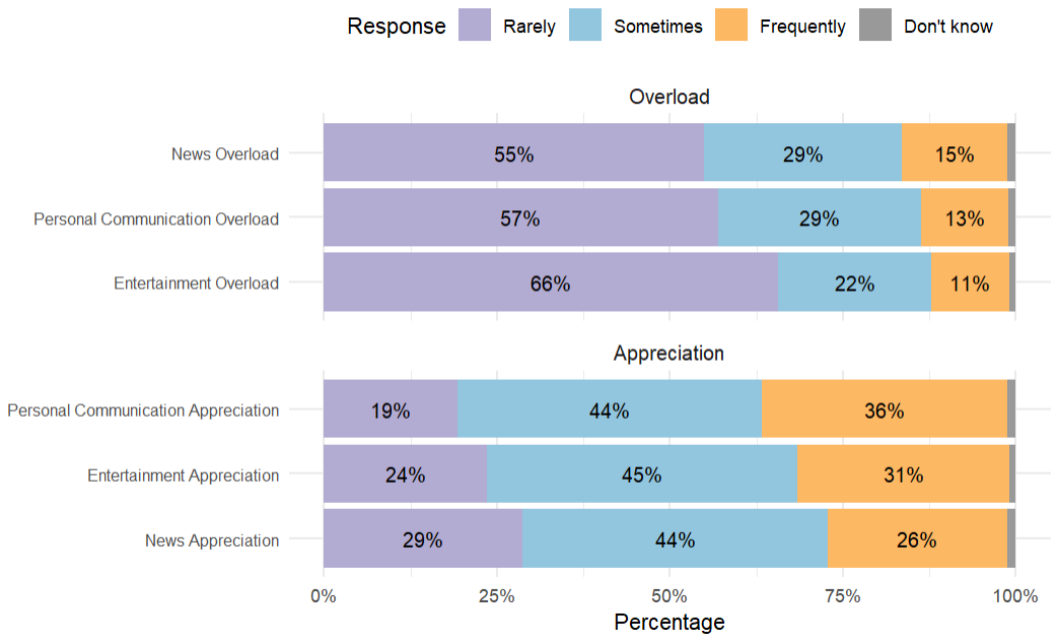

Figure 2a. Prevalence of information overload and appreciation across contexts.
Note. Responses to mean indices were recoded into four categories for interpretability: "Rarely" (mean scores 1 to <2.5), "Sometimes" (mean scores 2.5 to <3.5), "Frequently" (mean scores 3.5 to 5), and "Don't know" for cases where participants selected "Don't know" on any of the constituent items. "Don't know" responses were excluded when computing mean indices to ensure accurate calculations.

Our data on appreciation of information abundance indicates that *frequent* appreciation is twice as common as *frequent* overload – a finding present in all contexts. Appreciation of information abundance is especially prevalent in the context of personal communication, with 36% of participants reporting experiencing it *frequently*. In the entertainment and news contexts, *frequent* appreciation is less common but still notable, with 31% and 26%, respectively.

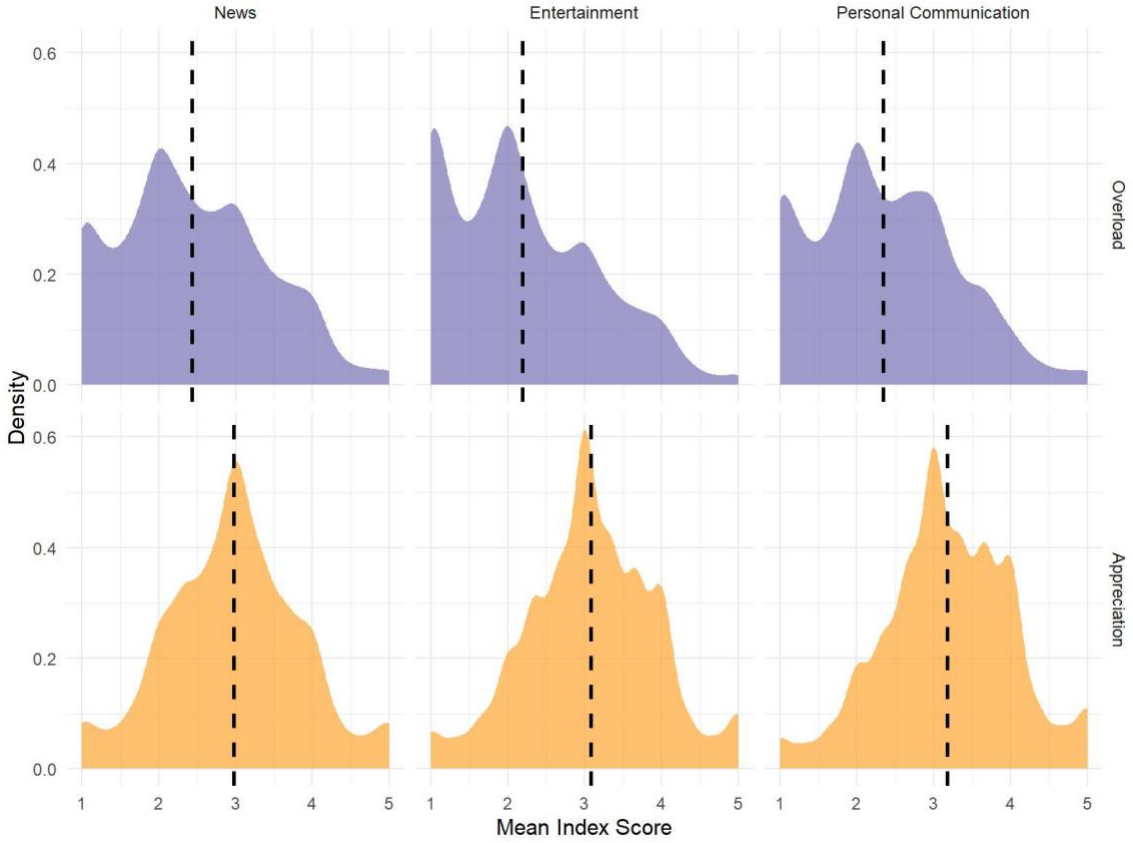

Figure 2b. Distribution of information overload and information appreciation indices across different contexts.

Note. Density plots show the distribution of mean index scores for information overload (top row) and appreciation (bottom row) in the contexts of news, entertainment, and personal communication. Vertical dashed lines mark the mean for each distribution. The range of scores reflects the frequency of participants' experiences, with higher scores indicating more frequent overload or appreciation.

The density plots in Figure 2b provide a fuller picture of the data, revealing not just categorical prevalence but also the continuous distribution and variability of information experiences within each context. Experiences of information overload are clearly concentrated at the lower end of the scale, as shown by the pronounced left-skew across all domains. Most participants report low overload, and few reach higher levels. By contrast, appreciation is more evenly distributed and shifted toward higher scores, with the means (dashed lines) in each context consistently above those for overload. Comparing the distributions and central tendencies, appreciation emerges as the more prevalent response to information abundance across all domains.

Additional descriptive statistics show that across the three contexts, only 3-4% of respondents report *frequently* experiencing both overload and appreciation, highlighting the relative rarity of this experience (see SM12 for descriptive statistics, including means and standard deviations for all individual items and their respective indices).

Building on the descriptive results, repeated measures ANOVAs were conducted to assess whether experiences of overload and appreciation differ significantly across the contexts of news, entertainment, and personal communication. For overload, a significant main difference by context was found ($F(2, 4030) = 106.06$, $p < .001$, ges[3] = .011), indicating differences in overload experiences between the contexts. Pairwise comparisons revealed that overload was significantly higher in news compared to entertainment ($\Delta = .24$, $p < .001$) and personal communication ($\Delta = .08$, $p = .014$). Additionally, personal communication elicited significantly higher overload than entertainment ($\Delta = .16$, $p < .001$). Although these differences reached statistical significance, the magnitude of the relationship between media context and overload (*ges* = .011) was small, suggesting that the practical importance of context-specific differences in overload is limited.

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[3] Generalized eta-squared (ges) measures the proportion of total variance in the dependent variable explained by the independent variable. Unlike partial eta-squared, ges accounts for both between- and within-subject variability, making it suitable for repeated measures designs. Values of .01, .06, and .14 are typically interpreted as small, medium, and large differences, respectively (Bakeman, 2005).

For appreciation, the repeated measures ANOVA also revealed a significant main difference across media contexts ($F(2, 4026) = 68.36$, $p < .001$, $ges = .009$). Pairwise comparisons indicated that appreciation was significantly higher in entertainment than news ($\Delta = .11$, $p = <.001$) and significantly higher in personal communication than news ($\Delta = .20$, $p < .001$). Moreover, appreciation in personal communication was significantly higher than in entertainment ($\Delta = .09$, $p = .0017$). As with overload, the association between media context and appreciation ($ges = .009$) was small.

Together, these findings reveal distinct context-specific patterns for overload and appreciation. While news triggers the highest levels of overload, it also produces the lowest levels of appreciation. In contrast, personal communication generates the highest levels of appreciation, suggesting that participants perceive information abundance in this context as more positive than abundance in other contexts.

Analysis (S3)

To explore how the scales vary across socio-structural groups and information-related factors (RQ3), we conducted regression analyses to examine appreciation and overload across the three contexts and assess criterion validity (see SM12 for regression table). **Age** is significantly negatively associated with five of the six outcomes, with younger individuals reporting higher overload and higher appreciation levels in news and entertainment contexts (Figure 3). The decline with age is steeper for overload than appreciation, indicating that older individuals experience less overload. Age differences in appreciation levels are smaller and non-significant in the personal communication context. Overall, younger individuals show greater overload and appreciation, suggesting ambivalent perceptions of information abundance. **Gender** differences emerge in the news and entertainment contexts. Specifically, men report higher appreciation for the abundance of news ($\beta = 0.09$, $p < .05$) and entertainment ($\beta = 0.15$, $p < .001$) compared to women. No significant gender differences emerge for news overload.

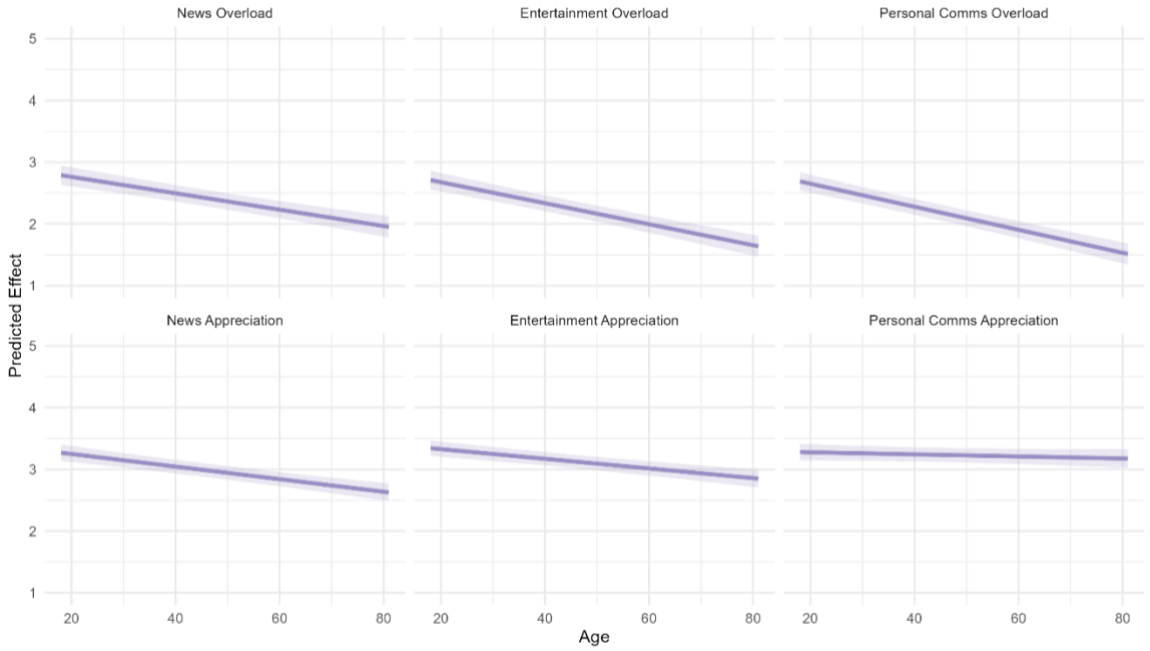

Figure 3. Estimated marginal means of age across dependent variables

Note. Estimated marginal means are based on regression models shown in Table 3. The y-axis reflects predicted mean values ranging from 1 (lowest level of overload or appreciation) to 5 (highest level of overload or appreciation).

Education is only significantly associated with overload in the personal communication context, where individuals with secondary ($\beta = 0.18$, $p < .05$) and tertiary education ($\beta = 0.24$, $p < .01$) report higher overload compared to those with obligatory education. No significant associations are observed for appreciation across any context. **Income** appears to play a minor role, showing no significant links to any of our outcome variables (see SM13 for plots showing estimated marginal means for gender, education, and income).

Turning to information-related variables, which were assessed separately for each context, we examined the importance of news, entertainment, and personal communication, and media use. Assigning **importance to news, entertainment, and personal communication** is positively associated with appreciation across all contexts,

with the strongest links observed for news ($\beta = 0.28, p < .001$) and entertainment ($\beta = 0.26, p < .001$). In contrast, there are no significant associations between importance and overload. Thus, while higher importance consistently links to higher levels of appreciation, it does not necessarily translate into lower levels of overload (see SM14). When examining **media use predictors**, we observe that higher **self-reported frequency of use** of news and entertainment is positively related to appreciation (news: $\beta = 0.10, p < .001$; entertainment: $\beta = 0.07, p < .05$). However, the pattern for personal communication is more complex. In this context, frequent use is associated not only with lower appreciation ($\beta = -0.06, p < .05$) but also with lower overload ($\beta = -0.08, p < .05$). In other words, higher levels of personal communication are linked to a reduced appreciation of information and content from this domain. Simultaneously, the association with lower overload suggests that when individuals experience less information overload, they may engage in personal communication more frequently (see SM15). Given the cross-sectional nature of our data, the interpretation of these findings remains challenging. Using **messenger apps** and **social media** to access news, entertainment, or personal communication is, when significant, associated with higher appreciation of information abundance in the respective contexts (SM16). However, because the direction of causality cannot be determined from the data, it is also possible that individuals who appreciate the abundance of information in a given context are more likely to use social media and messenger apps to obtain that content. Additionally, social media use is positively related to news overload ($\beta = 0.12, p < .05$). Interestingly, frequent use of messenger apps for personal communication is strongly associated with lower levels of overload in that context ($\beta = -0.32, p < .001$), which may indicate that using messenger apps helps mitigate overload experiences or, alternatively, that individuals who are less prone to feeling overwhelmed are more likely to engage in personal communication via these apps.

Discussion and Conclusion (S2 and S3)

With the rise of digital media and, more recently, AI-driven technologies, information has become increasingly ubiquitous across various media contexts. This study

aimed to holistically describe people's experiences of living in a world filled with abundant information (cf. Boczkowski, 2021). While prior research has mostly addressed the issue of profusion by framing it as information overload—often characterized as a kind of psychological pathology (cf. Neuman, 2016, p. 99)—our approach sought to offer a more complete account by examining both the perceived positive and negative aspects of information abundance. By acknowledging the challenges and benefits of information abundance, this approach moves beyond a one-sided and normatively connotated narrative, offering a more balanced perspective on people's lived experiences.

Against this background, this study makes both conceptual and methodological contributions: On a conceptual level, we first defined *information abundance* as a macro-level condition characterized by large amounts of information that are readily available to individuals. Building on this, we draw a distinction between information abundance as a macro-level external state and *information overload as a* micro-level *subjective* state: the experience of strain resulting from exposure to too much information, typically experienced negatively. Introduced as a new concept, *information appreciation* captures the positive evaluative response to information abundance, such as enjoyment, enrichment, or stimulation derived from the availability of plentiful information. Importantly, our framework and findings propose that information overload and information appreciation are not mutually exclusive; rather, they are distinct but potentially co-occurring individual-level responses to information abundance. They can arise simultaneously, fluctuate over time, and complement each other.

On a methodological level, we developed and applied a survey measure, the **Information Overload and Appreciation Scale (IOIAS),** employing a mixed-methods approach. The scale was informed by prior research as well as new conceptual developments. It was derived through qualitative interviews and tested through two survey studies based on data from the German-speaking part of Switzerland. We tested the scale's reliability and various forms of validity, all of which yielded satisfactory results. The new scale enables the measurement of overload and appreciation as responses to information

abundance in different media contexts, allowing for insights into the frequency of these experiences. To achieve this, we deliberately excluded elements from earlier scales that emphasized decision-making under time pressure, as such constraints are not inherent to all forms of media use and would have narrowed the scope of our measure.

Our study also advances empirical research on individuals' experiences within digital information environments. Employing the IOIAS, we examined the prevalence of both information overload and appreciation across the domains of news, entertainment, and personal communication, thereby offering a comprehensive perspective on how people encounter information abundance. Notably, our findings indicate that appreciation is by far the more common response, a trend observed consistently across all three contexts. Information appreciation was especially widespread in personal communication and least frequent in news. Still, the relatively high appreciation of news is remarkable, given the prevailing view of the news context as characterized by an overabundance of negatively charged information (Soroka & Krupnikov, 2021). Meanwhile, perceptions of overload were most frequent in the news context when compared to entertainment and personal communication. Collectively, these results underscore the context-dependent character of information abundance experiences: while appreciation predominates overall, particular media contexts—such as news—may heighten susceptibility to overload due to factors extending beyond sheer information volume.

Our analysis showed only small socio-structural differences in overload and appreciation. The clearest divide appeared across **age**: younger people reported more overload, echoing earlier findings (Schmitt et al., 2018; Song et al., 2017) but also more appreciation. This likely reflects their greater digital engagement: Exposure that increases awareness of abundant content but also fosters overload, partly through dynamics like FOMO. Older adults, by contrast, often rely on habitual, selective media use, which may buffer overload while limiting opportunities for appreciation (Nguyen et al., 2021). Other socio-demographic differences were minor. While **income** showed no links with any of our outcome variables, higher levels of **education** were associated with higher overload

experiences in the personal communication context. We found no **gender** gap in overload, in line with Schmitt et al. (2018) but diverging from Newman et al. (2024). However, we identified notable gender differences in news and entertainment appreciation, with men reporting higher levels than women, suggesting that men may derive greater benefit from abundant information in these settings.

Additionally, we found that **perceiving information as important** did not diminish overload (in line with Lee et al., 2016; Schmitt et al., 2018), but was strongly tied to higher appreciation across all contexts. This indicates that those who value content from these domains are also more likely to appreciate information abundance. Patterns regarding media use were mixed: for news and entertainment, greater self-reported **exposure** correlated with increased appreciation but not overload, whereas in personal communication, frequent use was linked to declines in both appreciation and overload—possibly reflecting routinization or fluctuating interaction quality. Platform-specific trends echoed these results: **messenger use** predicted lower overload in personal communication and higher appreciation in news and entertainment. Similarly, **social media use** was linked to heightened appreciation in news and personal communication but was associated with increased overload in the news context (cf. Matthes et al., 2021), highlighting both the benefits and strains of informational abundance.

Theoretical implications

Supporting our conceptual argument that overload and appreciation are complementary rather than mutually exclusive, our analyses revealed small positive correlations (rather than negative correlations) between our respective measures, both within and between contexts. We also found a small share of individuals perceiving both overload and appreciation *frequently*. This pattern was also supported by qualitative data, where participants described various situational experiences of overload but often expressed appreciation for having access to such a vast amount of information. Such ambivalent reactions to digital media have also been observed in other studies where users

experienced a high level of functional support from digital media, but also felt a high loss of control over their use (Vanden Abeele & Nguyen, 2024).

This raises the question of how overload and appreciation are interlinked. One straightforward explanation is that people respond differently to information abundance, depending on context, media type, situational demands, or cognitive resources (Schmitt et al., 2018). Overload in one moment may be followed by appreciation in another, reflecting the fluid and complex nature of human experiences. Future research could use our new frequency measure to track these shifts over time, such as throughout a typical week or an election period (e.g., Metag & Gurr, 2022).

Building on this, another possible explanation relates to differences in assessment levels. Many of our focus group participants described overload to occur temporarily and in response to specific moments rather than continuously. In contrast, information appreciation may reflect a more general, reflective evaluation of information abundance. That said, people may overall recognize the value of abundant information even if they occasionally feel overwhelmed by it. This highlights the multifaceted nature of people's experiences with information abundance, where both immediate reactions and more abstract, overarching assessments shape how abundance is perceived.

Limitations and future research

While this study makes important contributions, there are several limitations that warrant consideration. First, the scope of the data, which is based solely on a sample from the German-speaking part of Switzerland, raises questions about the generalizability of our findings to other cultural and linguistic settings. Applying the IOIAS in other countries and language contexts would be a worthwhile direction for future research, as it could reveal cross-cultural differences or similarities in how information abundance is experienced and assessed. Cognitive interviewing could be used to better understand the scale's applicability in other contexts.

Second, although our results clarify the empirical distinctiveness and co-occurrence of overload and appreciation, we did not conduct additional qualitative analyses (e.g., analysis of "nouns" generated in Study 1) to map specific objects, contexts, or valences associated with these experiences. Such analyses could illuminate whether overload and appreciation depend on distinct informational settings, media types, content features, or, as theorized above, operate at different levels of generality or specificity. Future research should more closely examine these contextual associations and experiential objects to deepen understanding of the mechanisms and boundaries of ambivalence and co-occurrence.

Third, while the IOIAS captures experiences with the quantity of information in different contexts, it does not account for perceptions of **information quality**. However, negative responses to information abundance, such as overload, may be influenced not solely by volume but by content characteristics such as negativity, quality, or complexity (e.g., Metag & Gurr, 2022; Schmitt et al., 2018). Since such features can either mitigate or intensify feelings of overload or appreciation, future work should integrate measures of information quality alongside quantity.

Finally, although our analysis sheds light on differences between media contexts, socio-structural factors, information-related and media use variables, it leaves several promising variables unexplored. Future research could investigate variables that may help explain the emergence of overload and appreciation, as well as those that may be linked to their consequences. This includes multi-tasking behaviors as potential precursors of both overload and appreciation, coping strategies, such as selective exposure, filtering, avoidance (Volk et al., 2024), or well-being (e.g., Matthes et al., 2021). Previous research has linked overload to feelings of stress, anxiety, or cognitive fatigue, while appreciation may be associated with feelings of control, inspiration, serendipity, or a sense of enrichment. Future research could leverage the IOIAS to bridge communication subfields (Tenenboim-Weinblatt & Lee, 2020) and develop a more comprehensive understanding of

how individuals navigate and respond to information abundance across diverse temporal contexts, media environments, and cultural settings.

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Supplementary Material

Contents

Study 1

SM1: Screening Survey

Participants for our study were recruited using various strategies to reach people of different backgrounds, including: the distribution of leaflets in cities via students, friends, and family; social media posts in various Facebook and LinkedIn groups; direct emails to various organizations of the Swiss community (e.g., church communities, military, choirs, sports associations). In our communication we claimed that the study aims to explore the role that media play in Swiss peoples' lives without mentioning information abundance. Flyers, emails, and social media posts directed participants to a website about the study (see figure 1), which explained the procedure of participation and included a link to a screening survey.

The pre-survey asked potential participants for:

a) demographic information: their age, gender, citizenship, canton, occupation,
b) media use: frequency of internet use, smartphone use, tablet use, TV use, radio use, print news use, other media use, and digital confidence
c) contact information: email and/or phone number.

108 individuals participated in the screening survey. We used this data to select individuals for our study and ensure diversity, mainly focusing on age, gender, and education. We excluded individuals with a background in communication science and those without Swiss citizenship.

After we selected and invited participants to a focus group interview, we informed them in detail about our study, adhering to APA ethical standards:

- Prior to the interview, they received a fact sheet per email, including information about the participants' right to interrupt study participation at any time, the voluntariness of the study, confidentiality, and data protection.
- Before the interview started, participants all signed an informed consent form.
- During the interview, we asked the participants again if they agreed to be video recorded before the start of the Zoom recording.
- After the interviews, participants received a debrief via email.

Figure 1. Recruitment Website Screenshot (05/05/2022)

Medien im Alltag

Herzlich Willkommen!

Wir danken Ihnen sehr für Ihr Interesse an unserer Studie "Medien im Alltag". Wir möchten besser verstehen, wie Schweizerinnen und Schweizer die heute verfügbaren Kommunikations- und Informationsmedien im Alltag nutzen und erleben. **Unsere Studie besteht aus einer kurzen Online-Umfrage und einer virtuellen Gruppendiskussion (ca. 1 Stunde).**

Wie kann ich teilnehmen?

Schritt 1: Nehmen Sie noch heute an einer **kurzen Online-Umfrage** teil, damit wir Sie besser kennenlernen können. Wir möchten beispielsweise wissen, wie alt Sie sind, welchen Bildungsabschluss Sie haben und wie oft Sie täglich das Internet nutzen. Diese Informationen benötigen wir, um Sie für die in Schritt 2 beschriebenen Gruppengespräche einzuteilen.

↗ Über diesen Link kommen Sie direkt zur Umfrage. **Es dauert nicht länger als 5** Minuten und Sie können unsere Fragen am Smartphone, Tablet oder PC beantworten.

Schritt 2: Basierend auf den Ergebnissen der kurzen Online-Umfrage, werden wir Sie zu einem **Gruppengespräch im April** (vor und nach Ostern) mit bis zu sieben anderen Personen einladen. Die Gespräche finden online (auf Zoom) statt und dauern circa eine Stunde. **Ihre Teilnahme an einem Gruppengespräch vergüten wir mit CHF 30.**

Wir werden Sie Anfang April 2022 kontaktieren und Ihnen mögliche Termine für ein Gruppengespräch vorschlagen. Wir werden Ihnen dann auch weitere Informationen zum Ablauf des Gesprächs geben (z.B. technische Hinweise zu Zoom und zur Vergütung). Selbstverständlich werden alle gesetzlichen Bestimmungen des Datenschutzes eingehalten.

Studienleitung

SM2: Sample Description

The final sample consisted of 40 individuals, who participated in the focus group discussions on Zoom.

We divided participants into two age groups (Table 1): Four of our groups were aged 20-40 years (18 participants), another four groups were aged 48-79 years (22 participants). Participants are almost equally distributed in terms of gender (19 women, 21 men). More than half of the participants hold a university degree, which is more than the proportion of people with tertiary education in Switzerland[4]. Individuals came from 13 out of 21 German-speaking Swiss cantons; people from rural areas were underrepresented.

37 participants reported in the screening survey that they use the internet at least 6 to 10 times a day; two participants reported they used it 4 to 6 times a day; one participant used the internet only about 4 to 6 days a week. Participants in the younger age groups (aged 20-40 years) felt much more confident about using digital media than the older age groups (aged 48-79 years).

Table 1. Sample description of focus group study

Age group	**Partici-pants**	**Female**	**Age**		**Higher ed.**	**Internet use**		**Digital confidence**	
	N	%	M	SD	%	M	SD	M	SD
„Young“ (20-40)	18	49	27.9	5.45	61	1.3	0.46	4.8	0.81
„Old“ (48-79)	22	49	60.9	9.16	50	1.9	0.94	3.6	1.00
Overall	40	49	46.0	18.28	55	1.6	0.81	4.2	1.08

Notes. Internet use was measured on a 8-point frequency scale: 1 always / more than 10 times a day – 8 less than once a week. Digital confidence was measured on a 5-point scale: 1 not at all – 5 very much

[4] https://www.oecd.org/education/education-at-a-glance/EAG2019_CN_CHE.pdf

SM3: Interview Guide

We developed a semi-structured interview guide based on our research questions and previous research (Kaiser, 2014). It consisted of four thematic blocks (Part I-IV) and ten open-ended questions (Q1-10) (see Table 2) and was designed open and flexible to allow new themes to emerge.

In order to ascertain whether participants perceived abundance at all, in the first thematic block (Part I), we asked them to reflect on the changes they perceived in the media landscape over the past years (Q2). Abundance was mentioned as one of the most important changes in all focus groups, which allowed us to transition to the second thematic block (Part II) and continue with questions about their experience of abundance in different media contexts. After discussing both negative and positive aspects related to abundance, we moved to the third thematic block (Part III) and asked about the strategies they use to deal with the abundance in different media contexts. We concluded the interview in the fourth thematic block (Part IV) by asking all participants for a concluding statement on their assessment of abundance.

For the present study, we specifically analyzed the responses to Q3, 4, and 5 in Part II and Q9 in Part IV, which asked how people experienced and assessed abundance.

Table 2. Interview guide

Introduction to the study [Welcome and background on the study]
Part I: Description of the media environment (10 minutes) - Q1: Could you illustrate what media you use in your everyday life? For example, today, what media did you use today and for what purpose? - Q2: Thinking beyond your personal media use, and reflecting about the information or media environment that surrounds us on a daily basis: what has changed compared to the past? By "in the past" I mean, for example, in the last 10 (for older people: the last 10 to 20) years?
Part II: Experience of abundance (20 minutes) Some of you have already touched on an aspect that is of particular interest to us. And that is

the amount or volume of information [in the contexts mentioned by participants: news, entertainment, personal communication] that surrounds us every day. - Q3: How do you perceive this volume? Are there rather too many offers [in the contexts mentioned: news, entertainment, personal communication] today or are there too few offers? - Q4: Do you find anything good about the fact that there are so many offers [in the contexts mentioned by participants: news, entertainment, personal communication] available to us today? - Q5: Do you find anything problematic about the fact that there are so many offers [in the contexts mentioned by participants: news, entertainment, personal communication] surrounding us today?
Part III: Navigating abundance (20 minutes) - Q6: I would now like to ask everyone to recall a specific situation in your everyday life in which the amount of offers particularly disturbed you? How did you feel in this situation? - Q7: If you consider the amount of offers [in the contexts mentioned: news, entertainment, personal communication] as overloading or negative, how do you deal with it? - Q8: Do you use any particular strategies or solutions to deal (well) with the information supply [in the contexts mentioned by participants: news, entertainment, personal communication]?
Part IV: Assessing abundance (7 minutes) We are now nearing the end of our discussion. - Q9: In conclusion, how would you rate the availability of information and entertainment? Under which conditions or in which areas is it rather good or rather bad? - Q10: Last but not least, I would like to hear from everyone what they take away from today's discussion for their personal media use in everyday life.
Closing - Does anyone else have anything that wasn't addressed in the conversation but might be of interest now? [Thank you]

SM4: Codebook and Qualitative Data Analysis

The codebook is available here:
https://osf.io/fkrqp/?view_only=662fa4dc300745289629c8a70bc65e27

The focus groups had an average length of 60 minutes, leading to 460 minutes of recorded audio. The audio material was fully transcribed, anonymized, and analyzed in the software MAXQDA. The dataset was analyzed by two lead researchers, who read the material multiple times and double-coded all transcripts.

A structured approach to qualitative content analysis was used (Rädiker & Kuckartz, 2019) to identify and organize patterns of meaning, combining deductive and inductive categories. Existing concepts from the literature were used to identify and organize the data into key categories. This involved, for example, the three contexts (news, entertainment, and personal communication) or overload descriptions. New themes led to the inductive development of categories, which were organized through the strategy of subsumption under existing categories (Schreier, 2012). For example, positive or ambivalent experiences and assessments of abundance were inductively developed.

The following provides an overview of the structure of the codebook relevant for this paper.

Part II: Experience of abundance

- Contexts in which abundance is experienced
  - News
  - Entertainment
  - Personal communication
  - Other (work, advertising)
- Levels at which abundance is experienced
  - Content abundance
  - Source abundance
  - Device abundance
- Individual-level consequences of abundance experience
  - Negative: overload (e.g., emotional drain, stress, or decreased well-being)
  - Positive: appreciation (e.g., high choice, helpful, or increased well-being)
  - Ambivalent/indifferent: positive and negative or no consequences

Part IV: Concluding assessment of abundance

- Negative (“too much”; “too few”)
- Ambivalent (“double edged sword”) or indifferent (“does not affect me”)

- Positive (“right amount”)

Intercoder reliability

All transcripts were double-coded, but we did not attempt to determine the reliability of the coding framework with inter-rater reliability scores because coding was understood to be a reflexive process (Schreier, 2012). Given that reflexivity of the researchers is central to qualitative research, we took notes after each focus group interview and continuously questioned the values and ideologies of us as the researchers, and discussed these related to the results’ interpretation with each other.

SM5: Items and Exemplary Quotes

Table 2. Items and exemplary quotes from the focus group study

English translation	**German version**	**exemplary quotes**
1. exhausts me	erschöpft mich	When I think of the corona pandemic, when the new figures came out every day or almost every day, how many people were infected and died again, etc., that can be exhausting.
2. stresses me out	stresst mich	I don't have any push messages at all, for example in WhatsApp. I've turned everything off so that I don't get anything anymore because I've increasingly noticed how it's stressing me out.
3. leaves me confused	verwirrt mich	I just had the feeling: should I take this one [book] or that one? what if I choose one now and then it's the wrong one. (...) it's an excessive demand and also a lack of knowledge, because I don't know which one is the best.
4. unsettles me	verunsichert mich	There are so many news sources and there is also so much fake news that comes in via these sources that it is difficult to decide: Where do I listen to and how? (...) It's really difficult to find the exact sources that you can count on.
5. distracts me	lenkt mich ab	At the end of February, at the beginning of the war, I was in CITY for four days and just wanted a bit of peace and quiet […] and this flood of information kept me from doing anything else.
6. overloads me	überlastet mich	I felt exactly the same with Corona. (...) It was a flood. I stopped consuming media because I just couldn't take it anymore. Because it was just really too much and no longer bearable with the amount that came in, always the same thing in a quantity that was no longer manageable.
7. overwhelms me	überfordert mich	For example, I don't have Netflix or anything like that, but I once had it as a trial month and it overwhelmed me relatively easily.
8. scares me	macht mir Angst	I really see the dangers when I work with my students and how important it is to educate them about media.
9. puts me under pressure	setzt mich unter Druck	I think people are sometimes overfed with news. Of course, you can regulate that yourself. But I think you're always under pressure. It used to be calmer and more orderly.

10. annoys me	nervt mich	I might not have my cell phone with me one afternoon and then I take it out and then it's just so full of messages (…) from friends or emails from work. An overload of content that I then have to deal with, which annoys me and stresses me out.
11. bothers me	stört mich	The newspaper is always full of culture on Mondays. Culture, culture, culture, everything that happened over the weekend. And it actually bothered me, but I realized that there are other people who like culture.
12. stimulates me	regt mich an	I think it's very positive that you can talk a lot about WhatsApp and other people who can provide information and other perspectives, so you get a bit more of a world view.
13. excites me	begeistert mich	With Corona, for example, I couldn't get enough of it. (...) I was really interested in all the research behind it and I listened to countless podcasts about it or countless podcasts sprouted up about how not to go crazy during the lockdown or some kind of mental health stuff. And I always found it all really exciting.
14. satisfies me	stellt mich zufrieden	I like the variety and the simplicity. Now you don't have to fight so hard to find different radio or TV stations anymore. It used to be an art in the past. You needed special equipment, and sometimes it was very expensive, like shortwave. Now you can get everything very easily on your cell phone.
15. inspires me	inspiriert mich	I think it's very good that there is so much in the area of information, but above all there is a lot of learning content today and I think that's good because it introduced me to topics that I wouldn't otherwise have dealt with.
16. helps me	hilft mir	Some people don't like crime fiction at all, but I'm a big crime fiction fan. I think the wide range on offer really helps to ensure that there's something for everyone. It actually confirms to me all the more that it's not that bad, even if it is trash.
17. makes me happy	macht mich froh	I actually find the amount of supply positive (...) So if I have some obscure question about some niche topic, then I'm happy if someone has written something about it on the Internet and there's a community dedicated to it.
18. relieves me	entlastet mich	It's convenient to have virtually the whole world at your fingertips from home and you don't have to go out.

Study 2

SM6: Questionnaire Extracts Study 2

Information Overload and Information Appreciation

We implemented our new questions in the middle of the questionnaire (pages 12-14), dedicating one survey page to each of the three contexts (news, entertainment, and digital personal communication). These pages were randomized across participants.

📰 The amount of information and offerings available today in the area of news (e.g., on television, radio, or online)...

🎭 The amount of information and offerings available today in the area of entertainment (e.g., on television, radio, or online)...

💬 The amount of information and offerings available today in the area of digital personal communication with acquaintances, friends or family (e.g., via WhatsApp, Email, or telephone),...

Scale
never – seldom – now and again – often – always / don't know

Items
[negative]
- ...exhausts me
- ...stresses me out
- ...leaves me confused
- ...unsettles me
- ...distracts me
- ...overloads me
- ...overwhelms me
- ...scares me
- ...puts me under pressure
- ...annoys me
- ...bothers me

[positive]
- ...stimulates me
- ...excites me
- ...satisfies me
- ...inspires me
- ...helps me
- ...makes me happy
- ...relieves me

[indifferent]
- ...is indifferent to me
- ...does not affect me

SM7: Questionnaire Guidance

After obtaining their consent, participants were informed on page 3 of the questionnaire that the survey covers three distinct media contexts: news, entertainment, and digital personal communication. Acknowledging that it could be quite demanding to respond to the same questions three times while staying attentive to the specific context, we used a specific symbol to represent each context that was placed on the respective survey pages (e.g., a newspaper emoji for news; see below).

Questionnaire pages 4-6 provided an initial question along with detailed definitions for each area, allowing participants to directly apply the definitions in their responses to this initial question. We instructed participants that these definitions could be found at the bottom of all relevant survey pages and asked them to pay attention to the symbols and consult these explanations as needed to ensure their responses accurately reflected their experiences of abundance in the correct context.

The questionnaire extracts reported below have been translated from German into English for this publication.

The complete German-language questionnaire is available here:

Page 3: participant instructions

This survey covers three different areas, which we have labelled with the following symbols:

News
Entertainment
Digital Personal Communications

We'll explain exactly what we mean by these areas on the next page. You will also find this information at the bottom of each page of the questionnaire. This means you don't have to memorise it and can refer back to it as you go along. Please always look out for these symbols so that you know what a question refers to. Thank you very much .

Pages 4-6: presentation of our three definitions

In this box we explain what we mean by news:

Information and Offerings in the Area of News
News refers to national, international, regional or local news, reports, announcements and other current information provided through any medium (e.g., radio, television, newspaper or online in a news app or on social media such as Instagram).

In this box we explain what we mean by entertainment:

Information and Offerings in the Area of Entertainment
Entertainment refers to films, series, soaps, video clips or also music, radio plays, podcasts, books, comics and computer games made available through any medium (e.g., radio, television, magazines or online on YouTube, TikTok, streaming services).

In this box we explain what we mean by digital personal communication:

Information and Offerings in the Area of Digital Personal Communication
Digital personal communication can be by phone, email, text message, social media or also messenger apps such as WhatsApp or Telegram. We are NOT referring to face-to-face communication that takes place in personal, physical meetings.

SM8: Deletion of Items

To create smaller, yet diverse sets of negative and positive items that work well across all three contexts, we refined the scale by excluding items with similar semantic value in German, while closely monitoring the items' loadings and differences across our three contexts. We made the following exclusions:

- "stresses me out"; retained "puts me under pressure" (r news/ent/pers = .704/.621/.692)
- "leaves me confused"; retained "unsettles me" (r news/ent/pers = .691/.745/.631)
- "overwhelms me"; retained "overloads me" (r news/ent/pers = .765/.720/.704)
- "bothers me"; retained "annoys me" (r news/ent/pers = .674/.664/.629)
- "stimulates me"; retained "inspires me" (r news/ent/pers = .613/.602/.656)
- "makes me happy"; retained "excites me" (r news/ent/pers = .639/.648/.583)

Bivariate correlations within these pairs showed high shared variance across all contexts. This left us with six negative and six positive items.

To facilitate shorter measurements, we further refined the scale by excluding additional items.

- First, we omitted the item "annoys me" as it showed the weakest performance among the negative items. Despite focus group participants using this expression in relation to the information abundance in all three contexts, the EFA did not confirm annoyance as a consistent component of information overload experiences. In addition, no previous measure has yet relied on annoyance as a component of information overload.
- Second, we also excluded the items "exhausts me" and "scares me." While these may contribute to information overload experiences, they may be prone to gender-based response biases. Additionally, "scares me" did not perform consistently well across all three contexts.
- Third, we decided to omit "satisfies me" as it seemed less clear in meaning in relation to information abundance compared to the other items.

SM9: Factor Analysis (Step 2)

Table 3. Items' Factor Loadings, long-scale, Study 2

The amount of information and offerings available today in the area of…		news…		entertainment…		digital personal communication…	
		neg	pos	neg	pos	neg	pos
1.	exhausts me	0.772		0.846		0.734	
4.	unsettles me	0.820		0.866		0.731	
6.	overloads me	0.882		0.835		0.817	
8.	scares me	0.718		0.820		0.676	
9.	puts me under pressure	0.858		0.836		0.805	
10.	annoys me	0.581		0.652		0.581	
13.	excites me		0.737		0.820		0.803
14.	satisfies me		0.723		0.786		0.805
15.	inspires me		0.788		0.727		0.588
16.	helps me		0.759		0.688		0.738
	explained variance						

Study 3

SM10: Questionnaire Extracts Study 3

The full questionnaire in German language is available here:
https://osf.io/fkrqp/?view_only=662fa4dc300745289629c8a70bc65e27

Media Use
Media use was measured on 3 randomized pages early in the questionnaire (pages 6-8), using one page for each context (news, entertainment, and digital personal communication). For our analysis, only use of Messenger Apps and Social Media were relevant (underlined).

News Sources
This is about news: Which, if any, of the following did you use last week to follow news online and/or offline? Please select all that apply.

offline
TV news
24h-news television channels
Radio news
Printed newspapers or magazines
None
Other:___

online (Websites/Apps)
Newspapers or magazines
TV channels (incl. news in media libraries)
Radio stations (incl. news in audio libraries)
Messenger Apps (e.g., WhatsApp, Telegram, Signal)
Social media (e.g., Instagram, TikTok, YouTube)
News services that are only available on the internet (e.g. Watson, BuzzFeed)
News and information podcasts
None
Other:___

Don’t know

Entertainment Sources

🎭 This is about entertainment: Which of the following did you use last week to entertain yourself (in the sense of entertainment)[5], if any? Please select all that apply.

Series, films or documentaries via a streaming provider (e.g. Netflix, Disney+)
Series, films or documentaries on television (incl. smart TV and media library)
Audio books & podcasts (e.g. via Audible or Spotify, or on CD)
Music (e.g. via Spotify, on the radio or on CD)
Books or magazines (also via Kindl)
Messenger Apps (e.g. WhatsApp, Telegram, Signal)
Social media (e.g. Instagram, TikTok, YouTube)
Computer games
None
Other:___
Don't know

Digital Personal Communication Sources

💬 This is about digital personal communication: Which of the following options, if any, did you use last week for digital personal communication, for example to communicate with friends, acquaintances or family members? Please select all that apply.

Phone call(s) / video calls (e.g. Skype or FaceTime)
Emails (incl. e-cards)
SMS (incl. iMessage)
Messenger Apps (e.g. WhatsApp, Telegram, Signal)
Social media (e.g. Instagram, TikTok, YouTube)
None
Other:___
Don't know

Information Overload & Information Appreciation

📰 The amount of information and offerings available today in the area of news (e.g., on television, radio, or online)...

[5] In the German version, a brief explanation was added to clarify that "entertain" refers to engaging with media content rather than interpersonal interactions. This clarification addresses the homonymic nature of the verb "unterhalten" in German. This clarification may not be necessary in other languages.

 The amount of information and offerings available today in the area of entertainment (e.g., on television, radio, or online)...

 The amount of information and offerings available today in the area of digital personal communication with acquaintances, friends or family (e.g., on WhatsApp, e-mail or on the phone)...

Scale
never – seldom – now and again – often – always / don't know

Items
[negative]
- ...unsettles me
- ...distracts me*
- ...overloads me
- ...puts me under pressure
- ...annoys me*

[positive]
- ...excites me
- ...inspires me
- ...helps me

**We measured these items in Study 3 but did not use them for the scale.*

Information Overload (adapted from Matthes et al., 2021)
Do you agree or disagree with the following statements?

Scale

Disagree completely (1) to agree completely (7) / don't know

Items

- I often have the feeling that I get too much information to make good decisions.
- I am overwhelmed by the amount of information I have to process on a daily basis.
- I am often distracted by the amount of information I get.

Age
How old are you?
I am [open numeric field] years old.

Gender
What is your gender?
- Female
- Male
- Other, namely: _____

Education
What is the highest educational qualification you have?
- No completed school education or vocational training
- Primary school
- Lower secondary school, middle school, Progymnasium, pre-apprenticeship
- Vocational apprenticeship (2-4 years), federal diploma of vocational education and training (EFZ), federal vocational certificate (EBA), apprenticeship, commercial secondary school
- Upper secondary school, school baccalaureate (Matura), vocational baccalaureate, specialised baccalaureate, specialised middle school, teacher training college
- Passelle certificate, additional diploma, other university admission, nursing training, other medical training
- Higher technical college (HF), professional examination, federal certificate, federal diploma
- Other higher education
- University, university of applied sciences (FH), university of teacher education (PH): Bachelor's degree / further education
- University, university of applied sciences (FH), university of teacher education (PH): Master's degree / licentiate / diploma / state examination

Income
If you add up the income from all sources, what is the total net income of your household? If you do not know the exact figures: Please give an approximate estimate of your household's monthly net income.

Approximately per MONTH [drop down menu]

Perceived Information Importance (cf., Metag & Gurr, 2023)
How important are news, entertainment, and digital personal communication for you personally in your everyday life, if at all?

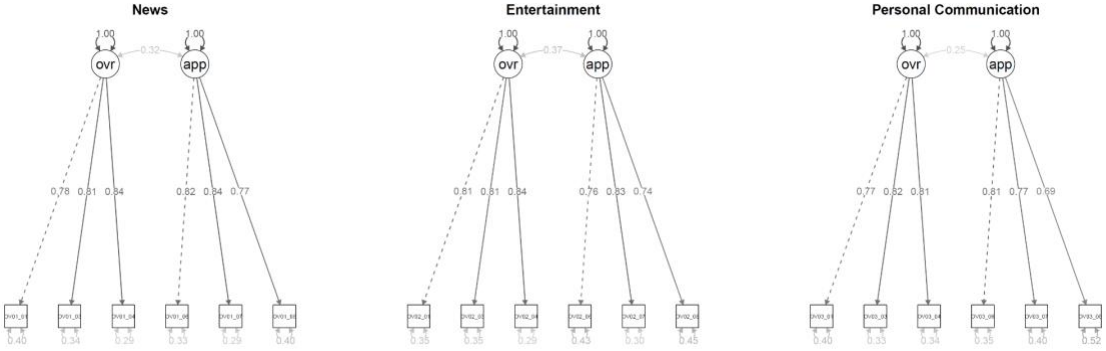
Scale
not important – hardly important – partly important – rather important – very important / don't know

Items

- 📰 News
- 🎭 Entertainment
- 💬 Digital personal communication

SM11: Measurement Models

Measurement Models of Information Overload and Appreciation Across Contexts



SM12: Regression Analyses for Overload and Appreciation in News, Entertainment, and Personal Communication.

	News Overload	News Appreciation	Entertainment Overload	Entertainment Appreciation	Pers. Comms. Overload	Pers. Comms. Appreciation
(Intercept)	2.40 ***	2.80 ***	2.22 ***	3.02 ***	2.48 ***	3.09 ***
	(0.07)	(0.06)	(0.07)	(0.06)	(0.09)	(0.08)
Age	-0.21 ***	-0.16 ***	-0.27 ***	-0.12 ***	-0.30 ***	-0.03
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Gender (*Male*)	-0.09	0.09 *	0.07	0.16 ***	-0.01	-0.01
	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)
Education (Obligatory)						
Secondary	0.01	-0.09	-0.02	-0.09	0.19 **	-0.09
	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)	(0.06)
Tertiary	0.05	-0.02	-0.03	-0.05	0.26 ***	-0.05
	(0.08)	(0.07)	(0.08)	(0.06)	(0.08)	(0.07)
Income (Low)						
Middle	-0.01	0.08	-0.05	0.04	-0.05	0.04
	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)	(0.05)
High	-0.09	0.07	-0.09	0.03	-0.05	0.01
	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)	(0.06)
Context-specific predictors						
Importance	-0.02	0.31 ***	0.02	0.28 ***	-0.03	0.24 ***
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Frequency	0.02	0.10 ***	-0.03	0.06 **	-0.06 **	-0.07 **
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Messenger apps	0.06	0.26 ***	0.09	0.11 *	-0.33 ***	0.01
	(0.05)	(0.04)	(0.05)	(0.04)	(0.08)	(0.07)
Social media	0.12 *	0.13 **	-0.08	-0.03	0.02	0.27 ***
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.04)
N	1758	1756	1760	1760	1762	1760
R^2	0.07	0.24	0.07	0.18	0.10	0.12

Note. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. **Standardized beta coefficients** (first row) and **standard errors** (in parantheses) are reported for each predictor. **Context-specific predictors** refer to predictors measured separately for each media context (news, entertainment, and personal communication). Specifically: **Importance** refers to the importance of news, entertainment, or personal communication; **Frequency** refers to frequency of use of news, entertainment, or personal communication. **Messenger apps** and **Social media**

refer to using each of these specifically for news, entertainment, or personal communication; **Abundance** reflects the perceived abundance of information within a given context.

SM13: Mean Scores, Standard Deviations, and Prevalence of Information Overload and Appreciation by Context

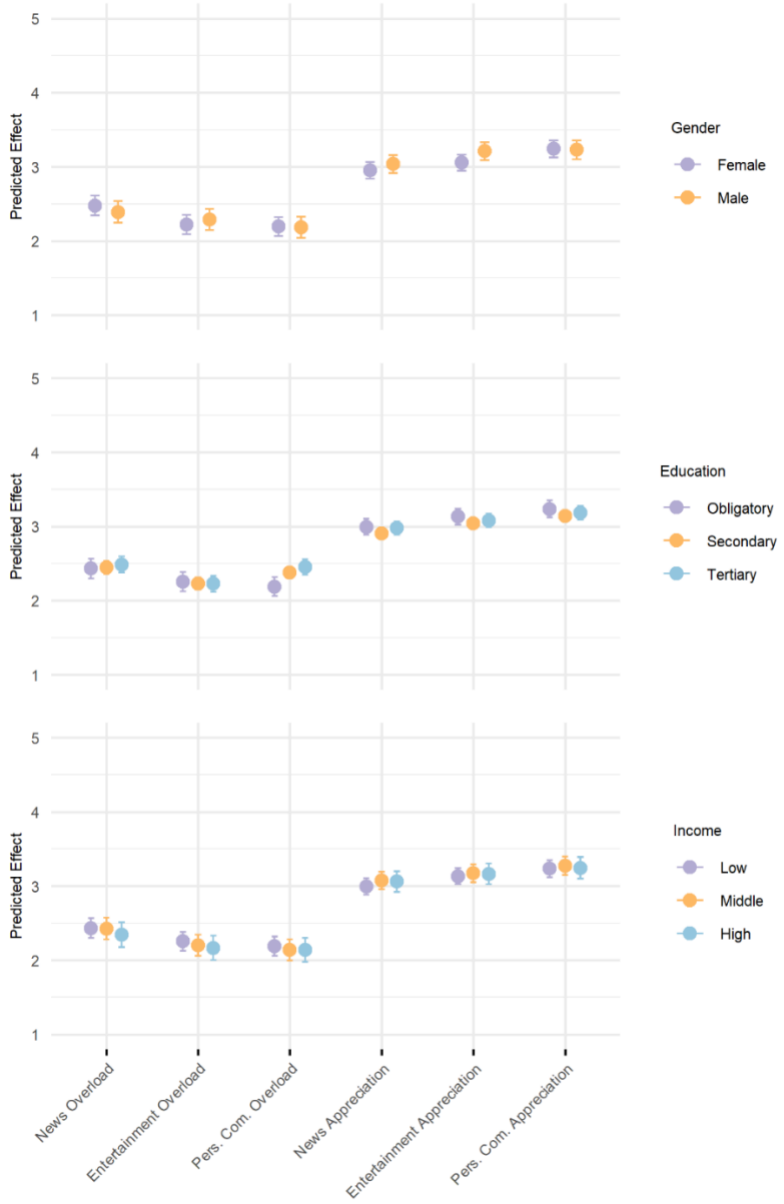
The table shows means and standard deviations for the items as well as for mean indices computed based on these items. Small differences show across contexts: For information overload, mean scores were highest for news (M = 2.43, SD = .96), followed by personal communication (M = 2.34, SD = .94) and lowest in entertainment (M = 2.19, SD = .96).

The table also shows the proportion of individuals who reported high overload (scores of 4 = often or 5 = always) across the three contexts, with 9.5% in news, 6.9% in entertainment, and 6.6% in personal communication.

Regarding appreciation, the highest means are observed in the personal communication context, followed by entertainment, and news. The percentage of those who report experiencing high levels of appreciation is twice as high compared with overload, with 16.5% for news, 19.2% for entertainment, and 22.6% for personal communication.

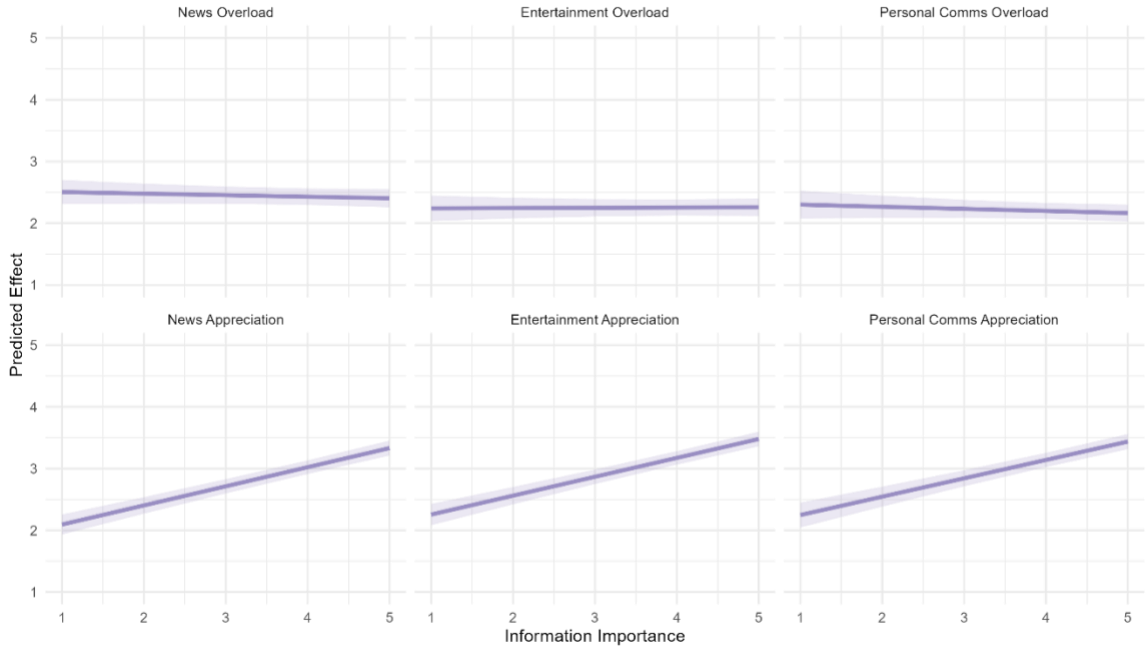
Variable	**News**	**Entertainment**	**Personal Communication**
Information Overload	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**
unsettles me	2.48 (1.09)	2.13 (1.06)	2.12 (1.06)
overloads me	2.54 (1.12)	2.33 (1.10)	2.47 (1.09)
puts me under pressure	2.27 (1.08)	2.09 (1.06)	2.44 (1.10)
Mean Index Overload	2.43 (0.96)	2.19 (0.96)	2.34 (0.94)
Percent Overload ≥4	9.50%	6.90%	6.60%
N	2025	2029	2028
Information Appreciation			
excites me	2.91 (1.02)	3.22 (0.96)	3.17 (1.00)
inspires me	2.84 (1.03)	3.04 (1.01)	2.98 (1.05)
helps me	3.16 (0.96)	2.98 (1.01)	3.38 (0.95)
Mean Index Appreciation	2.97 (0.88)	3.08 (0.85)	3.18 (0.85)
Percent Appreciation ≥4	16.50%	19.20%	22.60%
N	2023	2029	2025
Percent Ambivalent (≥4 for Overload and Appreciation	3.36% (*N*=68)	3.21% (*N*=65)	3.06% (*N*=62)
N	2’023	2’027	2’024

SM13: Estimated Marginal Means for Gender, Education, and Income Across Dependent Variables



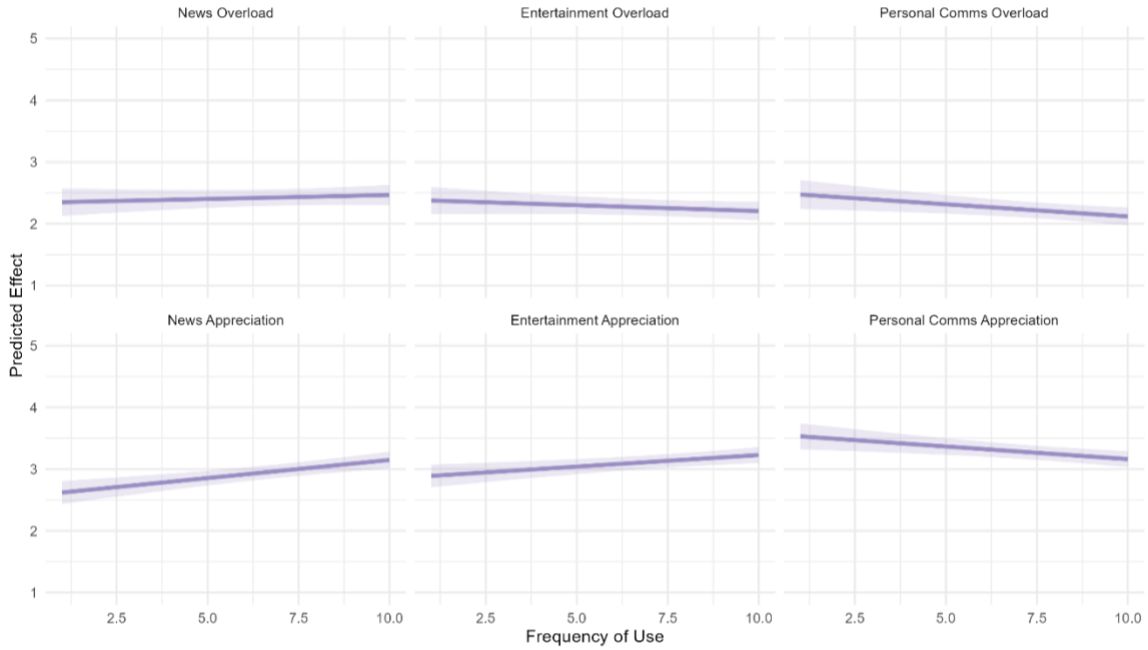
Note. Estimated marginal means are based on regression models shown in Table 3. The y-axis reflects predicted mean values ranging from 1 (lowest level of overload or appreciation) to 5 (highest level of overload or appreciation).

SM14: Estimated Marginal Means of Importance Across Different Dependent Variables



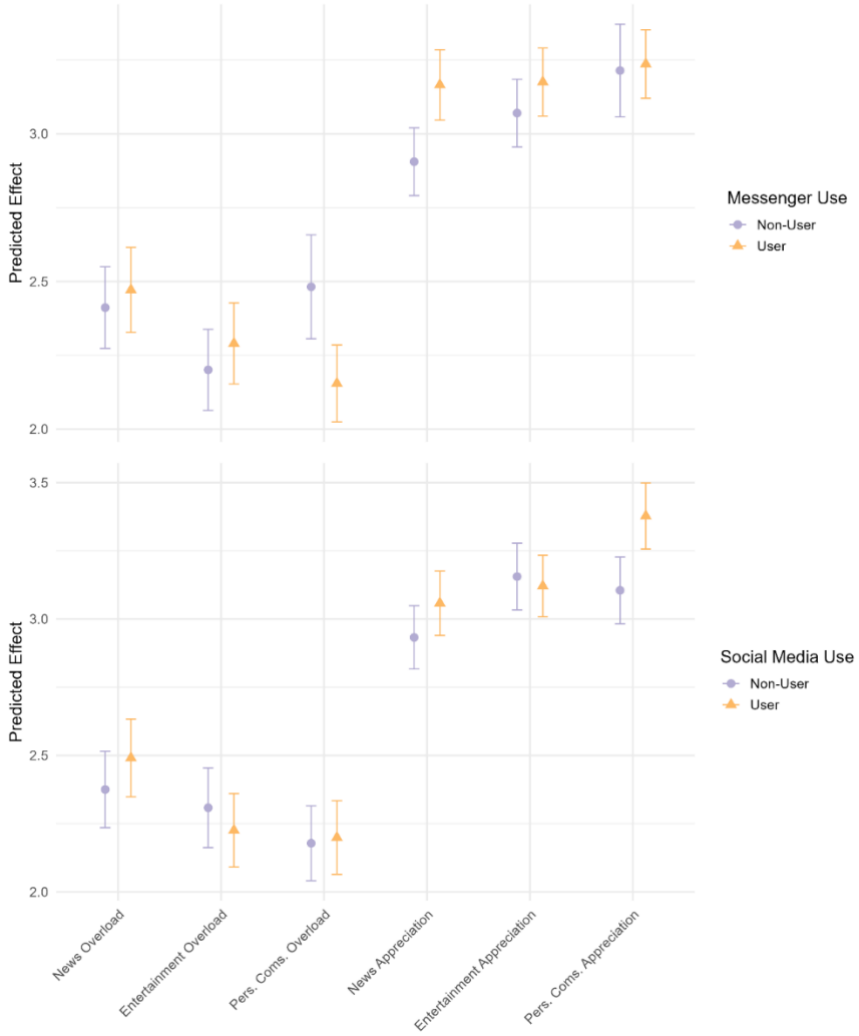
Note. Estimated marginal means are based on regression models shown in Table 3. The y-axis reflects predicted mean values ranging from 1 (lowest level of overload or appreciation) to 5 (highest level of overload or appreciation).

SM15: Estimated Marginal Means of Frequency Across Different Dependent Variables



Note. Estimated marginal means are based on regression models shown in Table 3. The y-axis reflects predicted mean values ranging from 1 (lowest level of overload or appreciation) to 5 (highest level of overload or appreciation).

SM16: Estimated Marginal Means of Messenger and Social Media Use Across Different Dependent Variables



Note. Estimated marginal means are based on regression models shown in Table 3. The y-axis reflects predicted mean values ranging from 1 (lowest level of overload or appreciation) to 5 (highest level of overload or appreciation).

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