Stress Management and Coping Using Smartphones by Mothers of Young Children

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Being a parent and the resulting responsibility for young children is associated with both joy and stress. High parental stress was shown to be associated with decreased parental wellbeing and negative consequences for child development. Thus, it is important that parents successfully cope with stress. Research has shown that becoming a parent often results in constraints on time allocation and a perceived state of isolation, making it harder to cope with stress. Smartphones might be a useful tool for parental stress management. For most parents, smartphones are always and easily accessible. Moreover, smartphones can provide a multitude of resources such as social support and information and can be used for short time periods. Accordingly, first studies show that parents often use their smartphones to cope with stress.

However, parental smartphone use has been widely problematized in academic and public discussions because smartphones are said to distract parents from interacting with their children. Research on how parents use smartphones to their benefit, in contrast, is still limited. Moreover, we do not know yet whether and under what circumstances coping using smartphones effectively reduces parental stress. To fill this knowledge gap, I examined in my dissertation how mothers of young children use their smartphones for coping with stress and under what circumstances coping using smartphones is effective. As mothers are still the primary caregivers, my dissertation mainly focuses on mothers.

In a first theoretical step, I conducted a systematic scoping review summarizing and integrating the previous literature on media use for coping. Many studies assessed how media are used for coping. However, the literature had not clearly identified where media have their place in stress management models. In the scoping review, I suggested placing media in the transactional model of stress and coping by differentiating between coping strategies, such as social support, distraction, or active coping, and coping tools, such as talking to a friend or

using a smartphone. When confronted with a stressful encounter, individuals choose a combination of coping tools and coping strategies to cope with stress. The fit of this combination with the situational circumstances determines whether the coping efforts are successful.

Based on this conceptualization, I conducted a qualitative focus groups study and a quantitative experience sampling study. In the focus group study, building on a synthesis of the literature on digital media use for parenting and smartphone use while parenting, I interviewed parents in a medium-sized city and a parent-child health retreat clinic about how they use their smartphones for stress management. In the experience sampling study, I additionally drew on theoretical conceptualizations from mobile communication and digital wellbeing research. Over 200 mothers filled in four questionnaires a day for one week and answered questions about a stressful situation that had happened in the last two hours.

Both studies showed that when mothers are in stressful situations with their children, they mainly use their phones to distract themselves from the stressful encounter and to find information and support. In the focus groups study, parents reported on many instances in which they have successfully used their phones for coping with stress. In the experience sampling study, mothers, however, experienced a smaller stress decrease in stressful situations in which they used their phone than in situations involving no phone use. Using positive phone content, though, was related to increased coping effectiveness.

My dissertation also demonstrated that social norms around maternal smartphone use play an important role when mothers use their phones for coping with stress. To explore this, I suggested a social constructivist viewpoint on media use and media effects. This viewpoint posits that the perception of and feelings around one's own media use are just as important for media effects as characteristics of objectively measurable media use, such as usage time. Further, I argue that these media use perceptions are influenced by what others say about media use and are, thus, socially constructed. Confirming the value of this viewpoint, I show in the

experience sampling study that mothers who perceived stronger injunctive norms against parental phone use experienced increased guilt when they used their phone for coping with stress. Feelings of guilt around phone use in turn were related to a diminished coping effectiveness.

Overall, my dissertation shows that by using positive content, mothers can use their smartphone to their benefit when they are confronted with stressful situations. Negative social norms against parental smartphone use can, by inducing guilt, be associated with diminished coping effectiveness when mothers use their phone to cope with stress. Therefore, academic and public discussions around smartphone use should consider the benefits of smartphone use for parents so that a more nuanced debate does not lead to social pressure and feelings of guilt among parents.

Stressbewältigung mittels Smartphones von Müttern kleiner Kinder

Eltersein und die damit einhergehende Verantwortung für kleine Kinder ist sowohl mit Freude als auch mit Stress verbunden. Studien haben gezeigt, dass ein hohes elterliches Stresslevel mit niedrigerem Wohlbefinden der Eltern zusammenhängt und negative Folgen für die kindliche Entwicklung haben kann. Daher ist es wichtig, dass Eltern Stress effektiv bewältigen können. Forschung hat gezeigt, dass die Geburt eines Kindes häufig zu Einschränkungen in der freien Zeiteinteilung und zu einem gefühlten Zustand der Isolation führt, was die elterliche Stressbewältigung erschweren sollte. Smartphones könnten ein nützliches Instrument für die Stressbewältigung von Eltern sein, da sie für die meisten Eltern jederzeit und einfach zugänglich sind. Darüber hinaus bieten Smartphones eine Vielzahl von Ressourcen wie beispielsweise den Zugang zu sozialer Unterstützung und Informationen und können sinnvoll für kurze Zeiträume genutzt werden. Passend zu dieser Argumentation zeigen erste Studien, dass Eltern ihre Smartphones häufig zur Stressbewältigung nutzen.

Allerdings wird elterliche Smartphonenutzung in der bisherigen wissenschaftlichen und öffentlichen Diskussion meist problematisiert, da Smartphones Eltern davon abhalten könnten, mit ihren Kindern zu interagieren. Es gibt bisher wenig Forschung dazu, wie Eltern Smartphones zu ihrem Vorteil nutzen. Außerdem ist unklar, ob und unter welchen Umständen Smartphonenutzung elterlichen Stress wirksam reduzieren kann. Um diese Wissenslücke zu schließen, untersuche ich in meiner Dissertation, wie Mütter von kleinen Kindern ihre Smartphones zur Stressbewältigung nutzen und unter welchen Umständen die Stressbewältigung mit Smartphones effektiv ist. Da Mütter nach wie vor den Großteil der Erziehung kleiner Kinder übernehmen, konzentriert sich meine Dissertation hauptsächlich auf Mütter.

In einem ersten theoretischen Schritt habe ich eine systematische Übersichtsarbeit erstellt, in der ich die bisherige Literatur zur Mediennutzung zur Stressbewältigung zusammengefasst und integriert habe. Viele Studien haben bereits untersucht, wie Medien zur Stressbewältigung eingesetzt werden. Bisherige Arbeiten haben aber bisher nicht eindeutig festgelegt,

welchen Platz Medien in Stressmodellen einnehmen könnten. In der Übersichtsarbeit schlage ich vor, Medien im transaktionalen Stressmodell zu verorten, indem ich zwischen Bewältigungsstrategien, wie sozialer Unterstützung, Ablenkung oder aktiver Bewältigung, und Bewältigungswerkzeugen, wie Gesprächen mit einem Freund oder der Nutzung eines Smartphones, unterscheide. Wenn eine Person mit einer stressigen Situation konfrontiert wird, wählt sie entsprechend dieser Konzeptualisierung eine Kombination aus Bewältigungsinstrumenten und Bewältigungsstrategien, um den Stress zu bewältigen. Die Passung dieser Kombination mit den situativen Umständen bestimmt dann, ob der Stress erfolgreich bewältigt wird.

Ausgehend von dieser Konzeptualisierung habe ich eine qualitative Fokusgruppenstudie und eine quantitative Experience Sampling Studie durchgeführt. Aufbauend auf einer Synthese der Literatur zur Nutzung digitaler Medien für das Elternsein und zur Smartphonenutzung während der Kinderbetreuung wurden in den Fokusgruppen Eltern in einer mittelgroßen Stadt und in einer Eltern-Kind-Kurklinik dazu befragt, wie sie ihre Smartphones zur Stressbewältigung nutzen. In der Experience Sampling Studie stützte ich mich zusätzlich auf theoretische Konzeptualisierungen aus der Forschung zur Mobilkommunikation und zum digitalen Wohlbefinden. Über 200 Mütter füllten eine Woche lang täglich vier Fragebögen aus und beantworteten Fragen zu einer stressigen Situation aus den vorangegangenen zwei Stunden.

Beide Studien zeigten, dass Mütter in stressigen Situationen, in denen sie mit ihren Kindern zusammen sind, ihr Smartphone hauptsächlich dazu nutzten, sich von der stressigen Situation abzulenken und Informationen und soziale Unterstützung zu finden. In der Fokusgruppenstudie berichteten Teilnehmende über viele Situationen, in denen sie ihre Smartphones erfolgreich zur Stressbewältigung einsetzten. In der Experience Sampling Studie kam es in stressigen Situationen, in denen das Smartphone genutzt wurde, verglichen mit Situationen ohne Nutzung jedoch zu weniger Stressreduktion. Die Nutzung positiver Inhalte war dagegen mit effektiverer Stressbewältigung verbunden.

Meine Dissertation zeigte außerdem, dass soziale Normen im Zusammenhang mit der

mütterlichen Smartphonenutzung eine wichtige Rolle spielen, wenn Mütter ihre Smartphones zur Stressbewältigung nutzen. Um dies zu untersuchen, habe ich als Teil meiner Dissertation eine sozialkonstruktivistische Sichtweise auf Mediennutzung und Medieneffekte vorgeschlagen. Diese geht davon aus, dass die Wahrnehmung der eigenen Mediennutzung und die Gefühle im Bezug auf die eigene Mediennutzung für Medieneffekte ebenso wichtig sind wie die Merkmale objektiv messbarer Mediennutzung, wie z. B. die Nutzungsdauer. Darüber hinaus nehme ich an, dass die eigene Wahrnehmung der Mediennutzung davon beeinflusst wird, was andere über die Mediennutzung sagen; Die Wahrnehmung der Mediennutzung wird somit sozial konstruiert. In der Experience-Sampling-Studie bestätige ich, dass diese Sichtweise wertvolle Erkenntniss liefert. Ich konnte zeigen, dass Mütter, die stärkere injunktive Normen gegen elterliche Smartphonenutzung wahrnahmen, vermehrt Schuldgefühle empfanden, wenn sie ihr Smartphone zur Stressbewältigung nutzten. Schuldgefühle in Bezug auf die Smartphonenutzung hingen wiederum mit einer weniger effektiven Stressbewältigung zusammen.

Insgesamt zeigt meine Dissertation, dass Mütter durch die Verwendung positiver Inhalte ihr Smartphone zu ihrem Vorteil nutzen können, wenn sie mit stressigen Situationen konfrontiert sind. Negative soziale Normen gegen die elterliche Smartphonenutzung können durch das Hervorrufen von Schuldgefühlen, mit einer niedrigeren Effektivität der Smartphonenutzung zur Stressbewältigung einhergehen. Daher sollten akademische und öffentliche Diskussionen über die elterliche Smartphonenutzung auch die Vorteile der Smartphonenutzung für Eltern berücksichtigen, sodass eine differenziertere Debatte nicht zu sozialem Druck und Schuldgefühlen bei Eltern führt.

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CONTENTS

General Introduction

"*Mummy was busy on Instagram*
When beautiful bubby fell out of the pram
And lay on the path unseen and alone
Wishing that he was loved like a phone."

Cartoonist Michael Leunig, 2019; The poem accompanied a cartoon picturing a mother looking at her phone while the baby had fallen out of the stroller, published in the Australian newspaper *The Age*.

"Mummy's exhausted. She's feeling alone.
So sometimes she sins with a small glowing phone."

Blogger Kate Moriarty, 2019, in a reaction letter to Leunig's cartoon, published on the Jesuit online journal *Eureka Street*. The line is meant as a critical extension of the poem by Michael Leunig based on her own experience as a mother.

Parental smartphone use has been widely problematized in academic papers and various media reports (Chokshi, 2019; Christakis, 2018; Davidovitch et al., 2018). Smartphones are said to distract parents from caring for and interacting with their children (Elias et al., 2021; Hiniker et al., 2015; McDaniel, 2019). Also parents themselves worry about their smartphone use: In a representative survey in the United States, 52% of parents reported that they "feel they spend too much time on [their] mobile device" and 45% even said to feel addicted to their phones (Robb, 2019).

Is parental smartphone use bad for families? Not necessarily: In a large survey study using a multiverse analysis, Modecki et al. (2020) found that while phone use which displaced family interactions was associated negatively with parent-child attachment quality, parental phone use itself was rather positively related to attachment quality. From their different analyses, Modecki et al. (2020) concluded "that scholars should move beyond blanket assumptions of risk and interrogate their assumptions regarding how parents should be making use of smartphones" (p. 8). Similarly, recent reviews summarizing previous research on parental smartphone use concluded that research focused to a large extent on the negative effects of parental smartphone use and did not look into potentially beneficial effects (Braune-Krickau et al., 2021; Knitter & Zemp, 2020). Thus, research is needed which provides a more differentiated

picture of how different kinds of parental smartphone uses are related to positive consequences for families.

One of the factors that seems to play a role in parental smartphone use is stress: In an interview study, parents reported both stress-reducing and stress-inducing effects of their smartphone use while parenting (Radesky et al., 2016). Similarly, in a longitudinal study, McDaniel and Radesky (2018a) found that increased parenting stress predicted increased technological interference with parent-child interactions ("technoference") over time. These studies suggest that parents seem to use their smartphones to cope with stress.

Indeed, smartphones might be suitable tools for parental stress coping. While parenting especially young children, parents face so-called "time-space constraints," a paraphrase of the barriers mothers face in terms of mobility and time allocation (Frantál & Klapka, 2020). Especially mothers report feeling restricted in pursuing self-care activities and activities out of their own interest (Nystrom & Ohrling, 2004; Widarsson et al., 2013), resulting in an overall experience of a "loss of time" and a "loss of control over one's life" (Barclay et al., 1997, p. 724). Thus, parents' opportunities to respond to a stressor seem to be limited by the continuous need to keep caring for their children.

Smartphones are easily accessible and always at hand (Richardson, 2007; Vorderer et al., 2016). As metamedia, they combine various functions and provide access to resources such as social support and information (Fortunati & Taipale, 2014; Humphreys et al., 2018). Moreover, smartphones can be used meaningfully for short periods (Andrews et al., 2015; Oulasvirta et al., 2012). Thus, for parents – who might only have limited time and can only invest limited effort into coping with a stressor – smartphones might be particularly suitable tools for coping.

While thus first studies suggest that parents use their smartphone to cope with stress, how parents use it, what factors determine if they use it, and if parents use their phone to reduce stress successfully remains unknown. The overall research question I want to investigate with my dissertation is, therefore:

How do mothers use smartphones to manage stress and under what circumstances is their stress management with smartphones successful?

In my dissertation, I will focus on the German context and on mothers. Mothers are still the primary caregivers in most societies (Craig & Mullan, 2011). Unequal distribution of childcare between mothers and fathers can also be observed in Germany. In 2019, a quarter of mothers with a child under six were on parental leave, while only 2% of fathers were on leave. This difference was even higher for children under three, with 42% of mothers and 3% of fathers being on parental leave (Statistisches Bundesamt, 2020). Looking at data from 2005 to 2013, mothers of children younger than 16 living in Germany spent over five hours per day with childcare, while fathers cared for their children on average one and a half hours per day (N. Peters, 2017).

Mothers thus spend more time with their children and, as a consequence, are also more likely to experience stressful situations while parenting. For a first examination of parental smartphone use for stress management while being with children, mothers are the more important target group and they will, therefore, be the focus of my dissertation. Further, I will focus on mothers of younger children (i.e., under seven years old). Caregiving in the sense of "watching over" is necessary especially for younger children. The aforementioned "time-space constraints," which might make the smartphone a particularly interesting coping tool, are especially true for parents of younger children (Frantál & Klapka, 2020).

There are different fields of literature that provide the groundwork for answering my research question. I will present these fields in the following. Research gaps or open questions which result from reviewing and connecting these fields of the literature lead to the four papers of my dissertation. I will first present the psychological foundations of stress and coping in general and address the role of media use as a coping behavior. This literature field is the base

of my systematic literature review, presented in Paper 1, in which I develop a theoretical underpinning of where media can be placed in the coping process. Next, I will turn to the parenting context with a focus on parenting and parental stress. I will then focus on previous research on parental use of digital media on which Paper 2, a qualitative focus groups study, builds. In the following section, I will present relevant work from mobile communication and digital wellbeing research. This work serves as the base for Paper 3 of my dissertation in which I assess person-, device-, and situation-specific factors affecting maternal smartphone use for coping and coping effectiveness building on an experience sampling study. Lastly, I will briefly introduce a social constructivist viewpoint on media effects from which I assess the role of norms and guilt when mothers use their smartphones for coping with stress in Paper 4 of my dissertation.

In summary, the first paper of my dissertation provides the general theoretical base on which my following papers build. With a qualitative study, factors from the parenting context are added to this theoretical base. These theoretical considerations are then tested in a large quantitative experience sampling study, reported in Paper 3 and 4. In each paper, findings and learnings from the previous papers are combined with a different field of the literature which is particularly relevant for the respective research questions. A flowchart of the different papers of my dissertation can be found in Figure 1.

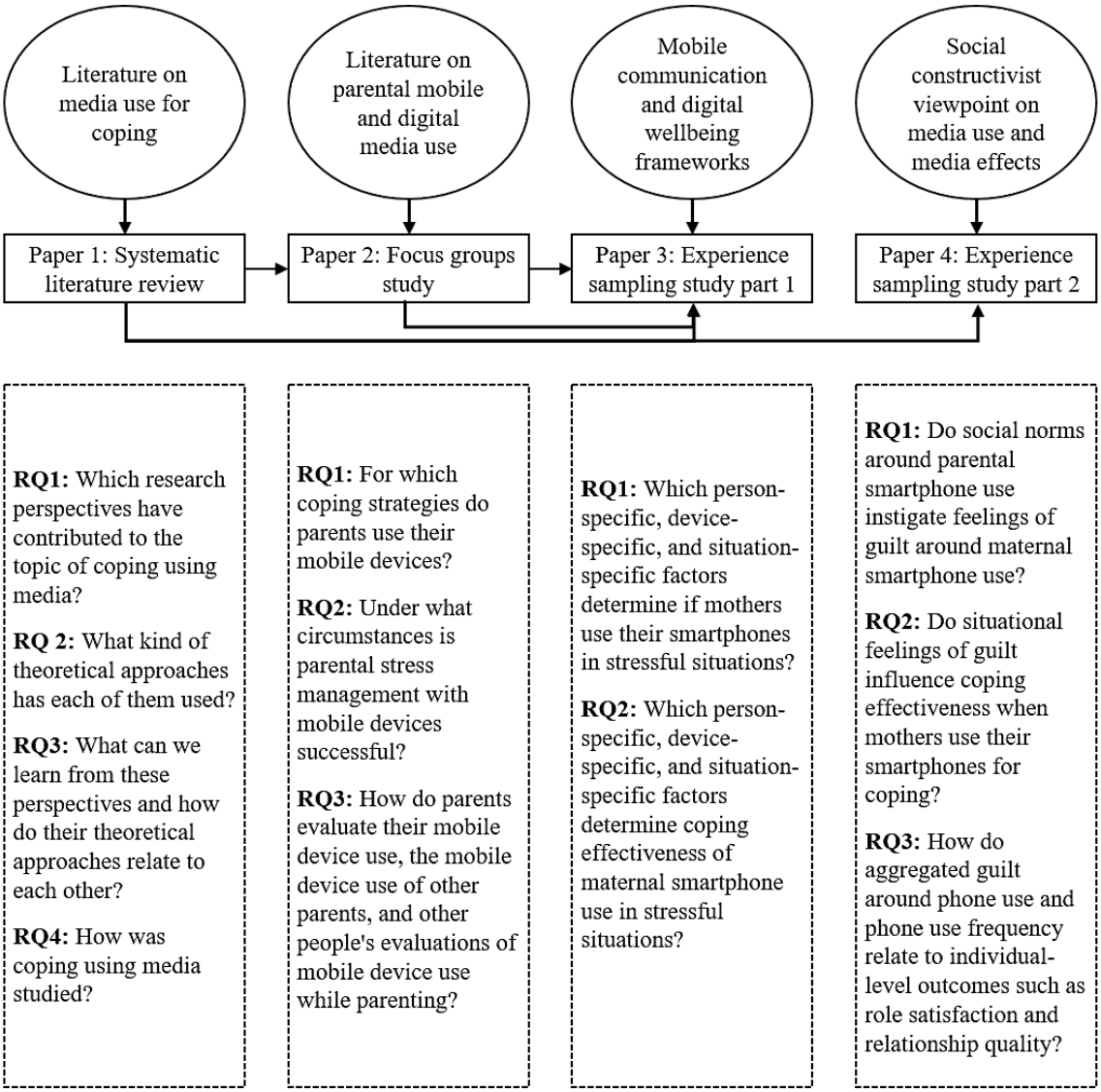
Stress and Coping

In the last 70 years, stress became a popular concept which is studied in a heterogeneous research field in many different disciplines (Lazarus, 1999; Robinson, 2018). In my dissertation, I will use a psychological perspective on stress. Within psychology, three main conceptualizations of stress can be distinguished, the stimulus perspective, the response perspective, and the transactional perspective (Lazarus, 1999; Monroe & Cummins, 2015). In the stimulus perspective, researchers posit that only objective characteristics of a "negative life event," such as a divorce or the death of a loved one, determine how much stress an individual experiences

when faced with this event (Holmes & Rahe, 1967; Monroe, 2008). As a second perspective, the response perspective has focused on the (primarily biological) mechanisms which follow experiencing stressful stimuli (Monroe, 2008). In this perspective, the definition of stress is solely based on the individual's reaction and does not include environmental characteristics (Lazarus, 1999). A third perspective brings the other perspectives together and sees stress as a transaction between stressful ecological stimuli and the individual's response (Lazarus, 1999; Monroe & Cummins, 2015).

Figure 1

Dissertation Flowchart



Building on this third perspective, Lazarus and Folkman (1984) have developed a transactional stress model. They define stress as an imbalance between the demands that are placed upon the individual and the resources available to the individual (Lazarus & Folkman, 1984). In the transactional model, the existence of such a situational disbalance is based on an individual's situational appraisal (Biggs et al., 2017). Appraising a situation is "the cognitive process through which meaning is ascribed to events/stimuli" (Biggs et al., 2017, p. 352). The transactional model differentiates between a first and a second appraisal (Lazarus, 1999; Lazarus & Folkman, 1987). In a first appraisal, an individual appraises if the situation is relevant enough to trigger a stress reaction and endanger wellbeing (Lazarus, 1999). Relevance is appraised based on one's core values, beliefs, or goals (Lazarus, 1999). If a situation is appraised as relevant for one's wellbeing, an individual further evaluates a stressful transaction as *harm or loss*, which refers to "damage that has already occurred" (Lazarus, 1999, p. 76), as a *threat* referring to potential damages, or as a *challenge* which involves a more optimistic focus on "overcoming obstacles" (Lazarus, 1990, p. 3). Second, an individual appraises which coping options are available and which might be helpful. This second appraisal serves as the "cognitive underpinning of coping" (Lazarus, 1999, p. 76), determining which coping options are used.

In the transactional model, coping is seen as a process involving all "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). Lazarus and Folkman (1984) differentiate between two primary functions of coping. Problem-focused coping aims at changing the stressful transaction, while emotion-focused coping focuses on altering the emotions aroused by the stressful transaction. This dichotomy has been widely criticized for the blurred distinction between both categories (Biggs et al., 2017; Skinner et al., 2003); however, it has also proven helpful to think in "broad brushstrokes" (Folkman & Moskowitz, 2004, pp. 751–752). All in all, researchers have not agreed on another

distinction such that nearly every research project uses a different classification of coping strategies (for a review, see Skinner et al., 2003).

In their transactional model, Lazarus and Folkman (1984) emphasize that the effectiveness of coping behaviors has to be evaluated in the context of a specific situation (see also Folkman & Moskowitz, 2004). Thus, while a coping behavior may be successful in one situation, it may not succeed in another (Lazarus, 1999). Therefore, the fit of the coping to the situation is the decisive factor for coping effectiveness (Folkman & Moskowitz, 2004; Lazarus & Folkman, 1984).

One can say that an individual has coped successfully or effectively if the emotions evoked by the stress have been regulated successfully and if the problem causing the stress has been solved (Tennen & Affleck, 2002). In some situations, however, solving a problem is outside of the individual's capability (e.g., certain illnesses). Moreover, a behavior might be successful in the short term but might cause problems or even more stress in the long term. Thus, "the issue of determining coping effectiveness remains one of the most perplexing in coping research" (Folkman & Moskowitz, 2004, p. 753).

The transactional model does not make explicit assumptions about which outcomes or indicators should be associated with effective coping. Coping effectiveness is, thus, depending on the research aim, defined differently and can be determined on different levels (Folkman & Moskowitz, 2004; Zeidner & Saklofske, 1996). Therefore, many outcomes have been researched, such as cortisol levels, perceived coping efficacy, wellbeing, or problem-solving (Folkman & Moskowitz, 2004). In my dissertation, I will focus on three overall outcomes: First, as done in previous research, I will use an individual's own appraisal of coping effectiveness as one important outcome (Aldwin & Revenson, 1987; Booth-Butterfield et al., 2007; Conway & Terry, 1992; Keefe et al., 1997). Second, I will use stress decrease as an indicator of successful coping (Cummings et al., 1994). Finally, successful coping aims at improving an individual's overall wellbeing, which is endangered by stressful situations (Lazarus & Folkman, 1984,

p. 181). I will, therefore, also look into broader outcomes of effective coping such as satisfaction with the mother role and parent-child relationship quality (Deater-Deckard, 2004).

Media Use for Coping

The question of what role smartphones or, more broadly, media in general play in the coping process is central to my research interest. Media use for coping was described and studied in communication science for a long time: Pearlin (1959), for example, examined how individuals faced with stress use television as a way of escaping their everyday "troubles" (p. 256). With the advent of smartphones, which made media available anywhere anytime, using media for coping might have become even more frequent (Vorderer et al., 2016). However, despite this long tradition and growing importance, research on media use for coping has been surprisingly unsystematic such that "some very basic questions about media use for coping with stress remain unanswered" (Nabi et al., 2017, p. 128). Among these unanswered questions, the place of media use within theories of stress and coping remains unclear (Nabi et al., 2017). Therefore, the first step of my dissertation involves a scoping review of the literature on media use for coping (Paper 1).

Scoping reviews follow a systematic search procedure similar to systematic reviews (Munn et al., 2018; M. Peters et al., 2015; Pham et al., 2014). However, they follow different aims and are suitable for a different state of research (Munn et al., 2018; Pham et al., 2014). While systematic reviews aim to answer a well-defined and specific research question, scoping reviews aim to map research concerning a broader and less clearly defined research topic (Arksey & O'Malley, 2005). Therefore, scoping reviews are "of particular use when the topic has not yet been extensively reviewed or is of a complex or heterogeneous nature" (Pham et al., 2014, p. 371). The field of media use for coping has not been systematically reviewed. Moreover, it is a heterogeneous field to which studies of different disciplines have contributed (Nabi et al., 2017). Thus, for the field of media use for coping, a scoping review can be of great value. Our literature review, presented in Paper 1, aims to systematize the research field on coping

using media, to identify and describe main theoretical perspectives on media use for coping, and to summarize what we can learn from each perspective. By relating the different research perspectives, we will contribute to the integration of this diverse field. Additionally, we will review the methods used to study how media are used for coping.

In the context of my dissertation, the scoping review provides the opportunity to situate media such as smartphones in the stress and coping process. In the further steps of my dissertation, I will apply this basic conceptualization to the parental context and to smartphone use.

Parenting and Parental Stress

Research focusing mainly on the stress parents experience in relation to parenting is growing in the last years (Louie et al., 2017). This research has demonstrated that increased parental stress is associated with harsher and more hostile parenting behaviors (McMahon & Meins, 2012; Venta et al., 2016) and child behavioral problems (Bakoula et al., 2009; Tharner et al., 2012; Ward & Lee, 2020). It is, thus, crucial that parents are able to cope successfully with the different stressors they face in their everyday lives (Deater-Deckard, 2004).

Parenting stress is defined as the stress directly related to the parenting role (Deater-Deckard, 1998, 2004). Several models focus on antecedents and consequences of parenting stress (Abidin, 1992; Crnic & Low, 2002; Deater-Deckard, 1998). Interestingly, these models prominently refer to the transactional stress model as their theoretical basis (Abidin, 1992; Deater-Deckard, 1998). The two main reasons for the broad application of the transactional model to the parenting context are the focus on appraisals and the emphasis on the situational transaction as the unit of analysis.

The transactional model focuses on appraisals emphasizing that the same circumstances can be stressful for one individual but might not be stressful for another individual (Folkman & Moskowitz, 2004). Research on parenting stress has shown that parents react differently to child behavior and potentially stressful circumstances (Deater-Deckard, 1998). For example, what is

seen as “problematic child behavior” that introduces stress on the parent’s side differs significantly between parents (Dix et al., 1989; Miragoli et al., 2018; Reid et al., 1987). Thus, focusing on parental appraisals of stressful situations compared to only concentrating on objective situational characteristics seems particularly appropriate for the parenting context (Abidin, 1992; Deater-Deckard, 1998).

Moreover, the focus of Lazarus and Folkman’s (1984) model on the stressful transaction including the individual’s environment also fits the parenting context well. When parents are the group of interest, it is almost always not only the individual on whom the research focuses, but research interests also refer to the individual’s environment as the environment includes the parent’s children (Crnic & Low, 2002). Thus, for parenting stress, the transactional model was seen as a fruitful model (Abidin, 1992; Deater-Deckard, 1998).

In my dissertation, my research interest goes beyond parenting stress. It has been shown that stress experienced in other life domains (e.g., work) can also influence the parental stress level and parenting behavior (Crnic & Low, 2002; Repetti & Wood, 1997). Moreover, the demands experienced in one situation might come from different life domains whose combination might then lead to a stressful imbalance of demands and resources in a particular situation. Therefore, in my dissertation, I will not only focus on parenting stress but – broader – on *parental stress*: I will focus on stressful situations that arise while parenting, including all stressors and without concentrating only on parenting stressors. I will thereby concentrate on stressful everyday life situations. These include mainly minor parenting stressors, parent’s “daily hassles” (Crnic & Greenberg, 1990), and to a smaller degree (because less frequent) also more major stressful life events. Thus, while acknowledging factors particular to the parenting role (e.g., the role of norms and guilt in the parenting context), I will use the transactional model as the groundwork and theoretical starting point of my dissertation.

After focusing on the theoretical basis on stress and coping, I will now turn to the media-based underpinnings of my dissertation, which I will build upon in addition to the theoretical approach to media use for coping developed in Paper 1.

Parental Use of Digital/Mobile Media

The field on parental use of smartphones for stress coping in everyday life is still small. Two studies focus at least in part on parental coping with stress using mobile devices in everyday situations (McDaniel & Radesky, 2018a; Radesky et al., 2016). Radesky et al. (2016) interviewed 35 caregivers about their perspectives on their smartphone use. One major theme which emerged in Radesky et al.'s analysis was "emotional tensions around technology" (p. 697) which involved stress-reducing as well as stress-inducing effects. Stress-reducing effects mainly consisted of descriptions of escapism: Parents, for example, described using video games to relax or texting with friends to remain in touch with their life outside their parenting role. They also reported receiving social support in online communities. As stress-inducing effects, parents described mainly information and role overload by receiving many messages which have to be answered while parenting. Radesky et al. (2016) conclude that "technology-based self-regulation may be an important tool for many stressed parents" (p. 699).

McDaniel and Radesky (2018a) conducted a longitudinal survey study with 183 mothers and fathers. They focused on the concept of technoference, the interference of technology into parent-child interactions, and looked at its association with parenting stress and child behavioral problems. In their study, greater parenting stress related to increased technoference two months later, from which the authors conclude that "parents use digital technology devices as a potential means of escape and for stress management" (p. 215).

While research on parental smartphone use for coping with stress in everyday life is, besides these two studies, still scarce, there are two areas of study that provide additional insights for my research question: Research on parental smartphone use *while* parenting and research on parental digital media use *for* parenting. Both research lines have studied the effects

of parental mobile and digital media use from different perspectives, but not much effort has been put into combining the insights of both perspectives.

Research on Phone Use While Parenting

Research on phone use *while* parenting has increased in recent years, leading to several review papers published in the last two years (Braune-Krickau et al., 2021; Hood et al., 2021; Knitter & Zemp, 2020; McDaniel, 2019). The current research landscape of parental phone use includes a range of studies employing observations in public places (Elias et al., 2020; Hiniker et al., 2015; Wolfers, Kitzmann, et al., 2020), experiments in the laboratory (Konrad et al., 2021; Reed et al., 2017), and survey research (McDaniel & Radesky, 2018a, 2018b; Meeus et al., 2021; Modecki et al., 2020).

All four recent literature reviews on parental phone use conclude that previous studies suggest negative influences of parental distraction from phone use on outcomes such as parent-child interactions, parental sensitivity, and child behaviors (Braune-Krickau et al., 2021; Hood et al., 2021; Knitter & Zemp, 2020; McDaniel, 2019). Judgments of how well previous research has supported negative influences of smartphones, however, differ between the reviews ranging from “minimal evidence” (Hood et al., 2021) to enough evidence to be considered “alarming” (McDaniel, 2019). The reviews consistently identify three significant gaps in previous studies: First, it is emphasized that there are still not enough studies on why parents use their phones and which content they use (Braune-Krickau et al., 2021; Hood et al., 2021; McDaniel, 2019). Second, the reviews criticize the research designs, which mainly incorporate cross-sectional studies and only a few experimental studies, making it hard to judge the causality of effects (Hood et al., 2021; Knitter & Zemp, 2020; McDaniel, 2019). Third, the reviews suggest that future research focuses more on the positive effects of parental phone use to paint a more differentiated picture of parental smartphone use effects (Braune-Krickau et al., 2021; Hood et al., 2021; Knitter & Zemp, 2020).

Research on Digital Media Use for Parenting

The second line of research that contributes to parental stress management using smartphones is the research on parental digital media use *for* parenting. Although this research does not focus on mobile device use, it can provide insights for some of the open questions raised by the reviews on parental smartphone use while parenting, especially to why parents use digital media and the positive effects of smartphone use.

Research on parental digital media use started in the late 1990s (Daneback & Plantin, 2008). First reviews on different subfields were already published more than ten years ago (Daneback & Plantin, 2008; Doty & Dworkin, 2014; Dworkin et al., 2013; Lupton et al., 2016; Nieuwboer et al., 2013; Plantin & Daneback, 2009). The main usage motives studied are parental information seeking online (e.g., Bernhardt & Felter, 2004; Jang et al., 2015) and social support seeking in online communities dedicated to parents (e.g., Doty & Dworkin, 2014; Drentea & Moren-Cross, 2005; Dunham et al., 1998). For social media, studies also focused on more passive use, such as following parenting influencers (Amaro et al., 2019; Coyne et al., 2017; Moujaes & Verrier, 2021).

Although also negative aspects and side-effects of parental Internet use for information seeking (i.e., difficulty to judge the reliability of information online, Bernhardt & Felter, 2004) and social support (i.e., competitive mothering, ideologized discourse, "mommy wars," Abetz & Moore, 2018; Bradshaw et al., 2021) have been described, parents overall evaluate resources provided online as valuable and helpful (Doty & Dworkin, 2014; Dworkin et al., 2013; Lupton et al., 2016). In a focus groups study, Lupton (2017), for example, found that online communities were important for parents because they could discuss sensitive topics and questions they had (e.g., about sexual activity) anonymously. Parents also described that the immediate access to support and information from other parents was helpful (Lupton, 2017). As a result of a qualitative content analysis of the online community of an Irish parenting website, Brady and Guerin (2010) conclude that online communities were a place on which parents could share

their negative experiences, such as the feeling of being a bad mother. In addition, quantitative data of the Pew research center show that nearly three-fourth of parents report finding social support from friends and family on social media; Almost two-thirds have come across helpful parenting information on social media in the last thirty days (Duggan et al., 2015).

Most research on parental digital media use does not focus on stress and coping. Still, a few studies concentrating on parental digital media use when parents face particularly challenging circumstances employ a stress and coping perspective (Basinger & Knobloch, 2017; Baum, 2004; DeHoff et al., 2016; Mazur & Mickle, 2018). These studies similarly confirm the primary uses of information and social support seeking when confronted with stressful events such as having a child with special health care needs (e.g., DeHoff et al., 2016). Similarly, the studies emphasize the stress-reducing potential of parental digital media use (Basinger & Knobloch, 2017; Baum, 2004; DeHoff et al., 2016). Most of the studies using stress and coping perspectives focus on parents challenged with special circumstances as seriously ill children. Still, these studies' results align with the findings of not coping-focused studies that focus on broader samples and everyday life situations (see above).

Summary and Implications for my Dissertation

From this literature overview, one can conclude that parents seem to use their smartphones for stress management. While the literature on parental digital media use suggests that parents seek mainly information and social support, the qualitative interview study of Radesky et al. (2016) suggested escapism or distraction as a third important coping strategy for which parents use their phones. Moreover, the research line on digital media use contributes that parents overall perceive online resources as a helpful and valuable addition to their offline resources.

However, significant research gaps remain. First, most studies do not employ a stress and coping perspective. Second, research focusing directly on smartphone use while parenting has not provided much insight into why parents use their phones and into potentially positive

effects of parental smartphone use. Thus, an in-depth analysis of for which coping strategies parents use their smartphones in stressful situations is still missing. Third, there is still very little research and knowledge about which factors influence the coping effectiveness of smartphones. Thus, in the second paper of my dissertation (Paper 2), I report the results of a focus groups study I conducted with parents of young children.

Focus group interviews are a qualitative method particularly suited for deep exploration of complex, yet under-researched, everyday behaviors and related motivations and discussions (Lunt & Livingstone, 1996; Morgan, 1996). For conducting focus groups, researchers bring "together a group, or, more often, a series of groups, of subjects to discuss an issue in the presence of a moderator" (Lunt & Livingstone, 1996, p. 80). Focus groups discussions offer several advantages, especially for research on understudied topics. First, focus groups afford that group members bring up and discuss new and interesting aspects and processes (Morgan, 1996). Second, focus groups make it possible to simulate everyday discussions surrounding media use, so researchers can study the social context in which smartphone use takes place in addition to individual usage experiences and perceptions (Lunt & Livingstone, 1996). Third, within group discussions, dynamics between participants and their unique experiences can occur, which are interesting contexts to study how participants use media and what kind of meaning they ascribe to their devices. As Lunt and Livingstone (1996) put it: "The group acts as a context that challenges, asks for elaboration, and demands examples of claims that people make" (p. 93).

These advantages make focus groups a suitable method to explore how parents experience their own smartphone use in stressful situations. By employing this method, I can not only compare different descriptions of parent's smartphone use for stress management but also better comprehend which evaluations participants make when they talk about parental smartphone use in everyday discussions. I will therefore use this method to get first insights into the coping strategies for which parents use their mobile devices, to investigate under which circumstances

parental stress management with mobile devices is effective, and investigate how parents perceive their own as well as other parents' mobile device[1] use. In the next step, I will then build on the insights from the focus groups study in a large quantitative experience sampling study. The experience sampling study additionally focuses more on the smartphone as a medium with unique characteristics. I will introduce and describe these characteristics in the following.

Smartphones as Omnipresent Metamedia

There are two aspects of smartphones that might be the most prominent when distinguishing them from other media: Smartphones are metamedia which can be used for a wide range of activities (Fortunati & Taipale, 2014). Additionally, smartphones are – as portable devices – omnipresent in many of today's societies and are thus used in very different situational settings (Campbell et al., 2016; Vorderer, 2015). Hence, both smartphone use itself and the circumstances of smartphone use can be considered diverse.

In my dissertation, I ask how and under what circumstances mothers use their smartphones for coping with stress and under which circumstances their smartphone use for coping is effective. The area of literature that can help to examine the diverse circumstances of smartphone use in more detail and provide insight into how to classify and theorize such circumstances is the field of mobile communication and (digital) wellbeing (Kushlev & Leitao, 2020; Vorderer et al., 2016). Vanden Abeele (2020) defines digital wellbeing as "a subjective individual experience of optimal balance between the benefits and drawbacks obtained from mobile connectivity" (Vanden Abeele, 2020, p. 7). At least part of the overall research question of my dissertation can be seen as a problem of digital wellbeing because the question is if and how mothers can achieve the "optimal balance between benefits and drawbacks obtained from mobile connectivity" in stressful situations while being with their children.

[1] In the focus groups study, I asked parents more broader about mobile devices. Only once the use of a mobile device other than a smartphone was described. I focused on smartphones in the experience sampling study.

The literature on mobile media use and (digital) wellbeing is still characterized through a high diversity in theoretical approaches and concepts (or, as Ross & Campbell, 2021, p. 148, put it, research is still "disjointed"). The concept of stress has played an important role (Vahedi & Saiphoo, 2018); however, smartphones have mainly been studied as a cause of stress and not as an instrument for coping (Freytag et al., 2021; Steele et al., 2020; Wolfers, Festl, & Utz, 2020). My research belongs to the larger field of research on digital wellbeing but addresses the more concrete issue of coping using smartphones that has received less attention (Hoffner & Lee, 2015). Thus, I will not review the entire field of research here (for recent reviews, see Ross & Campbell, 2021 and Kushlev & Leitao, 2020). However, conceptualizations from this field can be fruitfully used to identify and systematize factors that impact smartphone use and smartphone use effects. For my dissertation and, in particular, for Paper 3, I will build upon Humphreys et al.'s (2018) metamedia framework and Vanden Abeele's (2020) digital wellbeing framework. I will shortly introduce their frameworks and, in particular, their systematizations of factors that affect smartphone use and smartphone use effects in the following.

Smartphones as Metamedia

According to Humphreys et al. (2018), smartphones are metamedia; they incorporate a broad range of previously separate media technologies such as TV, fitness trackers, or newspapers (Fortunati & Taipale, 2014; Humphreys et al., 2018). Building on the framework of Humphreys et al. (2018), these separate media incorporated in a smartphone can be called constituent media. Within a metamedium as the smartphone, constituent media (e.g., Facebook app, banking app, camera) are not used independently but often in conjunction (e.g., receiving a mail with a bill and directly paying it via the banking app) and should therefore be seen as interconnected (Humphreys et al., 2018). Metamedia are thus more than the sum of its unique parts (Madianou, 2014, 2020). Applied to my context, also mothers who use their smartphone for coping might sometimes use one constituent media (e.g., seek information on a website with information about a child's illness) and at other times use several constituent media separately

(e.g., also ask fellow parents if their children had a certain symptom) or in combination (e.g., ask friends if a certain piece of information they found on a website is correct).

Humphreys et al. (2018) differentiate between three different levels, which determine what a smartphone enables an individual to do in a given situation.[2] The first level is the *metamedium* itself with its various constituent media and their interconnected features. As phones are different from user to user, the perceived features of a particular device depend on the individual's configuration. Thus, how mothers can use their smartphone in a stressful situation is determined, for example, by which apps they have installed. Moreover, external actors such as programmers integrating functions or friends who post something on Facebook influence the features a particular device incorporates in a given moment. As a second level, an individual uses the device with certain *expectations and perceptions*: While or before using, users seek gratifications such as looking for information or social support to cope with stress. These sought gratifications shape how an individual uses their device. As a third level, Humphreys et al. (2018) conceptualize *situational factors*. Situational factors, such as having to care for children while using a device or being in a stressful situation, influence which gratifications a user seeks but also which gratification opportunities an individual perceives to have. Gratification opportunities are "perceived content, time, and space attributes of a medium" (Dimmick et al., 2004, p. 23). For example, calling somebody to receive social support might be a gratification opportunity that is only available to a mother during the daytime and if the phone is not out of range. Moreover, gratification opportunities only exist if the user perceives to have this opportunity (Humphreys et al., 2018). Thus, the three levels which influence smartphone uses in a particular situation are interconnected and influence each other (Humphreys et al., 2018).

[2] Humphreys et al. (2018) use the affordances concept which they define as latent constructs influenced by the three level (uses of the individual, device characteristics, and situational context). To stay focused and following Vanden Abeele (2020), I will not introduce the affordance concept here.

Omnipresent Smartphones and Digital Wellbeing

The situational context is similarly emphasized by Vanden Abeele (2020) in her digital wellbeing conceptualization. Vanden Abeele (2020) refers to the ubiquity of smartphones and the challenges users face in dealing with constant mobile connectivity. In her conceptualization, digital wellbeing is obtained if the benefits and drawbacks of mobile connectivity are optimally balanced. Digital wellbeing is produced in interaction with "affective and cognitive states" (Vanden Abeele, 2020, p. 8). Stress is such a state and therefore has a direct anchor point in Vanden Abeele's (2020) model: Being in a stressful situation influences how digital wellbeing is achieved (e.g., stress might drive people to use their smartphones).

According to Vanden Abeele (2020), three levels of factors with stable and momentary parts influence if digital wellbeing is achieved*: Person-specific factors* include stable personality traits and the aforementioned affective and cognitive states, including stress. Mothers with good self-regulation skills might achieve digital well-being, for example, more easily. *Device-specific factors* include the configuration of the device, which is based on user choices together with factors determined by programmers and other external actors. As a helpful distinction, Vanden Abeele (2020) distinguishes between more *stable* characteristics of the device as installed apps and *momentary* characteristics such as notifications. Although she does not name this specifically, I will also understand the used content (e.g., news stories, social media posts) with its characteristics, such as the valence of the accessed content, as a momentary device-specific factor. Again, the content used can be seen as an interplay between choices by the individual user (e.g., to open a particular app) and choices or actions of external actors (e.g., the content of a parenting website). As a third level, Vanden Abeele (2020) names *context-specific factors,* which she distinguishes likewise in more stable and more momentary factors. Stable context-specific factors include, for example, the culture, which will not be the focus of my dissertation. Momentary context-specific factors, for example, impact the social roles and the associated obligations salient in a specific situational context, such as being in the parenting

role (Vanden Abeele, 2020). In my dissertation, I will refer to momentary context-specific factors as situational or situation-specific factors.

Vanden Abeele (2020) conceptualizes that these three levels of factors form a dynamic system together with digital media use and digital wellbeing. In this system, each factor is not an independent entity, but all factors interact with each other, which brings the question to the focus: "how persons, devices and contexts interact" (p. 8) in influencing digital wellbeing.

Both conceptualizations share similarities in the levels they conceptualize and in their assumption that smartphone use is determined by a dynamic system that involves changing characteristics and conditions at all three levels. However, the conceptualizations complement each other in that Humphreys et al. (2018) focus more on the smartphone use itself while Vanden Abeele (2020) focuses more on phone use effects. Besides, both conceptualizations contribute certain unique facets and observations, such as the differentiation between momentary and stable factors of Vanden Abeele (2020) or the focus on the situational perception of gratification opportunities of Humphreys et al. (2018).

Summary and Implications for my Dissertation

Both conceptualizations fit my research aim very well and thus help structure thinking about the phenomenon I want to research. The emphasis of the situational factors, which are immanent to both works, fits the situational focus on stressful situations, which the transactional model similarly emphasizes. Humphreys et al. (2018) and Vanden Abeele (2020) also highlight the many gratifications which can be obtained via smartphone use which fit several coping strategies (e.g., social support, information seeking). Humphreys et al. (2018) underline that gratification opportunities should not be attributed to the device alone but that the individual's *perception* also plays a central role in determining if a specific gratification opportunity exists in a particular moment. This view aligns with the appraisal-centered perspective of the transactional model. Beyond these similarities with the transactional model, the major contribution of

both conceptualizations for my research aim is their classification of factors that help to structure circumstances that might impact maternal smartphone use in stressful situations and the coping effectiveness of such smartphone use. I adopt the classification into person-specific, device-specific, and situation-specific factors and the distinction of momentary and stable factors. Building on this distinction, I will investigate in my Paper 3 what person-specific, device-specific, and situation-specific factors impact whether mothers use their smartphones in stressful situations and whether their smartphone use for coping is successful.

The Experience Sampling Method as Suitable Research Design

Answering this research question requires a research design that allows for the differentiation of all three levels. Humphreys et al. (2018) and Vanden Abeele (2020) suggest experience sampling as a suitable method to test their models. The experience sampling method (ESM) is "characterized by: (1) *repeated assessments* of (2) *current or very recent* states, (3) in the context of individual participants' *natural environments*" (Hajal et al., 2019, p. 113). The ESM is increasingly conducted via mobile phones, then called mobile experience sampling method (MESM, Karnowski, 2013). In the original ESM design by scientists of the University of Chicago (Csikszentmihalyi & Larson, 1987), participants received several signals at random time points during a day and answered questions about their immediate experience (Kubey et al., 1996; Masur, 2018; Schnauber-Stockmann & Karnowski, 2020). In their recent scoping review about MESM studies conducted in communication science, Schnauber-Stockmann and Karnowski (2020) also include slightly modified methods under the term MESM, in which signals are not sent randomly but at fixed time points and events that have recently taken place (compared to currently happening) are reported. These designs are called "quasi-experience sampling method" (Schnauber-Stockmann & Karnowski, 2020).

Also in stress and coping research, the ESM is often recommended, although it is less often applied (Duvenage et al., 2019). The ESM has several advantages, which make it a suitable design for assessing how mothers use their mobile devices in their everyday life for coping with stress and under what circumstances smartphone use for coping is effective.

First, the ESM affords to measure the situational context in which an experience occurred, including, for example, who was there or where an event took place (Kubey et al., 1996; Scollon et al., 2003). The importance of situational factors for my research question stems from both the transactional model and the metamedia and digital wellbeing frameworks. For my research aim, measuring situational circumstances is thus of unique importance, making ESM a great method for data collection.

Second, asking participants about an experience that just happened reduces recall bias considerably (Karnowski, 2013; Masur, 2018). Smartphone use is highly habitual and thus is not easily remembered (Parry et al., 2021). Moreover, the content accessed via a smartphone is different each time it is used and due to the short usage times, the content might be particularly hard to remember (Oulasvirta et al., 2012). Thus, perceived momentary device-specific factors are probably hard to assess with a larger time-lag between use and report.

Third, the measurement is done directly in the participants' everyday lives resulting in a high ecological validity (Duvenage et al., 2019; Masur, 2018; Scollon et al., 2003). As my research aims to assess maternal phone use for coping in everyday life when they are with their children, this advantage is crucial for my research question.

Fourth, the ESM method does not require situational selection or aggregation by the participant (Conner & Barrett, 2012). When participants are asked how they usually cope with specific stressors, they have to form some kind of aggregate of situations in which they had dealt with the stressors. This aggregate will likely reflect important situations disproportionately (Duvenage et al., 2019). Using experience sampling is hence a suitable method to investigate less important but frequently happening stressful situations in everyday life. These so-

called daily hassles contribute greatly to the stress parents experience (Crnic & Greenberg, 1990) and are thus the main interest of my dissertation.

As the last point, the ESM compared to observational research allows measuring appraisals made by the individual, which are the core focus of the transactional model (Lazarus & Folkman, 1984) and which are also decisive for the use of smartphones (Humphreys et al., 2018).

Besides these points suggesting that experience sampling is a suitable method for my research question, this method, of course, also comes with drawbacks. First, the ESM is highly effortful for participants as they have to answer a large number of questionnaires (Duvenage et al., 2019; Karnowski, 2013). However, given the time-space constraints mothers face (Barclay et al., 1997; Frantál & Klapka, 2020), answering several short questionnaires compared to having to find a longer period of time for longer questionnaires might also come with advantages for mothers of young children. Still, participating in an experience sampling study affords time and effort, leading, as a second drawback, to biased self-selection of participants (Scollon et al., 2003). Third, on the level of the situation selection, biased selection of situations might also be problematic as experiencing particularly stressful situations might result in skipping an experience questionnaire (Duvenage et al., 2019). Lastly, intensive studies, which require answering many questions about a certain experience, might lead to reactivity, that is, the change in the studied experience through the study itself (Scollon et al., 2003; Stone et al., 2003).

Besides these disadvantages, due to the many advantages and the fit to my research aims, the final study of my dissertation will consist of an experience sampling study. In this study, I will ask mothers of young children about stressful situations which occurred in the last two hours. Most importantly, I will ask how mothers perceived the stressful situation, whether they used their smartphones, and whether their coping was successful. In this larger study, I explore two different topics, which result in the last two papers of my dissertation. As outlined above, I investigated in the third paper, building on the frameworks of Humphreys et al. (2018)

and Vanden Abeele (2020), which person-specific, device-specific, and situation-specific factors influence if parents use their device in stressful situations and if these different factors influence whether coping using smartphones is effective. The factors I will investigate build on the results of the literature review in the first paper and the focus groups study supplemented by factors commonly studied in stress research and in research on smartphone use and digital wellbeing. This, to my knowledge, first experience sampling study with mothers about their smartphone use allows me to answer my research question by capturing the circumstances of maternal smartphone use in stressful situations in great detail, with high ecological validity, and few recall problems.

Additionally, I will take a closer look at the parental perception and feelings around their smartphone use, which will be the focus of Paper 4. I will place these perceptions within a social constructivist view on media which I will introduce in the following.

A Social Constructivist Viewpoint on Media Effects

The basic idea of social constructivism is that our social reality does not (only) consist of objectively observable facts, but that we construct (parts of) our social reality ourselves (Hepp et al., 2017; Lindlof, 2008). Moreover, the *social* in social constructivism highlights that this construction of reality is not an individual process but occurs collaboratively through communication between members of a society (Leeds-Hurwitz, 2016). Together, the members of a society make sense of our social world and construct an "intersubjective common-sense world" (Berger & Luckmann, 1991, p. 34). This collaborative construction is passed on over generations through socialization and is always historically conditioned (Couldry & Hepp, 2017). Consequently, we do not perceive our construction of reality in everyday life as such, but experience our construction as "taken-for-granted" (Berger & Luckmann, 1991, p. 34); as Couldry and Hepp (2017) put it: "Through the variety of our sense-making practices, we construct our social world, as something 'common' to us from the beginning" (p. 18).

The founding and most influential work of social constructivism is the book "The social

construction of reality" by the sociologists Peter Berger and Thomas Luckmann (Berger & Luckmann, 1991; Leeds-Hurwitz, 2016). One of their contributions to the field was to separate the questions of how we construct our everyday social world from the fundamental philosophical question of whether there is such a thing as an objective reality at all. Following this separation, I am also not concerned in my dissertation with the question of whether reality, i.e., "objective media use," exists at all. Rather, the central point I am making building on a social constructivist perspective is that media use not only has objective properties but is also *subjectively perceived and socially constructed*. I argue that this constructed perception of one's own media use is an essential but neglected facet in current media effects research. I will outline this in the following.

Lindlof (2008) describes five fields within communication science that have used constructivist approaches: mass communication, media audience research, interpersonal communication, intercultural communication, and technology research. I will build on and extend the latter field. The distinctive characteristic of applying constructivist ideas in this field of communication science is that the focus is not on how media construct reality (for this, see e.g., Couldry & Hepp, 2017). Rather, the central question is how perceptions of media technologies themselves are socially constructed.

The social influence model of technology use

The central model on the social construction of media technologies is Fulk et al.'s (1990) social influence model of technology use (Lindlof, 2008). As the model name already acknowledges, Fulk et al.'s (1990) model explains how an individual's social relationships shape the individual's media use. Fulk et al.'s (1990) basic assumption is that media use is strongly influenced by media *perceptions and attitudes*. Media perceptions and attitudes are influenced by a technology's objective features (e.g., color, the possibility for synchronous communication), prior experience and skills (e.g., prior usage behavior), and social influence

(e.g., what friends say about a technology) and are thus "in part, *subjective and socially constructed*" (Fulk et al., 1990, p. 121, emphasis in original). Such social influence can happen via direct communication, social learning, group norms, and social definitions of rationality (socially accepted reasons for a behavior, Fulk et al., 1990).

Additionally to the media perceptions and attitudes, media use is influenced by the tasks which shall be fulfilled by the media use (Fulk et al., 1990). As these tasks are tied to the organizational context in which Fulk et al. (1990) developed their model, I will not outline this part of the model here. Overall, the "task" when parents use their smartphones in stressful situations is considered in my dissertation as coping. In a broader sense, media gratifications can be modeled as such tasks and thus explained by Fulk's model (see the applications to non-organizational contexts as mobile phone adoption, see Campbell, 2007; Campbell & Kelley, 2008; Campbell & Russo, 2003).

A social constructivist viewpoint on media use and media effects

In the social influence model of technology use, the dependent variable of interest is media use. Research drawing from this model has accordingly mostly investigated how technologies are used and adopted (Campbell & Russo, 2003; Fulk et al., 1995; Schmitz & Fulk, 1991). However, in addition to being an outcome of media evaluations, Fulk et al. (1990) also conceptualize media use as (re-)influencing media evaluations. They write: "sense-making may well be created *after* the occurrence of the behavior [i.e., media use]" (p. 123, emphasis in original). This means that not only the perception of the media technology is subject to sense-making and social influence but also the media *use*. It thus makes intuitive sense that the *perception of media use* and also *media effects* are accordingly not only influenced by objective characteristics of use (e.g., usage time) but that they are also subject to social influence.

In fact, in two studies, Reinecke and colleagues (2014, 2016) support that media use perceptions impact media effects. In a survey study, participants who perceived their entertainment use the day before as procrastination felt more guilt and experienced, in turn, less media-

induced recovery (Reinecke et al., 2014). Similarly, in an experience sampling study on media use and wellbeing, Reinecke and Hofmann (2016) found that perceiving media use as a form of procrastination leads to a negative situational self-evaluation (“guilty,” “incompetent,” “unproductive“), which was in turn related to less situational wellbeing. On the contrary, perceiving media use as a form of recovery was related to more media enjoyment which was in turn associated with more situational wellbeing (Reinecke & Hofmann, 2016). Both studies, therefore, confirm that how media use is perceived impacts media use's effects on wellbeing.

As a second step, the question remains whether such media use perceptions are subject to social influence. Studies on the social influence model of technology use suggest this (Campbell, 2007; Campbell & Russo, 2003). In a survey study, Campbell (2007), for example, found that the perception of talking on the phone in different locations (e.g., in the restaurant or on the bus) varies between participants from different countries. Taiwanese participants, for example, perceived mobile phone use in restaurants as more appropriate than participants from the USA and Sweden (Campbell, 2007). This finding shows that their respective country’s social norms influenced whether participants perceived a specific media use as appropriate or not appropriate.

Overall, these studies suggest that social influence not only impacts how media technologies are perceived but also how media *use* is perceived. Moreover, results demonstrate that perceptions of media use influence media effects such as wellbeing.

Why is this important for answering whether mothers use their smartphones for coping and under which circumstances this use is effective? First, the social influence model of technology use adds that the social surroundings, including norms around smartphone use, might be important predictors for smartphone use. Secondly, it also contributes the assumption that coping effectiveness might not only be determined by objectively observable smartphone use features (e.g., phone use/non-use) but also by how the parent perceives their smartphone use.

In fact, the parenting context is one that may be particularly prone to social influences.

Parenthood and, to an even greater extent, motherhood is a part of everyday life which is "morally charged" (Ribbens McCarthy et al., 2000, p. 786) and defined by strong social norms (May, 2008; Miller & Brown, 2005; Shirani et al., 2012). Several authors argued that in the last decades, parents and in particular mothers were seen as increasingly responsible for the wellbeing of their children while at the same time their competence has been questioned, making especially mothers susceptible to social pressure (e.g., expert advice, values of others, Fox, 2009; Shirani et al., 2012). Therefore, in a motherhood context, social influence seems to be particularly important to consider also for examining their smartphone use. Thus, in Paper 4, I investigate how social norms and feelings of guilt surrounding smartphone use impact how parents use their phones for coping and whether their coping using phones is effective.

I will investigate this question with the experience sampling study already introduced before. Also, for assessing feelings of guilt, experience sampling has been suggested as an appropriate method to capture this feeling in real-life situations (Parkinson & Manstead, 1993). Accordingly, several studies have successfully used ESM to measure feelings of guilt (Baumeister et al., 1995; Berg et al., 2013; Reinecke & Hofmann, 2016).

After I introduced the different theories, literature fields, and conceptualizations on which my dissertation builds, I will give a short summarizing overview over the four papers of my dissertation in the following.

A short guide through the papers

My dissertation builds on several literature fields, which I have introduced in the previous sections. Each of these literature fields contributes unique perspectives to my research topic and is a starting point for the different papers of my dissertation. Besides building on different parts of the literature, the papers of my dissertation also build on each other (see also Figure 1). The overall research question I want to answer with my dissertation is how mothers use their smartphones to cope with stress and under what circumstances their stress management using mobile devices is successful. In four papers, I will address different facets of this question.

In the first paper, I begin with a presentation of a systematic scoping review in which Dr. Frank Schneider and I will review, summarize and critique the different approaches which were used to study media use for coping. Using a thorough search term, we will search relevant literature databases and identify and code articles that studied how media are used for coping with stress. More specifically, we will describe the different research perspectives that have contributed to the topic of coping using media (RQ1), summarize the theoretical approaches each of these perspectives has used (RQ2), and highlight and relate key learnings from each perspective (RQ3). We will formulate advancements for this field, including a suggestion where media can be placed in the transactional model of stress and coping. We will also shortly summarize the methods which were used to study media use for coping (RQ4). Overall, the first paper will provide theoretical groundwork for the following papers of my dissertation.

In my second paper, integrating the two fields of literature on how parents use mobile and digital media for and while parenting, I will take a first, in-depth look into the parenting context and assess how mothers evaluate their phone use for coping with stress. I will present the results of a focus groups study in which I explore for which coping strategies mothers use their mobile devices (RQ1) and under what circumstances their stress management with mobile devices is successful (RQ2). Moreover, I will investigate how parents evaluate their own mobile device use and the device use of other parents and assess how parents perceive that observers evaluate parents if they use their device (RQ3). I will interview two samples of mothers recruited in two different contexts. I will conduct one set of interviews with a convenience sample in Tübingen and another set of interviews with patients in a parent-child health retreat clinic. I will answer my research questions using a qualitative content analysis of the interview transcripts.

In the third and the fourth paper of my dissertation, I will describe the results of a preregistered experience sampling study with mothers of young children. Again, both papers build

on the advancements formulated in the first paper and build on several factors and themes that emerged from the focus groups study.

The third paper will additionally draw from the literature on mobile communication and digital wellbeing. With the experience sampling study, I will shed light on the different person-specific, device-specific, and situation-specific factors that might impact whether mothers use their smartphones for coping (RQ1) and whether this use is effective (RQ2). To investigate the research questions assessed in this paper, mothers will answer questions about personality traits, stable and momentary device-specific factors, and situation-specific factors and report on their smartphone use, experienced stress, and perceived coping effectiveness. Mothers will be asked to answer a presurvey and four short daily questionnaires each day over the course of one week.

The fourth paper is based on the social constructivist perspective presented in the last part of the introduction. It will focus on norms and feelings of guilt around maternal smartphone use. Specifically, I will investigate whether and how social norms around parental smartphone use instigate situational feelings of guilt around smartphone use (RQ1). Moreover, I will assess whether situational feelings of guilt influence coping effectiveness when mothers use their smartphones for coping with stress (RQ2). Mothers will be asked to report on guilt and coping effectiveness in the situational experience sampling questionnaires and on social norms around parental smartphone use in the presurvey. Building on the postsurvey, I will in this paper also look into the more long-term effects of situational guilt and maternal phone use and investigate the impact of guilt around phone use and frequency of maternal phone use on satisfaction with the mother role and parent-child relationship quality (RQ3).

This dissertation will end with a general discussion in which I bring together the findings and contributions of the four different papers. Besides, I will formulate specific implications for theory and research and for parents and politicians or health practitioners who aim to advise parents on their phone use. After providing a detailed analysis of my dissertation's limitations and strengths, I will conclude with a general outlook.

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PAPER 1

Using Media for Coping: A Scoping Review

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Supplemental Material

Supplemental material for this article is available online (Online Appendices A, B, and C) and through OSF (https://osf.io/s3b5z/).

Abstract

Mobile phones, television, Internet services, games, and social media offer diverse and numerous opportunities for coping with stress in everyday life. Different disciplines have contributed to answering how these media are used for coping. Consequently, fragmented and disconnected research perspectives have evolved. To improve integration, we conducted a scoping review. A total of 318 articles met the inclusion criteria. Three main perspectives on media use for coping were identified: (1) stress and coping, (2) mood management and emotion regulation, and (3) media addiction and problematic media use. Each perspective has contributed to different aspects of the use of media for coping. Six advancements are proposed, which attempt to integrate perspectives and to guide future research on coping using media.

Using Media for Coping: A Scoping Review

Currently, there is an ongoing debate among communication scholars concerning the mediatization of everyday life and how it might increase experienced stress, considering that it has led to phenomena like a growing "fear of missing out," technostress, information overload, and permanent communication pressure (e.g., Halfmann & Rieger, 2019; Reinecke et al., 2017; Van der Schuur et al., 2019). However, contrary to frequent discussions, in addition to *causing* stress, media can be easily used for coping with stress in everyday life. In our media-saturated world, media use for *coping* might have become even more prevalent (Nabi et al., 2017). Social network sites, for instance, can be used for receiving social support (Frison & Eggermont, 2015), computer games can be used to recover from daily hassles (Reinecke, 2009), TV shows can be used to escape from stressful life events (Anderson et al., 1996), and blogs and health websites can be used for information seeking and problem solving (Chung & Kim, 2008). The diffusion of smartphones further enhanced access to these services (e.g., Hoffner & Lee, 2015; Schneider, Rieger, et al., 2018), especially for coping in everyday life.

Studying stress—and especially coping—is an important aim as there is probably no society that does not produce stress among its members (Pearlin, 1959). From an evolutionary perspective, stress is nothing negative per se as it can cause adaption to the environment and enhance fitness (Bijlsma & Loeschcke, 2005). However, if we experience stress more often over a period of time and, more importantly, if stress is not coped with effectively, it can have severe consequences for health and wellbeing (e.g., a negative impact on the immune system, Herbert & Cohen, 1993, or on fertility, Louis et al., 2011).

Thus, it is certainly a severe problem if research has not yet been able to shed light on the use of media for coping such that "some very basic questions about media use for coping with stress remain unanswered" (Nabi et al., 2017, p. 128), although "[i]t is desirable to fill the gaps in the existing evidence about such basic connections between people's everyday lives and their relying on the media for dealing with everyday strains" (Knobloch-Westerwick

et al., 2009, p. 266). However, when searching for literature on coping using media, we found that there is quite a lot of research on this topic (hence, the high number of articles—318—in our final sample that discussed this topic). The problem, therefore, seems to be not a lack of research but rather that the emerging research about coping with stress by using media has evolved in various research areas that have contributed to different aspects of this topic but have mostly neglected each other. To date, no review has captured these different research areas and, consequently, there has been no attempt to integrate conceptual approaches and to compare and relate findings.

With a scoping review of the current body of literature on coping through media use, our general goal is to map the field and synthesize different approaches. More specifically, we aim at (1) describing which research areas have contributed through what kind of lenses to the topic of coping through media use, (2) providing a condensed overview of the previous research and its problems so far, and (3) relating and integrating approaches. As the field has not been comprehensively reviewed yet and appears broad, complex, and fragmented, a scoping review seems more appropriate than a more focused systematic review (for details on terminology, see Munn et al., 2018; Peters et al., 2015). As we are interested in how media use is connected to ways of coping with stress and not in how media causes stress when used for other purposes, we focus on coping *through* media use and not on media as *stressors*.

We start by introducing the basic conceptualizations of stress and the coping processes as described in the transactional model of stress and coping by Lazarus and Folkman (1984). Next, we briefly explain differences and overlaps between stress management and related concepts, such as mood management and emotion regulation, before describing the method of our scoping review. In the Results section, we focus on the theoretical conceptualizations used in the different research areas and attempt to integrate the different approaches by proposing six advancements. We conclude by shedding light on the implications of our findings for the three identified research areas.

Theoretical Foundation

The transactional stress model by Lazarus and Folkman (1984) has most widely influenced stress and coping research and, thus, serves as our theoretical basis. According to this model, stress "is a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). Accordingly, stress and coping can only be understood when looking at the transaction between person and situation. In a first appraisal, individuals interpret environmental stimuli. If those stimuli are evaluated as threatening, challenging, or harmful, the individual analyzes whether personal resources are sufficient or not. If not, the individual perceives stress, evaluates coping options in a second appraisal, and implements one or more of those options. Coping is defined as the cognitive and behavioral efforts that are undertaken to manage the stressful person-environment transaction (Lazarus & Folkman, 1984). Lazarus and Folkman (1984) differentiated between two superordinate ways of coping. Problem-focused coping includes the attempts to alter the stressful person-situation transactions including, for example, the search for further information. Emotion-focused coping is directed at the emotion evoked by the stressful situation rather than directed to the stress-evoking problem itself and includes, for example, distraction. A second prominent classification differentiates between approach coping, "oriented either toward the source of stress or toward one's emotions or thoughts," and avoidance coping, "oriented away from the stressor or one's emotions or thoughts" (Compas et al., 2001, p. 92). The coping literature has partly used one of these differentiations and partly used other taxonomies (for an overview, see Skinner et al., 2003). Taken together, the literature has not agreed upon a taxonomy of different coping strategies (Skinner et al., 2003). Similarly, using media has sometimes been included in these taxonomies in different ways or not at all (Compas et al., 2001). Although individuals' coping behaviors depend on situational circumstances, individuals can show a

cross-situationally consistent tendency toward certain coping strategies, referred to as coping styles (Compas et al., 2001).

The choice of a suitable coping strategy is essential for successful coping, but coping effectiveness also depends on the context and the person (Bonanno & Burton, 2013). More precisely, coping effectiveness depends on the fit between the situation–person transaction and the coping response (Lazarus, 1999). According to the transactional model, coping serves as a mediator between the appraisal of a stressful situation and the outcomes that can be distinguished in the short term, including affect and psychological changes, and long-term effects, such as psychological wellbeing and health (Lazarus, 1999).

Related Concepts and Differentiation

Stressful situations nearly always involve emotions and as such, coping with stress and emotion regulation are closely connected (Lazarus, 1999). Similarly, mood management is closely linked to coping (Stevens & Dillman Carpentier, 2017). Focusing only on coping would miss important research traditions in communication. Thus, we treat these processes as having broad overlapping parts, but they can also exist without each other (Gross, 2015). Coping with stress could happen without emotions and moods (even if this is rare). Moreover, emotion and mood regulation refer to regulating not only negative but also positive emotions or moods (Gross, 1998; Larsen, 2000; Segerstrom & Smith, 2019). However, most research on emotion or mood regulation using media has focused on negative emotions and moods (Greenwood & Long, 2009; Nabi & Prestin, 2017), which often relate to stress. Thus, much of the research on emotion and mood regulation using media is relevant for our purposes. We include this research although our focus remains on media use for stress coping.

Guiding Research Questions

To map and review the state of research on the use of media for coping we will focus on three main guiding questions:

RQ1: Which research perspectives have contributed to the topic of coping using media?

RQ2: What kind of theoretical approaches has each of them used?

RQ3: What can we learn from these perspectives and how do their theoretical approaches relate to each other?

In addition, we will briefly look at the methods that were used and ask,

RQ4: How was coping using media studied?

Method

To address these questions, drawing on existing recommended steps (e.g., Munn et al., 2018; Peters et al., 2015) and guidelines for reporting (i.e., Preferred Reporting Items for Systematic reviews and Meta-Analyses [PRISMA]; Moher et al., 2009; Tricco et al., 2018), we conducted a scoping review of coping using media. We searched electronic databases using a thorough search term and screened all titles, abstracts, and subject terms to identify potentially eligible studies according to our inclusion criteria. Relevant items were categorized following a codebook (see Supplemental Material at OSF).

Search Strategy

To identify and select relevant articles, we searched several scientific databases, accessible via EBSCOhost (Academic Search Premier; Communication & Mass Media Complete; EconLit; Library, Information Science & Technology Abstracts; PsyARTICLES; PsycINFO; PSYNDEX). We limited our search to academic journals, journals, books, reviews, and working papers, published in English before January 31, 2019. To account for the similarity between coping with stress, emotion regulation, and mood management, we constructed a comprehensive search term, aiming at a broad range of elicitors (e.g., emotion, stress), responses (e.g., coping), and media (for the search term and its structure, see Online Appendix A). This review aimed at capturing the theoretical concepts and frameworks that studied coping using media on a general level. Thus, we decided to not search for combinations of media and specific coping strategies such as, for example, information seeking or escapism if they were not additionally related to “coping with stress” as described in our search term.

Screening Procedure

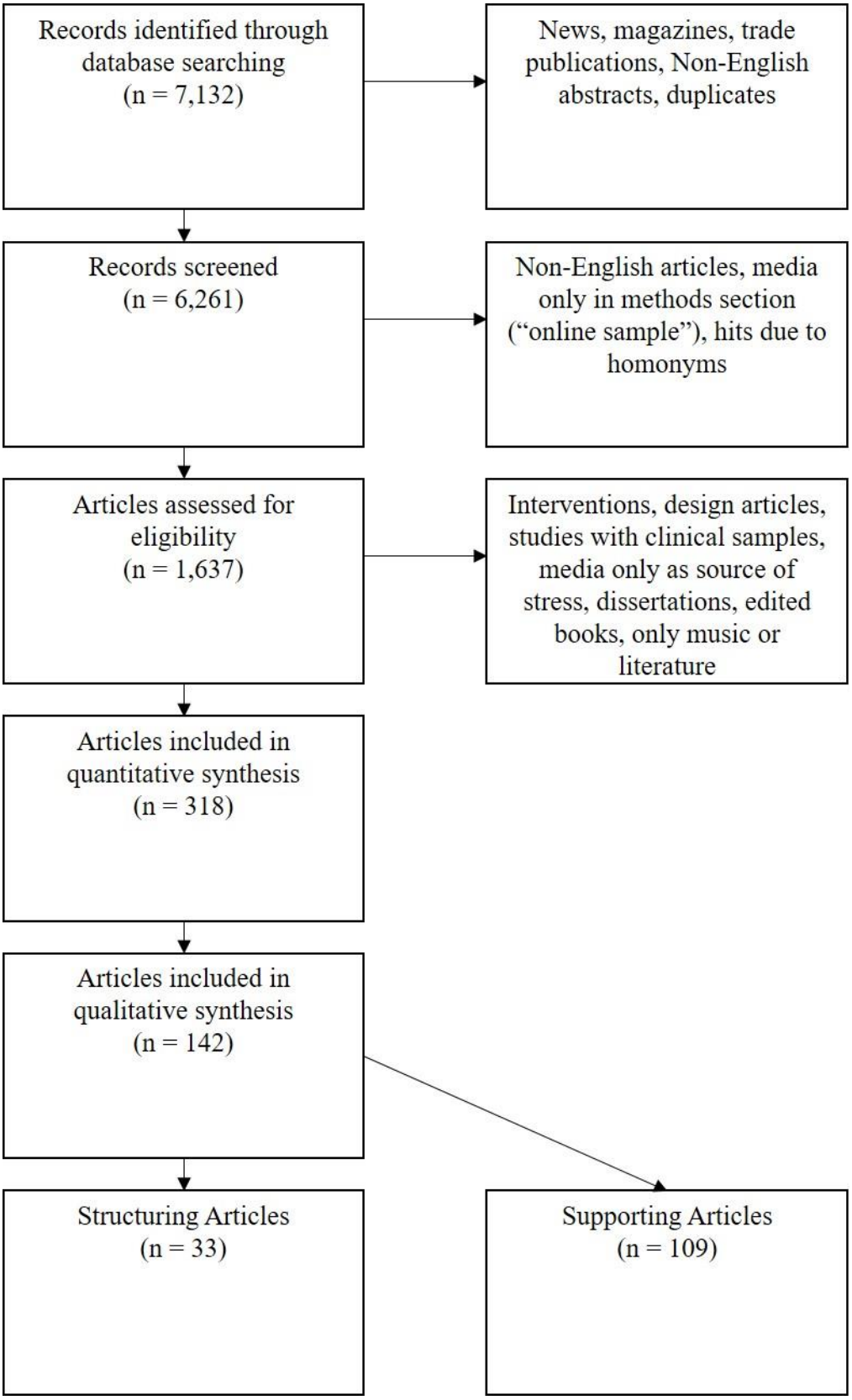
Using the EBSCOhost interface, five trained coders checked the results of 6,261 items for non-English articles and duplicates. They also screened whether an item had only been found due to the use of homonyms (e.g., neuronal web, COPE [Committee on Publication Ethics]) or specific words related to media in the method description [e.g., online survey, Internet access panel]). The exclusion of items that matched these criteria led to a sample of 1,637 articles. We imported them into the bibliographic software Citavi (Swiss Academic Software, 2019), obtained full texts, and proceeded with screening based on a preliminary coding scheme (see Supplemental Material at OSF). As we were not interested in media use as a stressor or in the evaluation of clinical interventions (e.g., cyber-therapy, specific platforms for patients or their families) or clinical samples, these articles were excluded, too. The final sample included 318 articles (see Figure 1 for a PRISMA flowchart of the full procedure).

Article Coding

Four trained coders categorized the remaining articles as (1) highlight articles, which are of particular quality and importance (n = 33; 10%); (2) specific articles, whose scope is rather small (e.g., due to specific samples, situations, or media; n = 176; 55%); and (3) relevant articles that do not fall in one of the two other categories (n = 109; 34%). Highlights were used to identify research perspectives, to integrate and relate theoretical considerations, and to adapt the final coding scheme (e.g., Eschenbeck et al., 2018; Nabi et al., 2017). Relevant articles were used to check the conclusions we drew from the highlights, whereas specific articles were only included in the quantitative, descriptive results. An example of a

Figure 1

Flowchart of Systematic Literature Review, Adapted from Moher et al. (2009).



specific article is Guo (2017), who examined public coping with the Boston Marathon bombing (for the list of all 318 articles, see Supplemental Material at OSF). All articles were coded using the same coding scheme. Following Donovan and Farris (2019), intercoder reliability was not calculated. Online Appendix B shows selected articles' characteristics (for the codebook, see Supplemental Material at OSF).

Results

Our sample shows that the research on our topic has grown considerably since 2010 (see Online Appendix B). According to the disciplines of the journals, in which the articles have been published, the three disciplines that have contributed most widely to this topic were psychology, communication, and medicine. However, we also found articles published in other disciplines' journals such as public health, substance abuse, management and business, and human-computer interaction, showing that the topic of coping using media has emerged in many different disciplines. This diversity has resulted in a wide range of theoretical models and theories. We encountered and coded over 200 theories or models. In sum, the research area can be grouped into three different research perspectives: stress coping (n = 133; 42% of the articles), mood management and emotion regulation (115; 36%), and media addiction (109; 34%; perspectives are not exclusive). In the following, we describe these three perspectives, introduce the most often applied theoretical frameworks, and show how each perspective has contributed to the topic of coping using media. For a comparison table of these perspectives, see Online Appendix B.

Stress and Coping (SC) Perspective

The respective articles approached the topic of coping using media from a stress management perspective and based their research on traditional stress management theories (e.g., Plante et al., 2019; Reinecke, 2009; Van Ingen et al., 2016). The most used theoretical model was the transactional model by Lazarus and Folkman (1984), already outlined above (49%).

There was also an emphasis on social support (22%), for example, when the buffering hypothesis (Cohen & Wills, 1985), which proposes that social support reduces negative effects of stress, served as the theoretical foundation (6%; e.g., Wright, 2000). Although reviews or meta-analyses have demonstrated the large body of research on media-based social support (e.g., Domahidi, 2018; Meng et al., 2017), we only found a few of these articles with our search, which implies that the coping perspective did not belong to their predominant theoretical frameworks. One explanation could be that those articles looked at social support and social capital not as a response to stress but rather as a resource (cf. Domahidi, 2018). Articles belonging to the SC perspective focused on the Internet/digital media in general (30%), social media (25%), TV (12%), and mobile device use (11%). In addition, some articles discussed the theoretical role of media on a general level (17%). Compared with the other perspectives, social media played a greater role within this perspective, whereas games (9%) were discussed less frequently.

The first crucial contribution of the SC perspective is that its findings demonstrated how vital media use is for coping processes. In qualitative studies, media use emerged as one of the most important coping behaviors in very different contexts (e.g., I. R. Hunter & Gillen, 2009; Lapp et al., 2010). Quantitative studies have also found media use to be one of the most used coping behaviors (e.g., Bland et al., 2012; Nabi et al., 2017). This underlines the importance of studying media use for coping purposes both as a motive for media use and as a behavior in the stress management process.

Despite this importance, there is no deeper reflection on the exact function of media in the transactional theory of stress or other models (Nabi et al., 2017). One can differentiate two main distinct functions. First, media has been conceptualized as a “facilitation” of coping strategies that can also be accomplished without media (e.g., Hutchinson et al., 2006; Van Ingen et al., 2016). For instance, one can vent one’s emotions by posting on social media and by

screaming out loud (Van Ingen et al., 2016). This view implies that media use is not a separate strategy but belongs to an independent dimension of coping. Second, media use has been seen as a strategy itself, distinct from other strategies that do not include media use. For instance, media use was compared with other strategies like "being alone" (Chen & Kennedy, 2005) or to avoidance coping or problem solving (Eschenbeck et al., 2018). Thus, the transactional model (Lazarus & Folkman, 1984) can serve as a basic framework for including media in the coping process but the exact function of media remains unclear.

Interestingly, research from SC has predominantly focused on media use for emotion-focused strategies and social support and its relationship with an emotion-focused coping style, whereas media use for problem-focused coping has been often neglected (for similar points, see Van Ingen et al., 2016; Watson, 2018). However, exceptions— for example, "therapeutic blogging" or the use of health-related online support groups—were also associated with a problem-focused coping style (Baker & Moore, 2011; Wright & Rains, 2014).

Mood Management and Emotion Regulation Perspective (MM/ER)

The second perspective includes research dealing with moods and using media to regulate emotions (e.g., Bowman & Tamborini, 2015; Greenwood & Long, 2009; Hoffner & Lee, 2015). The most frequently used theories or models were mood management theory (MMT; Zillmann, 1988a, 1988b) (51%), Gross's (1998) process model of emotion regulation (20%), and the uses and gratifications approach (U&G; Katz et al., 1973) (18%). In this perspective, a diverse range of media types including online media such as games (19%), social media (18%), Internet/digital media (17%), mobile devices (10%) but also traditional media such as TV (17%) and movies (6%) and media at a general level (23%) was discussed.

In MMT, Zillmann (1988a, 1988b) proposed that a person tries to maintain a good mood and to alter a bad mood by selecting stimuli that either distract or do not distract, and by choosing stimuli that either increase or reduce excitement. Thus, individuals choose or avoid media and other stimuli according to their absorption potential, their excitatory potential, their

semantic affinity, and their hedonic valence (Zillmann, 1988a, 1988b). According to MMT, individuals learn how effective their regulation was and use this for future mood regulation. One important extension of MMT is *mood adjustment*, which states that pursuing a good mood might not always be the most successful strategy depending on situational circumstances (e.g., in an exam). It predicts that individuals choose media stimuli in order to adjust their mood to the most beneficial mood for the current circumstances or upcoming events (Knobloch-Westerwick, 2006, 2015; Luong & Knobloch-Westerwick, 2017).

In communication science, research on MMT and related models provides the broadest and most prominent perspective on coping using media—although managing one's mood has rarely been explicitly described as a coping process. Stevens and Dillman Carpentier (2017) argued that MMT can be situated in the wider context of coping, considering it as a strategy of avoidance coping. In their work, using moodcongruent media for actively approaching stress-evoking problems can extend the ideas of MMT to explain a broader range of media choices. MMT research uses the term *mood* but has been criticized for using emotion-inducing instead of mood-inducing manipulations (Knobloch-Westerwick, 2006, 2015). Thus, the boundaries between research on mood management and on emotion regulation are blurred (e.g., Hoffner & Lee, 2015; Konijn & ten Holt, 2011).

According to Gross (2015, pp. 4–5), emotion regulation "refers to attempts to influence which emotions one has, when one has them, and how one experiences or expresses these emotions." He differentiated five emotion regulatory processes, which have all been studied in relation to media use: the selection or avoidance of a situation (e.g., Ossenfort & Isaacowitz, 2018; Sands et al., 2016), the modification of a given situation (e.g., Sands et al., 2016), the decision of which element of a situation one focuses on (attentional deployment; e.g., Döveling, 2015), the construction of meaning in a situation (cognitive change; e.g., Suckfüll, 2013), and the regulation of one's internal response (e.g., Nishio et al., 2013). The

research on media use for emotion regulation has mainly focused on negative emotions (Nabi & Prestin, 2017).

The U&G postulates that humans use media to gratify their needs. This motivates users to select certain media stimuli. After usage, they evaluate their obtained gratifications and learn for their future media selection (Katz et al., 1973). One set of gratifications users can obtain from using media refers to stress relief, emotion, and mood regulation (Elhai et al., 2018; Finn & Gorr, 1988; Leung, 2007; Roe & Minnebo, 2007). The MM/ER shows that the U&G can be a fruitful framework for the combination of media use and coping. However, the U&G focuses on the active and conscious selection of media stimuli (Katz et al., 1973), whereas mood, emotion regulation, and coping include conscious and unconscious processes (Gross, 1998; Knobloch- Westerwick, 2006; Lazarus, 1999).

MMT and the process model of emotion regulation, on which most research in this perspective is based, almost exclusively address emotion-focused coping, and, thus, media use is mostly associated with an emotion-focused coping style (e.g., Reinecke, 2009). Interestingly, whereas emotion-focused coping is often seen as maladaptive in the coping literature (cf. Lazarus, 1999), it has been treated within MM/ER mostly as an adaptive regulation (e.g., Stevens & Dillman Carpentier, 2017). Similarly, media use was mostly seen as an adaptive choice and described as facilitation of regulation (Gaetan et al., 2016; Hoffner & Lee, 2015)—as a tool that "affords a highly flexible and personalized form of affect regulation" (Greenwood & Long, 2009, p. 616). Several articles in our sample have shown that the MM/ER's emphasis on emotion-focused and avoidance coping and distraction can be also expanded on problem-focused and approach strategies by integrating MMT or the process model of emotion regulation with other theoretical approaches (Nabi et al., 2006; Reinecke et al., 2012; Stevens & Dillman Carpentier, 2017). Also, mood adjustment broadens the focus of the MM/ER on emotion and moods by emphasizing other goals that include directly approaching a problem (Knobloch-Westerwick, 2006).

In contrast to SC, MM/ER sheds light on specific media characteristics that are important for coping, including the MMT factors of absorption potential, excitatory potential, semantic affinity, and hedonic valence. Besides in MM/ER, a broader range of media types is examined. Consequently, this perspective's contribution strongly emphasizes the role of the media content and its characteristics, which is neglected in the other perspectives. By shedding light on media characteristics, MM/ER also provides insights into the selection of media stimuli and its relation to certain coping strategies: MMT, for example, predicts that—when coping with stress—media users should avoid content associated with the stressors. This can be seen as a form of avoidance coping (Nabi et al., 2006; Stevens & Dillman Carpentier, 2017).

Media Addiction and Problematic Media Use Perspective (MA/PMU)

Coping through media use has become a major topic in research on media addiction in the last years. Using something to cope with stress has been used as a criterion for other addictions like substance use. Researchers have transferred this criterion to gaming and Internet addiction (Loton et al., 2016). This has resulted in a large number of studies that investigated the association of some form of coping with some form of problematic use (e.g., Laier & Brand, 2017; Plante et al., 2019). MA/PMU mostly discussed the use of digital media or the Internet in general (53%), followed by games (29%), social media (12%), and mobile devices (12%). Traditional media like TV (2%) only played a minor role.

Two of the most frequently used models in MA/PMU, the transactional model (16%) and the process model of emotion regulation (12%), both indicate that all three perspectives are interrelated. There were, however, also models that were specific to MA/PMU. The most frequently used model was the cognitive-behavioral model of generalized problematic Internet use (34%) introduced by Davis (2001) and updated by Caplan (2010). Davis (2001) theorized that generalized problematic Internet disorder is preceded by psychopathology. In com-

bination with a reinforcing use of the Internet, psychopathology leads to maladaptive cognitions, which then transfer to pathological Internet use. One of these maladaptive cognitions and an important factor for developing pathological Internet use is "Internet use for mood regulation," which Caplan (2010) integrated into Davis's model.

Studies have also frequently applied Kardefelt-Winther's (2014) model of compensatory Internet use (12%). Its basic assumption is "that the locus of the problem [of Internet use disorders] is a reaction by the individual to his negative life situation, facilitated by an Internet application" (Kardefelt-Winther, 2014, p. 352). The coping strategy "Internet use" is effective in reducing negative affect. But it can substitute other coping strategies such as meeting friends, which in turn leads to a problematic amount of compensatory Internet use.

From the MA/PMU, coping using media is often seen as completely negative. For instance, computer games were described as "inadequate means of coping with frustration, stress, and fears" (Weinstein, 2010, p. 273); the thought that Internet applications might help to relieve stress was seen as a "general dysfunctional coping style" (Laier & Brand, 2017, p. 10); and "media-focused coping" all in all was evaluated as a "dysfunctional coping strategy" (Kuss et al., 2017, p. 74). However, others emphasized that media can be used functionally and only become maladaptive if the ability to use alternative coping strategies or tools decreases (e.g., Loton et al., 2016; McNicol & Thorsteinsson, 2017). One factor for PMU that may play a role here is the salience of a specific media application (e.g., Loton et al., 2016). Something is seen as salient if it "dominates a person's cognitions and behavior" (Loton et al., 2016, p. 566). Cheng et al. (2015) drew on this idea and proposed that Internet addiction is linked to coping inflexibility. This implies that a high salience of one coping behavior like the use of a particular media type can relate to lower coping flexibility.

Connected to a high salience of coping behaviors is the idea that dispositional coping styles influence the development of a problematic usage pattern (e.g., Brand et al., 2014; Schneider, King, & Delfabbro, 2018). Within MA/PMU, problematic use is usually associated

with avoidance (e.g., Brand et al., 2014) or emotion-focused (e.g., Schneider, King, & Delfabbro, 2018) coping, which is equated with a "negative" coping style (e.g., Li et al., 2016).

Another research perspective deals with the media use of individuals when they or their loved ones face an illness. We did not include those studies—along with clinical samples and interventions—because our focus lies on media use for coping in everyday life. What this research, however, adds to the perspectives introduced above is that media can be used for problem-focused coping including the search for information or the active approach of a problem (e.g., Sassenberg & Greving, 2016; Wright & Rains, 2014).

A Short Note on the Methods Represented in the Articles

Although our scoping review focuses on the theoretical conceptualizations, we provide a brief summary of the methodological approaches in Online Appendix B. In sum, 273 studies that also empirically assessed coping using media were included in our sample. Most empirical studies were based on quantitative surveys, of which 188 used cross-sectional and 28 longitudinal designs. To measure media use or coping, most studies relied on self-reports (223 and 221, respectively). Concerning coping measurement, we saw multiple different instruments: Throughout our sample, over 130 different scales were used. Coping efficacy was rarely measured in non-experiments. Of the 37 experiments in our sample, 28 measured coping efficacy in some way (e.g., mood repair; Rieger et al., 2015). Most experiments compared different variations of similar media content (e.g., different task demand levels for computer games; Bowman & Tamborini, 2015). Moreover, using media for coping was rarely compared with non-media coping options (for a summary table of the experiments and how effectiveness was assessed, see Online Appendix C).

Integration and Critique: Six Advancements

The three research perspectives—SC, MM/ER, and MA/PMU—show a wide diversity in theoretical approaches. We think that each of the perspectives contributes to different aspects of the process and that an integration of these perspectives can lead to a better

understanding of the coping process when media are involved. We also think that each of the perspectives will benefit from the insights and contributions of the other fields. The following six advancements are based on contributions of the three perspectives but integrate and develop these contributions into a broader context (see Table 1 for an overview of the contributions of the three perspectives). The six advancements aim at integrating the different approaches and outline starting points for future research.

Extending the Transactional Model: Introducing Coping Tools Into the Model

We think that the transactional stress model is generally a suitable starting point for studying coping using media as it is applicable to a wide variety of contexts and individuals and provides a framework for dynamic processes (e.g., Biggs et al., 2017). The numerous studies that have applied it in this diverse research area (21%; see Online Appendix B) support this view. However, how media use can be situated within the coping process remains unclear. We argue against seeing media as just another coping strategy. Research across all three perspectives supports that media can be used for various coping strategies (e.g., Van Ingen et al., 2016). Thus, it seems more fruitful to conceptualize media applications as manifestations of a dimension of coping, lying orthogonal to coping strategies: as a "coping tool" (Soldatova & Zotova, 2013).

Following this conceptualization, individuals decide on two things when they evaluate their coping options in their second appraisal: (1) the coping strategy or *coping goal* (Hutchinson et al., 2006) and (2) the *coping tool*. (1) First, coping strategies or goals can be defined as "objectives or intents of coping responses" (Compas et al., 2001, pp. 88–89). Measuring and

Table 1

The Six Advancements and the Contribution of the Three Perspectives

Advancement	Perspective	Contribution
(1) Extending the transactional stress model	SC	Provides two ways of integrating media into the transactional model (other dimension/another strategy), some authors already write about media as coping tools
	New	Integrates media use as coping tool into the transactional stress model
	MM/ER	Discusses description of media characteristics that might be suitable for a classification of coping tools (mood management theory)
(2) Avoiding the uniform efficacy through a situational perspective	MM/ER	Media use can be an adaptive coping option
	MA/PMU	Media can be a maladaptive coping option
	New	Describes media applications as coping options that can be adaptive as well as maladaptive, emphasize situational perspective
(3) Regulatory/Coping flexibility	MA/PMU	Introduces first link between problematic media use and coping flexibility
	All persp.	Describe media as facilitation of coping
	New	Introduces coping flexibility as important construct and proposes negative associations with problematic use but also positive associations with non-problematic use
(4) Efficiency and efficacy	All persp.	Describe media as facilitation of coping
	New	Introduces effort and efficiency as important constructs that shape the choice of coping options and their outcome
(5) Perceived efficiency and salience	SC & MM/ER	Introduces learning process: People rely on past experiences for their choice of a coping option (transactional model, mood management theory, and uses and gratifications)
	MA/PMU	Introduces salience as important factor in the choice of a coping option
	New	Derives perceived efficiency/perceived efficacy and salience as important factors for the choice of coping options
(6) A call for methodological innovation	*New*	For an advancement of the field on the basis of (1)–(5), methods and measures for situational efficacy and efficiency, coping flexibility, and of perceived efficiency and salience of coping tools/strategies are necessary; innovative methods and measures of unconscious processes are necessary
Already existing contributions of the perspectives to necessary measures	SC & MM/ER	Experimental approaches to measure situational efficacy
	MA/PMU	Measurement instruments of the salience of media tools for coping (within measures of problematic media use), first measure for coping flexibility
	MM/ER	Measures of perceived efficacy of media tools within research on uses & gratifications research
	SC	Measures of the perceived efficacy of coping strategies within measures of coping styles or coping tendencies

Note. Abbreviation of perspectives: SC = Stress and coping, MM/ER = Mood management/Emotion regulation, MA/PMU = Media addiction, problematic media use; *New* stands for the contribution of this review.

developing universal lists of these strategies or goals has been shown to be problematic because categories are rarely distinct or suitable for universal application (Skinner et al., 2003). Thus, several taxonomies have been developed that list different strategies or goals on different levels that can be relied upon dependent on the particular context of a study (e.g., Carver et al., 1989; Knobloch-Westerwick et al., 2009; Skinner et al., 2003). (2) Second, we define coping tools as instruments through which (a) a coping goal can be achieved and (b) a coping behavior can be performed. A tool can be a media application or another coping response like talking to other people or using one's own imagination. Different tools can be used for different strategies (for a similar point, see Katz et al., 1973). For instance, one can use a mobile phone or one's own imagination for distraction. Mobile phones can also be used for social support. Again, different abstraction levels are possible (e.g., one movie vs. another movie; a mobile phone vs. talking in person). Regarding the stable use of strategies and tools, we can subsequently extend the definition of coping styles as "a person's general tendency or enduring disposition to handle stressors with a specific constellation of coping strategies" (Li et al., 2016, p. 409) to apply to *coping tools* as well. Following MMT, it might be suitable to classify the tools by their absorption potential, excitatory potential, semantic affinity, and hedonic valence (Zillmann, 1988a).

Thus, individuals may choose a specific combination of strategies and tools to cope in a particular situation. Accordingly, the efficacy of this way of coping is then determined by *the fit* between the *person-situation transaction* and the *strategy-tool combination*. We assume that certain combinations of strategies (e.g., self-distraction and computer games, avoidance coping with stressor-unrelated content or information seeking and search engines) are used more frequently than others. Moreover, specific combinations might fit certain situations in a particular way (see also Nabi et al., 2017; Van Ingen et al., 2016). With our extension of the transactional model, these combinations and their relationship to situational circumstances and particular stressors can be examined more systematically.

Avoiding the Fallacy of Uniform Efficacy Through a Situational Perspective

Bonanno and Burton (2013, p. 592) defined the fallacy of uniform efficacy as "the tendency to assign a value judgment about the consistent efficacy or consistent lack of efficacy of a particular regulatory strategy." Research has shown that, as theorized by Lazarus and Folkman (1984), the consistent judgment of strategies as (in)effective is not appropriate (for an overview, see Bonanno & Burton, 2013). The same should hold true for coping tools.

In MA/PMU, media use for coping is often judged as uniformly ineffective. Similarly, media use is regarded as consistently effective in some MM/ER research. Throughout the literature, we saw that the fallacy to evaluate media use as a uniformly adaptive or maladaptive coping behavior appears in quite a large amount of the literature about coping using media. We argue that the efficacy of coping by using media must be evaluated from a *situational* point of view and that future research – instead of judging the uniform efficacy – should study the *boundary conditions* of efficiently using media for coping with stress.

One important boundary condition is the timing of coping behaviors (e.g., directly in the stressful situation, after the stressful situation), which has so far only been considered in studies about coping with particularly stressful events (e.g., coping with the death of a loved one; DeGroot & Carmack, 2013) but less in the context of everyday strain. In SC and MM/ER, qualitative studies about stressful events suggest that media use for coping can differ according to the timing (e.g., DeGroot & Carmack, 2013; Watson, 2018).

Regulatory/Coping Flexibility and Media Use for Coping

As proposed by Cheng et al. (2015, MA/PMU), regulatory or coping flexibility is a concept that is understudied in the literature on coping using media. Coping flexibility is a personality trait that is defined as "intra-individual variability in the deployment of diverse coping strategies and, more importantly, the capacity to exhibit such variability in a way that fosters adjustment to life changes" (Cheng et al., 2014, p. 1582). According to our conceptualization, coping flexibility should also include the flexible deployment of coping tools and,

thus, a decrease of coping flexibility might more adequately predict types of problematic media use than using media for coping per se. Moreover, as authors from all three perspectives suggested that media facilitate coping, it is also worth looking at positive associations between media use and adoption, and coping flexibility.

Efficiency and Efficacy

The term "facilitation" of coping used in all three perspectives also refers to another important point. Stress is by definition a situation in which someone is overstrained. Thus, the literature on coping using media should not only look at the efficacy of coping using media (in specific situations in combination with specific strategies), it is also important to look at the costs (Bonanno & Burton, 2013)—how much effort does a certain coping tool require?—and the combination of costs and benefits. Consequently, coping efficiency is a construct that should receive considerably more attention. Although this is inherent to the term of "facilitation," it has not yet been clearly included in theoretical conceptualizations nor in measurements.

Perceived Efficiency and Salience as Important Factors for the Choice of Coping Options

Both MMT (MM/ER) and the transactional model (SC) include a learning process that connects the perceived efficacy (or efficiency) of past regulation behavior with the selection of coping options (Lazarus, 1999; Zillmann, 1988b). Accordingly, it could be useful to conceptualize *perceived efficiency* as an important factor for the choice of both a coping strategy and a coping tool. The MA/PMU adds that in some situations, it might not be solely the perceived efficiency that influences the choice of coping options and, therefore, also the selection of media: Especially in situations in which coping is unconscious, another important factor in the selection of coping options might be the *salience* of a coping strategy or tool. Thus, we suggest that perceived efficiency and salience are inherently linked to the choice of a coping strategy and a coping tool in a particular situation. For instance, if individuals perceive social

support seeking in a particular Instant Messenger (IM) group with friends as efficiently reducing stress, they will turn to this combination of strategy and tool when being confronted with stress more often. Similarly, if this group is highly active and the phone keeps alerting due to new messages in this group, the instrument (IM group) might also be salient in a stressful situation and will, therefore, be used with a higher probability.

Moreover, perceived efficiency and salience can also be related to individuals' stable tendencies to use a strategy or a tool when confronted with stress. Stable tendencies could increase the salience of having such options. If somebody has, for example, developed a tendency to avoid stressors, distraction as a coping strategy and tools that have proven useful for this strategy (e.g., TV) can be more salient in a stressful situation. Furthermore, efficiency and salience could play a crucial role in *developing* certain coping styles as a high frequency of using certain strategies and tools may result in an enduring tendency to use them.

A Call for Methodological Innovation

We see several methodological issues that should be addressed by future research: First, a large number of studies relied on self-report measures. Given that many of the underlying processes are unconscious, such an approach could paint an incomplete or inaccurate picture. Thus, it is necessary to have measures that do not expect participants to judge their own general use of media for coping. For measures of problematic media use, the measurement of coping and media use were often mixed in the same measure. For instance, the report of media use for coping or mood regulation was included in an index of problematic media use (e.g., Adolescent Preoccupation with Screens scale, J. F. Hunter et al., 2018). This can be seen as a methodological manifestation of the fallacy of uniform (in)efficacy described above and, therefore, can be viewed critically. Related to this, in most studies in our sample, coping efficacy was rarely measured, if at all, on a situational level (e.g., considering the fit between the situation–person transaction and coping). In experiments, coping using media was often compared between groups using variations of the same media content, which makes it hard to

identify coping efficacy patterns on a more general level. Coping efficiency was not measured at all. Measurement of fit on a situational level is complex but still necessary, and thus, we see a strong need for developing innovative instruments for coping efficacy and coping efficiency. Innovative measures should be applicable across media types and contexts, so they can additionally help to consolidate the multiplicity of used instruments. Finally, given the diversity of measures of media use, most measures seem to lack an appropriate level of specificity. Using terms like *the Internet* or *digital media use* for coping are too vague. Consequently, more concrete and fine-grained levels of measurement are necessary.

With these six advancements, we contribute to the development of a common ground for research on coping using media. These advancements are informed by theoretical conceptualizations of different research perspectives and show that integrating these different perspectives can advance the research area as a whole and also each perspective individually.

Discussion

In our scoping review, we saw that the research on coping using media is manifold. With over 200 identified theories and models, there was a large heterogeneity across multiple scientific disciplines, such as communication, psychology, and medicine. Moreover, approaches to and conceptualizations of coping using media within the disciplines were diverse. The three perspectives – SC, MM/ER, and MA/PMU – have each contributed to different aspects of the process of coping using media, depending on the primary focus of the perspective: adaptive or maladaptive processes, the coping process, or media characteristics. Several ideas, such as learning processes or the idea of coping facilitation through media, have been mentioned in all research areas. We think that all of these perspectives benefit when they also pay attention to the interrelations with each other, as this, for example, can reduce the fallacy of uniform efficacy. Thus, we advocate for more integrated communication and knowledge sharing. We aim at providing the groundwork for such an integration.

Concerning the relative importance of the six advancements, we suggest particularly valuable advancements for each perspective. The SC might benefit the most from considering the differentiation between coping strategy and tool and from more explicitly measuring situational efficacy and efficiency. This holds true for research on coping of certain groups (e.g., children) but also for research on specific applications (e.g., social network sites). Moreover, we think a broader look at the use of media for problem- focused and approach strategies is important within this perspective. The MM/ER should integrate and conceptualize maladaptive forms of media use for coping purposes. By placing media use for emotion-focused or avoidance strategies into the bigger picture of coping strategies, this field might be able to contribute to an even broader range of media choices and effects (Stevens & Dillman Carpentier, 2017). Finally, the MA/PMU might particularly benefit by integrating the ideas about coping flexibility and its relation to problematic forms of media use, and by acknowledging adaptive forms of coping using media. However, before studying these suggested research topics, innovative measures – especially for coping efficacy, efficiency, and flexibility in the context of media use for coping – need to be developed.

With these contributions in mind, we admit that the diversity and multiplicity of approaches have led to limitations of our work. Firstly, we spotted several articles that were related to our topic but were not found with our search (e.g., Domahidi, 2018; Knobloch-Westerwick et al., 2009; Rieger et al., 2017). Diversity in approaches usually leads to diversity in wording and, thus, we would argue to have provided a comprehensive but not exhaustive picture of research on media use for coping. This is particularly the case for the field of health communication, which we have only touched upon.

This, secondly, also applies to some interesting aspects and smaller fields within our sample. The attempt to integrate approaches of 318 articles has inevitably led to a simplification of research and an omission of exotic but fascinating aspects and models. With the focus on the main research perspectives, we have neglected smaller but growing fields (e.g., need

threats, Schneider et al., 2017; recovery and resilience, Reinecke & Rieger, in press; or social support, Wright, 2000). Although we did not have the space to shed light on these fields here, we think these areas can also profit from our advancements as several ideas can be integrated into these fields as well. For example, the factors of perceived efficiency and salience can be valuable for studying the selection of tools and strategies to cope with need threats. Similarly, the idea of a situational fit might be useful to explain and further study situational differences in the effectiveness of media use for recovering from strain but also for studying the boundary conditions of using media for receiving helpful social support.

Moreover, as we focused on conceptualizations of coping using media on a more general level, we did not investigate specific coping strategies. Again, we think that the six advancements can still help researchers who examine specific strategies (e.g., avoiding the fallacy of uniform efficacy can help research on escapism using media; see Hastall, 2017, for a similar point). Besides, we think that for specific coping strategies or coping families that received wide attention in communication research (e.g., escapism, information seeking and avoidance, social support seeking), separate reviews and meta-analyses building on a coping perspective would be valuable. Likewise, as we did not investigate efficacy or constellations of typical coping strategies and coping tools (e.g., media types), scrutinizing such patterns in previous literature and new research is an important and interesting avenue for future research for which our extension of the transactional model can be particularly helpful.

As a last limitation, the groundwork for integration we lay with our six advancements can be developed further. In our first advancement, we argued to build on the transactional stress model and its successors (for an overview, see Biggs et al., 2017). However, this model – especially in its initial form – has also received criticism (e.g., during the stress process, positive and negative emotions can exist simultaneously; see, for example, Folkman & Moskowitz, 2004). The advantage to build on an existing, established model is that our advancements can be placed into a broader framework and connected to the broad work on this model.

However, extending our advancements to the conceptualization of a new model on coping using media that also addresses the critical points of the transactional stress model might be a valuable avenue for future work. In this article, we focused on a more open approach to advance the diverse field of coping using media.

Our review can be placed within the larger discussion on the relation of media use and wellbeing: Media provide additional coping options, can *potentially* lead to an increase in individuals' coping repertoire, help to adapt to stressful situations, and increase wellbeing in the long run. However, if certain media types replace other successful coping options, media use for coping can also be detrimental for wellbeing. Taken together, the three perspectives we reviewed here show that seeing the relation between media use and successful coping and wellbeing as exclusively positive or negative remains short-sighted: Future research should focus on situational (e.g., situational fit), media characteristics (e.g., semantic affinity) as well as individual factors (e.g., coping flexibility) on which this relation depends.

Conclusion

We think it is important that the field using media for coping remains diverse and stays open to contributions of different disciplines and perspectives, as there are different media types and stressors that each have to be studied in the light of a unique theoretical background. However, we also think it is valuable for each of the perspectives to learn from the viewpoints and findings of other contributors. We argue that the viewpoints of the different perspectives can be integrated by extending the transactional model, by differentiating between coping strategies and coping tools, by building on a situational perspective, and by focusing more on the concepts of coping flexibility and efficiency. With this article and the six advancements, we aim at laying the groundwork for a communication and learning process across the boundaries of different perspectives and disciplines.

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APPENDIX PAPER 1

APPENDIX A

Structure for EBSCO Search Term

Elicitor		Response		Media
(stress* OR threat* OR emotion* OR mood)	AND	(coping OR cope)	AND	(Internet OR web* OR online OR digital OR cyber OR "social media" OR "social network site*" OR Instagram OR facebook OR (video N1 stream*) OR movie* OR "video gam*" OR (computer N1 gam*) OR gaming OR forum OR portal OR blog OR "instant messag*" OR "instant messenger*" OR "mobile device*" OR "mobile phone*" OR smartphone* OR tablet OR TV OR television OR ("online support" N1 group*) OR ("user-generated" N1 media) OR media)
(stress* OR emotion* OR mood)	W1	(regulation OR management)		

Note. Keywords were searched for in the title, the abstract, or the keywords of an article. N1 (Near Operator 1) = words can be a maximum of one word apart from each other; W1 (Within Operator 1) = words that are within one word of another. See OSF for the full syntax of the search term

APPENDIX B

*Selected Summaries and Frequencies of Reviewed Articles (*N = *318)*

			SC (*n* = 133)		MM/ER (*n* = 115)		MA/PMU (*n* = 109)	
	n	%	*n*	%	*n*	%	*n*	%
Years (Focused Media)								
1980s (Media in general, TV)	7	2%	2	2%	4	3%	0	0%
1990s (Media in general, TV/Movies)	9	3%	5	4%	4	3%	0	0%
2000s (Media in general, TV/Movies, Games)	38	12%	19	14%	17	15%	5	5%
2010–15 (Internet, Games, Social Media)	107	34%	45	34%	38	33%	34	31%
2016–17 (Internet, Games, Social Media)	98	31%	37	28%	29	25%	48	44%
2018–19 (Internet, Games, Social Media)	59	19%	25	19%	23	20%	22	20%
Theoretical Approaches								
Stress Coping (SC)	133	42%	133	100%	-		-	
Mood Management (MM)/Emotion Regulation (ER)	115	36%	-		115	100%	-	
Media Addication (MA)/Problematic Media Use (PMU)	109	34%	-		-		109	100%
Other	11	3%	-		-		-	
Type of Article								
Empirical	273	86%	120	90%	93	81%	97	89%
Theoretical only	45	14%	13	10%	22	19%	12	11%
Type of Elicitor (e.g., stress, emotion, mood, threat)[a]								
Daily Hassles	248	78%	83	62%	95	83%	102	94%
Stressful Life Event	100	31%	69	52%	31	27%	9	8%
Discipline of the Outlet (Journal/Book) (3 Most Frequent)[a]								
Communication	61	19%	25	19%	41	36%	1	1%
Psychology	179	56%	64	48%	65	57%	79	72%
Medicine	51	16%	14	11%	10	9%	36	33%

(table continues)

APPENDIX B (*continued*)

			SC (*n* = 133)		MM/ER (*n* = 115)		MA/PMU (*n* = 109)	
	n	%	*n*	%	*n*	%	*n*	%
Methodological Approaches[a]	(*n* = 273)		(*n* = 120)		(*n* = 93)		(*n* = 97)	
Quantitative Survey: Cross-sectional	188	69%	67	56%	48	52%	78	80%
Quantitative Survey: Longitudinal	28	10%	9	8%	10	11%	13	13%
Qualitative Survey/Interviews	28	10%	22	18%	8	9%	1	1%
Content Analysis: Quantitative	16	6%	11	9%	8	9%	0	0%
Content Analysis: Qualitative	21	8%	16	13%	4	4%	1	1%
Experiment	37	14%	10	8%	26	28%	1	1%
Observation	11	4%	3	3%	4	4%	6	6%
Measurement of Media Use (Most Frequent)[a]	(*n* = 273)		(*n* = 120)		(*n* = 93)		(*n* = 97)	
Existing Instruments/Scales (Based on Self-Report)	124	45%	32	27%	31	33%	89	92%
Internet Addiction Test (Young, 1998)[b,c]	35	28%	5	4%	4	3%	30	34%
Generalized Problematic Internet Use Scale (Caplan, 2002, 2010)[b,c]	17	14%	3	3%	1	1%	17	19%
Frequency/Duration (Based on Self-Report)	74	27%	32	27%	35	38%	25	26%
Qualitative/Open-ended question	70	26%	43	36%	19	20%	14	14%
Manipulation	32	12%	10	8%	24	26%	1	1%
Measurement of SC/MM/ER/MA/PMU (Most Frequent)[a]	(*n* = 254)		(*n* = 115)		(*n* = 84)		(*n* = 91)	
Existing Instruments/Scales (Based on Self-Report)	164	65%	60	52%	56	67%	84	92%
Internet Addiction Test (Young, 1998)[b,c]	35	21%	5	8%	4	7%	30	36%
Generalized Problematic Internet Use Scale (Caplan, 2002, 2010)[b,c]	17	10%	3	5%	1	2%	17	20%
COPE Inventory (Carver, Scheier, Weintraub, 1989) / Brief COPE (Carver, 1997)	20	12%	12	20%	4	7%	9	11%
Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003)	12	7%	2	3%	8	14%	6	7%
Qualitative/Open-ended question	70	28%	46	40%	17	20%	13	14%
Manipulation	10	4%	5	4%	7	8%	0	0%

(table continues)

APPENDIX B (*continued*)

			SC (*n* = 133)		MM/ER (*n* = 115)		MA/PMU (*n* = 109)	
	n	%	*n*	%	*n*	%	*n*	%
Main Theories/Models/Concepts (Most Frequent)[a]	(*n* = 203)		(*n* = 79)		(*n* = 93)		(*n* = 58)	
Mood Management (Zillmann, 1988a, 1988b)	47	23%	6	8%	47	51%	2	3%
Transactional Stress Model/Cognitive-Relational Theory of Stress (Lazarus, 1999 / Lazarus & Folkman, 1984)	43	21%	39	49%	7	8%	9	16%
Emotion Regulation (Gross, 1998)	20	10%	0	0%	19	20%	7	12%
Uses & Gratifications (Katz, Blumler, & Gurevitch, 1973)	20	10%	6	8%	17	18%	3	5%
Cognitive-behavioral Model of Generalized Problematic Internet Use (Caplan, 2002, 2010; Davis, 2001)	20	10%	3	4%	3	3%	20	34%
Social Support	18	9%	17	22%	2	2%	1	2%
Model of Compensatory Internet Use (Kardefelt-Winther, 2014)	8	4%	0	0%	2	2%	7	12%
Media types discussed[a]	(*n* = 318)		(*n* = 133)		(*n* = 115)		(*n* = 108)	
Internet / digital media in general	99	31%	40	30%	19	17%	57	53%
Social media	68	21%	33	25%	21	18%	13	12%
(Computer) games	58	18%	12	9%	22	19%	31	29%
Media in general	44	14%	23	17%	26	23%	1	1%
TV	36	11%	16	12%	19	17%	2	2%
Mobile device	29	9%	15	11%	11	10%	13	12%
Instant Messenger	10	3%	7	5%	4	4%	0	0%
Movies	9	3%	3	2%	7	6%	0	0%
Blogs	9	3%	5	4%	6	5%	0	0%
Other	31	10%	12	9%	10	9%	6	6%

[a]Multiple categories were possible.
[b]Includes the original scale, adapted versions, versions translated into other languages, short forms.

[c]These scales were mostly used as measures for both media use and coping.

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APPENDIX C

Measurement and Results Concerning Coping Effectiveness in Experimental Studies

Study	Perspective	Was effectivity measured?	Options participants could choose from / were assigned at	Was media use effective?	Control group with no media use
Balantekin & Roemmich, 2012	SC	No			
Bowman & Tamborini, 2012	MM/ER	Yes	Computer games with varied levels of task demand	Yes (differently for levels of task demand)	No
Bowman & Tamborini, 2015	MM/ER	Yes	Computer games with varied levels of task demand	Yes (differently for levels of task demand)	No
Chang, 2006	MM/ER	Yes	Negative / positivly framed adversiting	Yes (for positive ads)	No
Fang Wang et al., 2018	MM/ER	Yes	Posts on WeChat with related / non-related pictures, no posts	Yes (non-related more than related, posting more than control)	Yes
Feng & Hyun, 2012	SC	Yes	IM Contacts online / offline	Yes (friends online more effective)	No
Ferguson & Rueda, 2010	MM/ER	Yes	No game, Nonviolent, violent games	Yes (only for experienced player)	Yes
Greenwood, 2010	MM/ER	No			
Greving & Sassenberg, 2015	Other	Study 3: Yes	Acquired information from 16 texts (memory not selection)	(No)	No
Iacovelli & Johnson, 2012	MM/ER	Yes	Self-disclosure / non-disclosue via FtF and IM	Yes, but FtF more physical stress reduction	Yes
Johnson & Knobloch-Westerwick, 2014	MM/ER	No			

APPENDIX C (continued)

Study	Perspective	Was effectivity measured?	Options participants could choose from / were assigned at	Was media use effective?	Control group with no media use
Johnson & Knobloch-Westerwick, 2017	MM/ER	Yes	Different SNS profiles (downward/ upward comparison)	Yes, for career-oriented upward comparisons	No
Kim & Oliver, 2013	MM/ER	No			
Kim & Tsay-Vogel, 2016	SC/ MM/ER	Yes	Different economic crisis stories (with victims, survivors, and outperformers as distinct targets)	Yes	No
Knausenberger & Echterhoff, 2018a	MM/ER	Yes	Either a loss-related sad or neutral video; Different icons to choose either Facebook, positive (sun) or neutral (Word) icon	Mixed (only belongingness not mood improved through facebook icon)	Yes
Knausenberger & Echterhoff, 2018b	Other	Yes	2 (Cyberball experience: ostracism vs. inclusion) x 2 (Icon presentation: Facebook vs. Word)	Yes (facebook icon improved need to belong for people with collectivist orientation)	Yes
Lee et al., 2015	MA/PMU	No			
Luong & Knobloch-Westerwick, 2017	MM/ER	No (no stress/ mood / emotion measure)			
Mares & Cantor, 1992	MM/ER	Yes	Differently valenced portrayals of old age (negative vs. positive)	Yes	No
Nabi, 2018	MM/ER	Yes	one of six versions of a television program (regret vs. no regret; lesson learned vs. acceptance; negative vs. positive extrinsic reinforcement)	Yes (program enjoyment = regret reduction)	No

APPENDIX C (continued)

Study	Perspective	Was effectivity measured?	Options participants could choose from / were assigned at	Was media use effective?	Control group with no media use
Nabi, Finnerty, Domschke, & Hull, 2006	MM/ER	Yes	2 versions of a TV program depicting cheating behavior (a young woman cheats on her boyfriend and then either self-blames/expresses regret or rationalizes her behavior)	Yes	No
Nishio, Taura, Sumioka, & Ishiguro, 2013	MM/ER	Yes	2 groups of participants, one with operating the robot and another without operating it	Yes (when an operator could effectively operate the robot, emotional states were affected by facial expression change)	No
Ossenfort & Isaacowitz, 2018	MM/ER	Yes	4 game choices (Two negative games and two positive games) and the opportunity to play as many games as they liked, for as long as they like and for a total of 10 minutes	Not reported (worse for older adults)	No
Panova & Lleras, 2016	SC	Study 2: Yes	3 groups: no decives, mobile phones, computer game	Yes (mobile phone access buffered feelings of stress)	Study 2: Yes
Pieschl, Porsch, Kahl, & Klockenbusch, 2013	SC	No			
Procci, Bowers, Wong, & Andrews, 2013	SC	Yes	Participants played game about mental health resources / coping skills with / without minigames that applied knowledge.	Yes (playing relevant minigames had positive learning gains)	No

APPENDIX C (continued)

Study	Perspective	Was effectivity measured?	Options participants could choose from / were assigned at	Was media use effective?	Control group with no media use
Reinecke et al., 2012	MM/ER	Yes	Game play with possibility to select demand level after false feedback (positive, negative)	Yes	No
Reinecke & Trepte, 2008	MM/ER	No (no stress/ affect measure)			
Rieger, Frischlich, Wulf, Bente, & Kneer, 2014	MM/ER	Yes	Groups: Pacman, watched gamplay video, waiting condition	Yes (for playing pacman)	Yes
Rieger & Hofer, 2017	SC	Yes	2 (mortality salience vs. control) × 2 (film ending: protagonist dies vs. protagonist survives)	Yes (surviving protagonist buffered against self-esteem loss for mortality salience)	No
Rieger, Reinecke, & Bente, 2017	MM/ER	Yes	movie clip with positive affective valence, movie clip with negative affective valence, control condition with no media exposure	Yes (both media conditions better than control)	Yes
Rieger, Wulf, Kneer, Frischlich, & Bente, 2014	MM/ER	Yes	participants were frustrated via a highly stressing math task and then played a video game (Mario Kart)	Yes	No
Roy & Ferguson, 2016	MM/ER	Yes	two game play groups (50 competitive, 50 cooperative)	Yes (stress levels declined over time at equal levels during both competitive and cooperative game play)	No

APPENDIX C (continued)

Study	Perspective	Was effectivity measured?	Options participants could choose from / were assigned at	Was media use effective?	Control group with no media use
Schneider et al., 2017	Other	Study 2: Yes	Facebook use/reading a text after need threat	No (no difference)	Yes
Schweizer, 2009	MM/ER	Yes	Study 1: TV viewing and waiting after aggression induction Study 2: TV viewing, Internet surfing or chat group after aggression induction	Study 1: Yes Study 2: Yes (Internet search > chat group > TV viewing)	Study 1: Yes Study 2: No
Till et al., 2011	SC / MM/ER	Yes	Different films of the genre dramas with a negative outcome	Yes / No (depending on measure, differences for reception mode)	No
Zhang & Zhou, 2018	SC	No			

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PAPER 2

Parental Mobile Media Use for Coping With Stress: A Focus Groups Study

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Note

Format, references, and spellings have been changed to be consistent with the other parts of the dissertation.

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Data Availability Statement / Supplemental Material

The complete interview transcripts can be received via mail when contacting the author. Many additional quotes in German and Englishas well as all material can be found here: https://osf.io/vw6ms/?view_only=88de73913d05434c8be9e3cd65c1bce8.

Ethics Statement

For the non-clinical setting, this research was approved by the ethics committee of the Leibniz-Institut für Wissensmedien, Tübingen, Germany (LEK 2018/011) and for the clinical setting, this research was approved by the medical ethics committee of Ethics Committee at the medical faculty of the University of Tübingen and the University Hospital Tübingen (Project-Nr. 596/2018). All participants signed an informed consent about participation in the study and agreed to the recording of the interviews.

Abstract

Mobile devices are deeply integrated into the everyday lives of families and provide direct access to many resources in stressful situations. By proposing that mobile devices might be fitting tools for parental coping, this study connects work on mostly beneficial parental Internet use with work on detrimental effects of device use on the parent-child interaction. The results of five focus groups conducted in a clinical and a non-clinical context show that parents use their mobile devices to seek information, actively cope, distract themselves, and seek social support when confronted with stress. Immediacy, quality, self-assurance, and successful self-regulation emerged as factors that determine stress coping effectiveness. Parents indicated strong norms against device use while parenting which could influence successful coping with stress but also protect against negative effects on parent-child interaction.

Parental Mobile Media Use for Coping With Stress: A Focus Groups Study

Parents of young children experience major changes in their lives and in different stages of the development of their children, they are exposed to stressful and highly demanding situations (Barclay et al., 1997). Increased parental stress levels were shown to be related to negative consequences for child development (Bakoula et al., 2009; Crnic & Greenberg, 1990). Thus, effective parental stress management is not only important for the parents' wellbeing but also an influential factor in the development and wellbeing of children (Deater-Deckard, 2004).

Smartphones and other mobile media devices now are part of the everyday lives of many people and have also entered the daily lives of parents and children (Chaudron et al., 2015; Wartella et al., 2014). Smartphones can be seen as metamedia (Humphreys et al., 2018) because they can be flexibly used for a multitude of tasks including different opportunities for coping (Hoffner & Lee, 2015; van Ingen et al., 2016). Furthermore, smartphones are effortlessly accessible at all times and can be used for short time intervals in a meaningful way, which differentiates them from other media such as television, newspapers, or laptops (Oulasvirta et al., 2012).

Parents of young children often perceive themselves to be in a state of isolation (Barclay et al., 1997). One of the reasons for the feeling of isolation is that with small children it has become more difficult to leave the house and meet people who are in a similar situation (Parry et al., 2013). An increased required effort to leave the house should make easily and always accessible options for coping with stress attractive (Lupton et al., 2016). Parents of young children also experience a "loss of time" (Barclay et al., 1997, p. 724), highlighting the value of tools that can be used for short time intervals. Finally, as the flexible adaptation of coping strategies to the particular demands of a situation is a key predictor of effective stress management ("regulatory flexibility," Bonanno & Burton, 2013), tools that can be used for multiple coping strategies might often be preferred. Thus, smartphones seem to be suitable tools for the parental management of stress.

It is, however, still unknown how parents use smartphones and other mobile media devices for their stress management and whether this use is effective (Coyne et al., 2017). The growing research field on parental phone use has focused on negative consequences of parental phone use on, for example, maternal sensitivity or responsiveness (Vanden Abeele et al., 2020; Wolfers et al., 2020) and the parent-child interaction (Hiniker et al., 2015, for an overview see McDaniel, 2019). Research on parental Internet use has rarely used a stress management perspective and has only recently begun to focus on mobile device use (Coyne et al., 2017; Lupton et al., 2016).

In this paper, I outline the findings of five focus group interviews conducted with a diverse sample in a clinical and a non-clinical setting. After introducing the transactional model of stress and coping as a basic framework, I will shortly review the two different research lines on parental Internet and device use whose findings are relevant for studying parental mobile media use for stress management: research on parental use of the Internet for parenting on the one hand and research on parental use of mobile devices while parenting on the other hand. The link between these research lines serves as groundwork for the research questions and for interpreting the findings. The aim of this paper is, therefore, to contribute to first insights into the use and effectiveness of mobile devices for parental stress management and to connect two research traditions that have so far studied the effects of parental phone use rather independently.

The Transactional Stress Model, Parental and Parenting Stress

Lazarus and Folkman (1984) define stress as a transaction between a person and a situation in which the demands that are placed on an individual exceed the individual's resources. Parenting stress, more specifically, is defined as the stress that is directly related to the parenting role (Deater-Deckard, 2004). However, as it has been shown that stress experienced in other life domains (e.g., work) can also influence the parental stress level (Repetti & Wood,

1997), I will focus on all stressful situations that arise while parenting without focusing singularly on parenting stressors.

According to the transactional model of Lazarus and Folkman (1984), individuals assess a potentially stressful person-situation transaction in a first appraisal as a challenge, a harm, or a loss. In a second appraisal, individuals evaluate the options they have to cope with the stress. These options have been divided into various coping strategies, which can be defined as "objectives or intents of coping responses" (Compas et al., 2001, pp. 88–89). In their model, Lazarus and Folkman (1984) differentiated between problem-focused coping, that is, the attempt to solve the stress-evoking problem, and emotion-focused coping, where coping is directed at the emotions that have been evoked through the stressful transaction. Later, more detailed classifications of coping strategies have been introduced including, for example, active coping, information seeking, self-distraction, humor, and social support (for an overview, see Skinner et al., 2003).

In addition to coping strategies as one form of coping options, Wolfers and Schneider (2020) argue to conceptualize coping tools, including media devices, as an additional dimension of coping that can be combined with different coping strategies. Referring to this view, a specific combination of coping tools and coping strategies is chosen in a particular situation. It was both theoretically hypothesized and empirically shown that the effectiveness of coping options cannot be judged uniformly for every person-situation transaction (e.g., problem-focused coping is not always better than emotion-focused coping, Deater-Deckard, 2004). Instead, the effectiveness of coping strategies and probably also coping tools depend on their fit to the person-situation transaction at hand (for an overview see Bonanno & Burton, 2013). Following these theoretical considerations, I investigate in this study with which coping strategies parents combine mobile media and the circumstances under which mobile media is successfully used for coping with stress.

Parental Use of the Internet for Coping-Related Purposes

Although few studies assess parental mobile device or Internet use from a stress management perspective (Coyne et al., 2017), multiple studies suggest that parents utilize Internet resources and mobile devices for coping (Radesky et al., 2016). Parents are shown to use services like parenting websites, blogs, and social media to give and receive emotional as well as instrumental social support in response to negative experiences (Drentea & Moren-Cross, 2005; McDaniel et al., 2012). Parents perceive these platforms as an empowering place where they can "normalize" their experiences in comparison to honest reports from other parents (Brady & Guerin, 2010; Hall & Irvine, 2009; Madge & O'Connor, 2006). Moreover, it is widely studied that parents use Internet resources to search for information (Daneback & Plantin, 2008; Dworkin et al., 2013). This use also happens in stressful situations such as when their baby is experiencing acute illness symptoms (Bernhardt & Felter, 2004).

Although most studies focus on social support and information seeking behavior (Dworkin et al., 2013), parents also use digital content for purposes related to additional coping strategies. For example, in a content analysis, Amaro et al. (2019) show that mothers express negative emotions on social networking sites, corresponding to the strategy of venting emotions (Carver et al., 1989).

Concerning the *effects* of using Internet resources, most studies on parental Internet use paint a positive picture (Brady & Guerin, 2010; Dworkin et al., 2013). As a result of a literature review, Lupton et al. (2016, p. 737) concluded that parents perceive digital media "as a way of alleviating feelings of isolation, boredom, loneliness, anxiety or uncertainty about caring for and protecting children" and thus, as "very valuable." Therefore, the use of digital media services might effectively reduce parental stress. However, unsuccessful usage of digital media services in alleviating parental stress has also been reported. For example, upward social comparisons on social networking sites have been shown to lead to increased levels of

role overload (Coyne et al., 2017). Furthermore, parents report struggling to evaluate the reliability of online information (Bernhardt & Felter, 2004; Dworkin et al., 2013). Although these studies on positive and negative outcomes of media device use do not focus on stressful situations, they do hint towards a diverse set of factors that might influence whether phones can be utilized for effective coping.

In sum, there is extensive literature on social support and information seeking but other strategies have not received the same level of attention (see the topics which emerged in the reviews of Daneback & Plantin, 2008 and Dworkin et al., 2013). Additionally, although mobile devices are frequently used (Barr et al., 2020; Yuan et al., 2019) and stressful situations are common while living with small children (Crnic & Greenberg, 1990; Deater-Deckard, 2004), the use of mobile media in stressful situations has not been studied (Coyne et al., 2017). With this study, I aim to close this research gap and to answer the following questions:

RQ1: For which coping strategies do parents use their mobile devices?

RQ2: Under what circumstances is parental stress management with mobile devices successful?

Mobile Phones as Social Pollution? Negative Effects and Evaluations

In contrast to the positive picture painted by the literature on Internet use for parenting, the growing field of research on phone use while parenting mainly examines detrimental effects (see e.g., the review by McDaniel, 2019). By distracting from or interrupting parent-child interactions, parental mobile phone use has for example been shown to be related to less parent-child interaction, lower maternal sensitivity, and problematic child outcomes (Hiniker et al., 2015; Lemish et al., 2020; McDaniel & Radesky, 2018; Wolfers et al., 2020). Davidovitch et al. (2018) see mobile phones as "social pollution" (p. 35) and even suggest a relationship with a child's development of an autism spectrum disorder. Parents are aware of these negative evaluations (Livingstone & Blum-Ross, 2020), which have been popular topics discussed by media outlets (Christakis, 2018), cartoons (Leunig, 2019), and campaigns (Drug

Commissioner of the German Government, 2017). Thus, norms and general evaluations on mobile device use while parenting could also play a role in the stress management process. Within this paper, I define norms as "the amount of pressure that people perceive they are under from significant others to perform or not to perform a behavior" (White et al., 2009, p. 138). Evaluations of others might influence whether parents judge their mobile device as beneficial or detrimental for and while parenting, also when phones are used for coping. Following this reasoning, I will additionally assess:

RQ3. a) How do parents evaluate their mobile device use, b) How do parents appraise the mobile device use of other parents, c) How do parents perceive other people's evaluations of mobile device use while parenting?

Method

To answer these research questions, five focus group interviews containing a total of 19 participants were conducted. Groups of parents were interviewed in Germany at two different institutions, at the Leibniz-Institut für Wissensmedien Tübingen located in a middle-sized town and a parent-child health retreat clinic in a rural area. Parents were asked to discuss questions concerning perceptions and evaluations of their personal and other parents' smartphone use. This study focuses mostly on mothers as they are still responsible for a large part of the child care in Western societies (Craig & Mullan, 2011; Peuckert, 2012). The study was approved by the ethics committee of the Leibniz-Institut für Wissensmedien and, for the clinical context, by the medical ethics committee of the University of Tübingen.

Procedure

Before taking part, participants were asked to read information about the study and give their consent. They were then asked to complete a pre-survey on demographics such as age, their children's age, and their level of education. For reasons of data protection, concrete statements were not assigned to specific data from the pre-survey and were interpreted independently of the individual. The interview followed the episodic interviews method that focuses on the description of situations in everyday life (Flick, 2000). After general questions

about typical stressful situations and general coping strategies were discussed, participants were asked to describe and discuss situations that included coping with stress via mobile devices. In the end, general evaluations of phone use while parenting were discussed. Participants were asked about situations in which they saw other caregivers use their phones. Additionally, participants described how they perceived others have evaluated the participants' mobile device use while parenting. Each participant received a remuneration of 20 Euros at the end of the focus group interview.

Participants and Interview Setting

In total, 19 participants were interviewed. Following a purposive intensity sampling strategy (Robinson, 2014), a "high-stress" sample and a "usual-stress" sample were recruited. The high-stress sample included parents who were suffering from particularly stressful circumstances for which they visited the parent-child health retreat clinic. The usual stress sample included parents who we assumed were exposed to average stressful living conditions because they were recruited from the parenthood of a medium-sized city. The first three interviews, representing the usual-stress sample, were conducted in Tübingen, a middle-sized university city in Germany (US 1–3). Participants were recruited through personal contacts, notices at childcare centers, and pediatrician practices. The participation criterion was to have a child younger than 7 years. Eight participants took part. Five of the mothers had two children and three had one child. The average age of the children was 1.5 years (*SD* = 1.2 years, range: 0–3 years). Five mothers did not work, two worked part-time, and one worked full-time. One mother was a single parent. Three mothers held a university degree, four mothers had finished high school, and one did not give information about her educational background.

In the second set of interviews, parents were interviewed at a parent-child health retreat clinic, representing the high-stress sample (HS 1–2). In parent-child health retreat clinics in Germany, parents and their children can recover from stressful life circumstances (e.g., health problems of parent or child) and receive training on how to cope with stressors of their

everyday life. Such retreats are paid for by the German health insurances. Two focus groups with a total of 11 parents were conducted. Participation was open to all current patients of the clinic. Ten mothers and one father took part. The age spectrum of the children was broader than that of the usual-stress sample (1–4 children per parent, 29 children in total; Age: *M* = 7.1 years, *SD* = 4.0, range 1.5–17 years) but the youngest child of each participant was under 8 years old. Three of the parents worked full-time, seven worked part-time, and one was currently unemployed. One mother was a single parent and one was living with a new partner. Five of the participants held a university degree, two had finished high school, three had finished extended secondary school (German "Realschulabschluss"), and two had finished secondary school (German "Hauptschulabschluss").

Analysis, Codebook, and Coding

All interviews were transcribed and a structuring content analysis was conducted (Mayring, 2014). Categories of the content analysis were first deductively derived from the literature and then inductively supplemented from the interviews following the procedure of a directed content analysis (Hsieh & Shannon, 2005; Mayring, 2014). I trained two Master-student assistants according to the first version of the codebook. Both coders and I then completed an iterative process of test coding followed by an adaptation of the codebook. After the test coding phase, all interviews were coded independently by the two coders using the software MaxQDA (VERBI Software, 2019). In a next step, their coding was compared using the comparison tool of MaxQDA. If the categories assigned to a text passage differed between the codings of both coders, I discussed the text passage with both coders. Both explained why they had assigned, for example, the coping categories venting or emotional social support, respectively, to a particular text passage. These reasons were compared with the codebook, discussed, and a decision was made jointly, for example, for one or both strategies of venting and emotional social support. If necessary, the codebook was concretized corresponding to the decision (see the procedure of Scheufele et al., 2019).

The final codebook contains categories concerning stress coping strategies, the content of mobile device use (e.g., social network sites), and statements about evaluations of and from other parents. The "coping strategy" category as a central category was first adapted from the COPE questionnaire (Carver, 1997) and then updated through the material (e.g., an information-seeking category was added). Every time a coping strategy was coded, it was coded whether the strategy was pursued with or without a mobile device and whether the coping was described as successful, unsuccessful, or partially successful. The codebook in English and German, additional quotes from the interviews for each of the results, and the original quotes in German can be found here: https://osf.io/vw6ms/?view_only=425fc1 aef5cf49d283e07c2a5492472f. In addition, a text delineating the differences between the two samples can be found in the OSF file. To construct themes for the most discussed coping strategies, I read all text passages which were coded with a certain category multiple times and noted similarities and conflicts in an iterative process. The recurrent and salient themes developed in this last step are presented in the following section.

Results

How Do Parents Use Mobile Media for Coping With Stress?

My first research question asked how parents use their mobile devices for coping with stress. When asked about their mobile device use in stressful situations, most participants responded not to use their smartphones to cope with stress:

> I never use it to de-stress as it never de-stresses me. (HS1)

> But not to lower my stress level, not at all. (US3)

However, when participants described situations in which they used their devices or when parents were asked questions about specific coping strategies, coping via phone use was frequently indicated (see Table 1). For some coping strategies, mobile devices were of particular importance. The strategies described most often and in most detail were information seeking,

self-distraction, active coping, and instrumental as well as emotional support. I will now briefly introduce the main themes that emerged for each of these strategies. As non-phone mobile device use was only described once, I will use "phone" and "mobile device" interchangeably.

Information seeking was described most often corresponding to the role this strategy played in previous research. Parents described seeking information for questions of child health, development, and education.

> And if it's more like something for which I think: "Is that normal, has it something to do with the development and how do I deal with it?" When suddenly [name child] had nightmares. Then I google: Three-year-old child has nightmares, fear of monsters, and then what does that mean? (HS2)

> Then just this stress with an unclear illness for example on the weekend or so which simply does not let go of me because I see the child or the symptoms and just do not want to go straight to the clinic. Then, I just google. (HS1)

Device applications mainly used for information seeking consisted of search engines and parental websites, such as blogs, forums, and professional websites. Alternatively, some parents also indicated using books but for most parents, the accessibility of Internet resources makes them the preferred source for immediate information in stressful situations.

> Of course, you have books, but I must honestly say that it is actually easier for me to use my mobile phone. (HS1)

> It is the first impulse: I now look on the Internet, whether I find something. (US1)

The second-most frequent coping strategy observed was self-distraction, often pursued via the use of a mobile device (see Table 1). Parents used a wide variety of applications for distraction, such as social networking sites, mobile games, and other mostly hedonic entertainment content (e.g., websites of women's magazines). An emergent topic was the theme "phone use when having some time for myself." Parents claimed to use their phones to experience alone-time when their children were occupied or to signal to their children that they needed time without distraction. Mobile devices, therefore, served as a source of disconnecting from the

Table 1

Frequency of Codes of Stress Coping Strategies and Their Effectiveness With and Without Mobile Media

	Frequency of categories			Effectiveness rating when used with mobile phone**		
	Total	With mobile media	Without mobile media	Effective	Partially Effective	Ineffective
Information seeking	58	53*	10*	26	13	12
Self-distraction	48	42	8	28	3	6
Active coping	41	19	28	15	1	0
Instrumental support	40	18	24	9	2	2
Emotional support	28	23	8	16	5	0
Relaxation	18	5	14	3	0	0
Planning	13	2	10	1	1	8
Acceptance	11	2	8	1	1	0
Positive reframing	8	1	7	1	0	0
Behavioral disengagement	6	4	2	1	0	1
Venting of emotions	3	3	1	3	0	0
Self-blame	3	0	3	0	0	0
Humor	2	0	2	0	0	0

Note. Categories were taken from Carver (1997) and inductively adapted from the material. The categories denial, religious coping, and substance abuse were not described by the participants. *Participants sometimes described several coping behaviors in one statement.
** Not all statements included an effectiveness rating.

situation and a possibility to experience autonomy and alone-time for a short period. Mobile phones were described to offer access to a state of solitude when the need for alone-time or autonomy could not be otherwise fulfilled.

> Just quickly look at pictures, maybe write to a friend, and then you're back: Ah I had 5 minutes for myself, now I have strength for you again. (HS2)

> I sometimes feel the use of the phone as a time out for myself. (US1)

> Then, I withdraw myself from the situation and take a quarter of an hour – and the children know that, too. They know: Okay, mom sits down and has her cell phone and they shouldn't talk to me. And that's okay for them, they accept it and that's when mom is really on her own. (US1)

Active coping, defined as "the process of taking active steps to try to remove or circumvent the stressor or to ameliorate its effects" (Carver et al., 1989, p. 268), was also reported. However, the percentage of active coping which included mobile devices was considerably lower than for self-distraction and information seeking. This implies that active coping is important for parents but that mobile devices as coping tools fit this strategy in fewer situations. Situations that involved active coping using mobile devices are characterized by a multitude of stressors and usage patterns. This is not surprising since active coping is closely aligned with the problem that has caused the stress (Carver et al., 1989). For example, parents reported using their phones to manage their everyday lives but also to use video platforms like YouTube to find videos for training or yoga.

> I also had massive back problems a little more than a year ago. I could hardly move anymore. And then I looked for special exercises and actually used YouTube. (HS1)

The fourth and fifth most often described coping strategies were instrumental and emotional support, respectively. Both strategies were employed in combination with mobile device use. However, as can be seen in Table 1, mobile devices were more important for emotional than for instrumental support. Both categories of support were aligned with the use of calls and instant messengers but much less with the use of social networking sites.

For instrumental support, parents reported calling, messaging, or personally talking to another individual (e.g., other parents, doctors, teachers) when they were unsure how they should respond to a stressful situation. In addition to using mobile phones, parents also considered personal offline conversations to be important. Conversations via calls were indicated more often than text messages.

> And if something is urgent, I'd rather have a personal conversation. Either in daycare, at school, or with a mom, if there is something up, I'd rather talk. (HS2)

> Depends on how urgent it is. If my child has a rash in the crook of her arm, I send a voice message, like: "Hey, you learned something with dermatology: Here, take a look at this." But if it's very urgent, I'd also call. But then I wouldn't call friends of mine who are the same age, but rather the father of a friend of mine, who is a pediatrician. (US3)

Emotional support was sought via both calls and instant messengers. Participants used their devices to reduce feelings of loneliness and to experience reassurance from other parents. As described in previous studies, "normalizing" their experience was important for participants who sought emotional support (Brady & Guerin, 2010; Hall & Irvine, 2009). Parents discussed the advantages of using instant messengers to communicate immediately in stressful situations with people who lived far away or were busy.

> So if it's a really silly situation, where you as a mother have the feeling of total failure, which I then find very stressful, then getting help from my network – that helps a lot. When you get emotional again and others [in a chat group] describe that they have had the same experience or explain how to get out of it. (US2)

In sum, although parents first indicated that they did not use their phone for coping with stress, in the discussion with the other participants, parents reported using their mobile phones for coping purposes such as for information seeking, self-distraction, and emotional and instrumental support. Active coping was a prominent strategy, but less often pursued using a mobile device. Additionally, parents indicated giving their phones to their children when confronted with a stressful situation. A description of this use can be found in the OSF folder.

How Effectively Do Parents Describe Their Mobile Device Use? What Influences Successful Mobile Device Usage?

In the second research question, I asked under which conditions mobile devices are effectively used for coping (see Table 1). In general, parents described many situations in which their mobile phone use was experienced as successfully reducing stress. However, mobile devices seem to be used more successfully for some strategies than for others.

As can be seen in Table 1, phone use for information seeking was often, but not always, successful in reducing stress. Participants, in particular, discussed one important condition for stress-reducing information seeking: information that bolstered existing beliefs reduced stress, while belief-inconsistent information was experienced as ineffective coping. This was true for both questions of health as well as of parenting.

> On a website, I just read the first two paragraphs and then I think: "Nope" and then something else comes along that suits me better. And there I can consume what suits me better, as a kind of self-affirmation. (US3)

> If it [information accessed via Google] confirms clearly what I already thought anyway – then, of course, it is a reassurance and the subject is closed. Or if it also brings other aspects into it, "It could be one or the other" and then I think "Oh God" - now I have to think about it – and then it brings more disturbance into it. (US1)

> So you get through Google already the information you already wanted or which you already intuitively felt. (US1)

Participants described that they actively work towards being reassured by purposefully selecting content that fits their attitudes or intuitions. Selective exposure might therefore be a process that is important for the stress-reducing use of mobile devices for information seeking.

For self-distraction, parents mainly described that they experienced having 5 min to themselves as effective stress management. Using a phone to experience a brief period of alone-time helped parents to disengage and recover from stressful situations.

> My card game helps me in these cases [stressful situations]. It's quite simple, really. And then I somehow know, okay tails on tails, color on color and this card fits this one … everything is in my head, a thousand things everywhere; and then I can concentrate on two or three things and I think that brings me down. (HS2)

> So if I'm incredibly stressed out, it's enough to just sit down and look at my mobile phone and read something, and then it is all right again, then I can let it be. (US1)

Some parents also described that they perceive alternative coping tools, such as going for a walk or yoga, as more successful than using phones because the induced relaxation was experienced as deeper and more persistent. Parents, however, also discussed the factors of effort

and practicability. Using a mobile phone for self-distraction might therefore be a way to regulate stress and emotions in situations in which more effortful coping is impossible.

> For example, when I go to the gym, do yoga or something like that – or actually read a book. Then I relax on a deeper level as if I am in bed in the evening again 'in' my mobile phone, I am less deeply relaxed I would say. (US3)

> Yes, the problem is that it is not always possible to implement this because of time constraints. So my thing is, I would just go jogging, but jogging always takes an hour. (US1)

Mobile phone use was, however, only effective when parents managed to successfully regulate the length of their phone use. Parents described that they are sometimes too absorbed by their phones and then use it longer than intended. To avoid this, parents indicated that they deleted phone applications. The ability to regulate phone use, therefore, does not only include situational self-regulation but also includes the ability to configure the phone's applications to support situational regulation.

> For me, this is the case, that I tell the kids "Oh, I need some rest, I need a break"… And then I kind of catch myself 20 minutes later: I'm lying on my bed looking at my Facebook news feed and it just feels really pointless. (HS1)

> So when my son was younger, that was a very, very exhausting time for me – and I sometimes used the smartphone to take a break, a break that was completely focused on me. I would let my child play and then go to the toilet and scroll through something just to calm down. But then I noticed that it stressed me even more and that I felt the need to do that even more. And that's why I stopped it, that's why I don't have any apps on my mobile phone anymore, with which I can do something like this. (US3)

For instrumental support, parents mostly relied on judgments of experts and preferred to telephone or personally visit the individual they wished to contact, such as a doctor or their child's teacher. Often, these actions indicated that parents prioritized the quality of the information they sought, as immediate access to these experts was not always available.

> I prefer to use personal contact. Maybe both the daycare teachers and the school teachers. In the worst case, a psychologist … there you usually have the better answer. (HS2)

For emotional support, in particular, parents described using their phones when they needed social support right away. In these cases, the immediacy of seeking social support seemed to matter to a special degree.

> And then I had two girlfriends with whom I wrote WhatsApp messages, which was really helpful at that moment because then I could always send a cry for help when things were tight and there was always some encouragement. (HS1)

Comparing the statements on the strategies information seeking, instrumental support, and emotional support, interesting differences emerged. For instrumental support, parents indicated to mostly rely on experts and to wait until it was possible to speak with them. Thus, instrumental support seems to be directed toward quality. For emotional support, the immediacy of support was described as important. Similarly, information seeking was described as a "first impulse" and again, the immediate use seems to be crucial. This does not mean, however, that websites chosen for information seeking, are not also selected according to the expected quality or that instrumental support is not most valuable when received immediately. However, the importance of these factors seems to differ between the different coping strategies. Parents reported using mobile devices more frequently to seek information and to seek emotional support for the fulfillment of the immediate need for information and support, while instrumental support regardless of device use served as an avenue to obtain high-quality information.

To summarize, parents reported effective use of phones for coping, however, effectiveness depended on several factors including the immediacy with which a coping option was available, the confirmation of existing beliefs provided by the coping option, the quality of the received information or relaxation experience, and the individual's ability to self-regulate their phone use.

Evaluations About Device Use While Parenting

In my third research question, the focus lies on evaluations of parental phone use by the parents themselves and by other people. When examining the evaluations of parents' own

phone use, there were two different patterns of evaluations. In the first pattern, parents evaluated their phone use as too long and too much and reported on usage patterns they saw as addictive.

> So, when I think of my smartphone, I think, "Oh I wish the world back before smartphones'. It's really stressful for me. It's like a wedge has been brought into my life, this thing and I have an addictive nature and it's just got me in its claws. (HS1)

Conversely, in the second pattern parents reported that their mobile devices facilitated their everyday lives by being "handy." This included situations in which the mobile phone was used for effective stress management, but similar evaluations were also made on a general level.

> For me, this really is a facilitation [of everyday life] and I also try not to be too strict with my mobile phone use. (HS1)

Thus, evaluations about parent's own use seem to be divided into positive and negative evaluations. When looking at evaluations "from the outside," the balanced picture of positive and negative evaluations, however, changes. Parents described that others (e.g., family or strangers) mostly think the participants should use their phones less. In one instance, a mother described that she was approached by a stranger for using her phone.

> And I had a situation the other day where I was grumbled on by a woman because I had my mobile phone stuck on my ear and had to lift the stroller out of the bus. … I hear this: 'Oh the mothers of today, always with their mobile phone' and I just thought 'Oh my God.' And at that moment, I was suddenly the one that I always think about: "Why do you use your phone now?" (US1)

Similarly, participants mostly judged other parents' phone use negatively. One mother described approaching strangers when she thought their phone use interfered with parent-child interactions, while other participants used very negative wording for judging other parents' phone use.

> On the bus, a mother with a child started to act out and she then just started to call out the child but she didn't really interact with the child as she was busy with the mobile phone.

> And that makes you wonder. And you judge so quickly and think: 'Wow, that looks so antisocial'" (US1) [in everyday German "asozial," English antisocial, is used as a very negative word for individuals that are considered to act against norms or look neglected.]

> I sometimes think: Can't she put away her mobile phone and just go for a walk with her child? (US1)

These negative evaluations show that there are quite strong norms in play when it comes to phone use while parenting. Regarding statements that were coded as "neither positive nor negative," an interesting difference emerged.

> So this double standard. When you are on the outside, then it [mobile phone use] seems to you to be a lot and when you are obviously on the inside, then it is all quite normal. (US1)

Participants discussed that there is a difference between their own situational experience of mobile phone use, which is experienced as normal, and the image of another parent using a mobile device, which is perceived as "weird" by an observer. In the literature on mobile communication, the use of mobile devices is described as something that has become highly habituated and is now "taken for granted" (Ling, 2012). However, this taken for grantedness does not seem to persist for observers of phone use in the normatively loaded context of parental phone use.

Concerning my third research question, I found that parents viewed their own phone use in a differentiated manner but assessed the use of other parents as clearly negative. This suggests that there are strong norms against the use of phones while parenting, but that at the same time personal phone use is taken for granted.

Discussion

The objective of this study was to provide a first closer look at how parents use their mobile devices for stress management and to provide insights about the effectiveness of using phones for coping with stress. Additionally, this study investigated the role of norms in this context. The results show, that when parents use their devices to cope with stress, they mostly do so for information seeking, active coping, social support, and self-distraction. Furthermore,

immediacy, self-assurance, quality, and self-regulation are important factors for effective device use. However, the results point out several incongruities in the perceptions and evaluations of parents which provide important avenues for future research. I will elaborate on these two sets of findings in the following and evaluate them against the background of previous literature and the study's limitations.

Concerning the strategies that mobile devices were used for, the importance of information seeking and social support resembled the findings of previous research (Drentea & Moren-Cross, 2005; Plantin & Daneback, 2009). The present study's results show that these usage motives are also important in stressful situations. Self-distraction and active coping, however, have not been investigated systematically by previous studies. The strategy of self-distraction provides an especially interesting starting point for future research. Mobile devices were used by the participants for the immediate but short fulfillment of the needs for solitude or autonomy. Previous work on parental phone use has only briefly mentioned this usage pattern (Lupton et al., 2016; Radesky et al., 2016). A comparable pattern of mobile phone usage to experience short breaks has been examined in the work setting (Rieger et al., 2017). Rieger et al. (2017, p. 165) argue they "see the opportunity to autonomously choose an activity tailored to personal and situational needs as a strong argument for a recovery-supporting function of the smartphone." In the situations described by the parents, the need for alone-time or solitude (Buchholz, 1997; Leung, 2015) might be threatened. Due to the ability of mobile devices to enfold hybrid spaces, "remote contexts inside the present context" (de Souza e Silva, 2006, p. 262), parents might fulfill this need for alone-time at least in the short term by using their mobile phone.

Several factors for the effective use of mobile devices for stress management emerged, but they were of varying importance for different coping strategies. First, the effectiveness of phone use for coping with stress depended on the immediacy on which resources were accessible. This was important for information seeking, self-distraction, and emotional support, but

less important for instrumental support. Second, the quality of information (information seeking, instrumental support) and of the recovery experience (self-distraction) was important overall, but was most important for the strategy of instrumental support. If possible, parents tried to maximize both the immediacy and the quality factor such as immediately receiving high quality support in stressful situations or finding a self-distracting activity that allows for an immediate "deep" recovery experience. However, the maximization of both factors, especially in a parenting context in which possibilities are limited by the simultaneous responsibility for children, is often impossible. The decision in the resulting trade-off depends on the strategy, situation, and the involved individuals.

Mobile devices are coping tools that mainly maximize the immediacy factor by being constantly available. Achieving the factor of quality seems to be more difficult with mobile devices. In this study, I focused on situations and situational factors rather than on individual characteristics. This study has therefore only touched upon the skills individuals need to achieve a high quality of credible information or relaxation experiences while using mobile devices. Thus, future studies should focus on these skills as they might be of particular relevance for interventions that promote the beneficial use of phones in the family context.

Third, the possibility to find self-assurance emerged as an important factor mostly for information seeking but also for the two support strategies. Parental reassurance-seeking online was similarly described in previous studies (Bernhardt & Felter, 2004). It is important to note that my understanding of successful stress management in this manuscript refers to the reduction of feelings of stress. I do not assess the objective quality of a decision. In certain cases (e.g., the decision about vaccination see for example Meppelink et al., 2019), this selective exposure pattern might be a problem, especially because the experienced stress reduction might be perceived as a reward that can increase selective exposure in future stressful situations.

Fourth, the self-regulation of mobile device use itself emerged as an important factor. The ability to successfully regulate phone use includes being able to regulate the duration of phone use in the situation and the ability to configure the mobile device in a way that facilitates such situational self-regulation. This finding aligns with the results of the interview study of Radesky et al. (2016) for the parenting context and with findings on regulating mobile device use in general (Halfmann & Rieger, 2019).

All four factors have already been at least briefly discussed in previous literature but have not been integrated and tested for their interrelations. As the context of this qualitative study was limited to a small number of participants in only two settings and one culture, it is important to test their importance for parental stress management for a larger number of participants in various settings also utilizing quantitative designs.

In addition to the effectiveness factors, the parents' statements showed several incongruities. First, while parents reported on a general level to not use their mobile devices for stress management, on a situational level, phone use for coping purposes was frequently described. Thus, individuals seem to connect mobile device use to situational motives rather than the feeling of stress in general. This might be a sign of deep integration and taken-for-grantedness of mobile devices in these stressful situations (Ling, 2012). In any case, this finding underlines the importance of measuring mobile device use for coping purposes shortly after a situation or by using tracking techniques.

The second incongruity emerged between the many instances in which successful coping with mobile devices was reported and the negative norms associated with parental phone use. Parents themselves reflected on the difference between the feeling of normality while using their phone and the feeling of strangeness while observing device use while parenting of other parents. The habituation of devices, therefore, seems to be true for individuals themselves but seeing parents use their phone seems not to be taken for granted in a similar vein. This

is an interesting finding for research on the integration of mobile devices in everyday life, suggesting that the observer and the user show different levels of habituation.

The strong norms found in this study differ from the results of the interviews with US-American parents of Hiniker et al. (2015) in which feeling judged for using the phone while parenting only emerged as a minor theme. This difference might be grounded in cultural differences and the strong norms found in this study might be specific for the German or the European context.

For research on parental phone use for stress management, these strong norms are important to consider because they might interfere with the success of stress management. For the non-parental context, Reinecke et al. (2014) showed that the success of self-regulation or coping via entertaining media content depends on how self-regulating behavior is appraised by the individual. When the behavior is experienced as self-control failure and elicits guilt, recovery experiences are not as successful as when guilt is not elicited (Reinecke et al., 2014). The authors argue that these effects occur because media use is perceived as less "culturally valuable" (Reinecke et al., 2014, p. 583) than other leisure activities. This should be especially true in the value-laden context of parental phone use, suggesting that negative norms might hinder the positive effects of parental mobile device use. The present study's results should, however, be interpreted against the backdrop of the negative effects of parental phone use on parent-child interactions reported by previous studies (see McDaniel, 2019 for an overview). Thus, the negative norms found in this study could also function as a protective factor against the negative effects on families. Exploring the effects of norms in the context of parental phone use therefore appears to be a particularly important avenue for further research.

Conclusion

This study is the first to assess parental mobile device use from a stress management perspective. The results show that parents use their mobile devices to regulate stress and that

this use is often, but not always, effective. Several factors (i.e., immediacy, quality, self-assurance, self-regulation) for successful use were identified. I found that parents experience and report strong norms against phone use while parenting. These norms could hinder successful phone use for coping but could also protect against overuse. By integrating norms and usage motives, this study bridges previous research on the negative effects of parental phone use and the positive effects of parental Internet use. These two research lines have emerged independently but would each benefit from deeper integration with one another. Given the mix of positive and negative effects of parental phone use found in this study and in previous research, it seems crucial that parents learn to use their devices in a way that increases the benefits while decreasing the negative consequences. This study serves as groundwork for both future research and interventions on beneficial mobile device use in the family.

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PAPER 3

Situation-, Person-, and Device-Specific Factors When Mothers Use Their Smartphones for Coping With Stress

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This paper will soon be submitted.

Open Science Statement / Supplemental Material

Supplemental material, data, and code for this article are available through OSF (https://osf.io/aw2kd/). The study has been preregistered at https://osf.io/v8y9f/?view_only=5c992e01ad5b4974963211187e302733.

Ethics statement

This research was approved by the ethics committee of the Leibniz-Institut für Wissensmedien, Tübingen, Germany (LEK 2020/047). All participants gave informed consent to participate in the study and agreed to the sharing of their anonymized data.

Abstract

Smartphones are omnipresent in the daily lives of many parents and provide easy access to different kinds of resources directly in stressful situations. As such, smartphones might be valuable coping tools. In the present study, we examined which situation-, person-, and device-specific factors impact whether mothers of young children use their smartphones for stress coping and whether their phone use for coping is effective. Building on a one-week experience sampling study with over 200 mothers, we found that in stressful situations while being with their children, mothers used their smartphones primarily for emotion-focused coping strategies such as self-distraction. With lower prevalence, smartphones were also used for problem-focused coping. Mothers who reported a higher cognitive salience of phones used it more for coping. Physical phone salience, phone personalization, situational urgency, control, and importance did not significantly predict phone use for coping. Phone use for coping was significantly related to a lower stress decrease compared to no use, but using positive phone content was related to increased perceived coping efficacy. Person-specific (phone use self-regulation skills), device-specific (personalization, semantic affinity, and valence of phone content), and situational (urgency, importance, control) factors did not significantly moderate the relationship between phone use and coping efficacy.

Situation-, Person-, and Device-Specific Factors When Mothers Use Their Smartphones for Coping With Stress

Smartphones are now integrated into most parts of our daily lives (Ling, 2012; Schnauber-Stockmann & Mangold, 2020). They are used at work, on the bus, in bed, and at the dinner table (Moser et al., 2016; Schnauber-Stockmann & Mangold, 2020) and are thus "carried into an unprecedented range of situations" (Humphreys et al., 2018, p. 2795). A large and growing body of research focuses on how this omnipresence influences a user's wellbeing and social relationships (Campbell, 2019; Meier et al., 2020). One of the most frequently assessed associations is the relationship between smartphone use and stress, which is mainly found to be positive (Elhai et al., 2017; Vahedi & Saiphoo, 2018).

Positive correlations between smartphone use and stress are often explained by the fact that smartphones create a growing communication pressure and increase stress (Freytag et al., 2021). There are, however, also reasons to believe that this relationship might be vice versa: stress could also cause smartphone use or, in other words, due to the multitude of resources they offer, smartphones could be tools that individuals use to cope with stress (Carolus et al., 2019; Wolfers, Festl, & Utz, 2020). Previous studies primarily associated stress and smartphone use on a general individual level and did not look into the situational device usage in stressful situations (Wolfers, Festl, & Utz, 2020). Such general assessments of the relationship between stress and smartphone use could mask important dynamics, as memory biases could distort effects (Boase & Ling, 2013). Moreover, a cross-sectional, individual approach does not allow to differentiate between different types of uses and types of situations (Johannes et al., 2020).

All in all, our current knowledge about how individuals use smartphones in stressful situations and which kind of use offers benefits or disadvantages is still limited. In this paper, we will assess how smartphones are used in stressful situations and explore under what circumstances this use is effective. We will examine this in a context where smartphone use is particularly critically discussed: when parents use their smartphones while parenting.

While smartphone use in any social situation is seen critically, this is especially true for parental phone use while being with children (Moser et al., 2016; Wolfers, 2021). Several studies found parental smartphone use to be associated with lower maternal sensitivity, worse quality of parent-child interaction, and problematic child behavior (Elias et al., 2021; Vanden Abeele et al., 2020; Wolfers, Kitzmann, et al., 2020). Despite these adverse effects, multiple studies, however, also found that parents evaluate parenting websites, instant messengers, and social networking sites as valuable resources to find information and social support (Brady & Guerin, 2010; Lupton et al., 2016; Lupton, 2017). Accordingly, first qualitative studies suggested that in the parenting context, the readily available resources offered through a smartphone might be particularly valuable when confronted with stressful situations (Radesky et al., 2016; Wolfers, 2021).

Building on a nexus of the literature on stress management, mobile media use, and well-being in general as well as for the parenting context in particular, the present study will provide an in-depth look into parental smartphone use in stressful situations. Specifically, we will focus on mothers as they are still the primary caregivers in most societies (Craig & Mullan, 2011) and thus should experience more stressful situations while parenting. In our research, we employ an innovative experience sampling approach, which allows us to explore situation-, person-, and device-specific factors affecting both the use of smartphones for coping with stress and the effectiveness of this use.

Smartphones as Tools for Coping With Stress

According to the transactional model of stress and coping, stressful situations arise if the demands placed upon an individual exceed the available resources (Lazarus & Folkman, 1984). Stressful situations, which encompass major stressful events and “daily hassles,” are a common experience for young children’s parents (Crnic & Greenberg, 1990; Deater-Deckard, 2004). The stress parents experience in and beyond their parenting role was shown to be negatively related to parental wellbeing but also associated with adverse outcomes for the child’s

development (Bakoula et al., 2009). Successful coping with the many stressful situations experienced throughout parents' daily lives is therefore of great importance for the parent and the family system as a whole (Crnic & Greenberg, 1990).

Coping behaviors are the "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). According to the transactional model, an individual appraises the stressfulness of a situation in a first appraisal. In a second appraisal, the available options to cope with the stress are evaluated (Lazarus & Folkman, 1984). Traditionally, coping options have been understood as different coping strategies, defined as the "objectives or intents of coping response" (Compas et al., 2001, pp. 88–89). Coping strategies include, for example, planning, social support seeking, or self-distraction. They are broadly differentiated into approach or problem-focused strategies that aim to solve the stress-evoking problem and into avoidance or emotion-focused strategies directed at avoiding the stressor or calming the stress-induced emotions (for a detailed discussion, see Skinner et al., 2003).

In a review of the literature on media use for coping, Wolfers and Schneider (2020) suggested conceptualizing coping tools as an additional dimension of coping options which they define as "instruments through which (a) a coping goal can be achieved and (b) a coping behavior can be performed" (Wolfers & Schneider, 2020, p. 13). According to this conceptualization, individuals *combine* coping strategies and coping tools to cope with stress. Smartphones and the different constituent media (media nested into the phone structure; Humphreys et al., 2018) are among such instruments (Wolfers, 2021).

Studies suggested that parents use the resources offered to them through their smartphones when confronted with stress (Brady & Guerin, 2010; McDaniel & Radesky, 2018; Radesky et al., 2016; Wolfers, 2021). As a result of a qualitative study, Wolfers (2021) reported that parents use their smartphones to find information, seek social support, find resources for

active coping, and distract themselves from the stressful instance. Other studies similarly reported that parents turn to Internet resources to search for information and find social support, suggesting that parents combine smartphones with several coping strategies (Dworkin et al., 2013; Plantin & Daneback, 2009). However, the research on parental smartphone use in stressful situations is still limited, as many studies did not specifically focus on stressful situations or rely on overall phone use ratings and reports (Wolfers, 2021). These overall ratings can result in recall biases, as smartphone use has become highly habitual (Boase & Ling, 2013; Yuan et al., 2019). As a first step, our study, therefore, aims at descriptively assessing how often mothers use smartphones for coping with stress (RQ1) and which coping strategies mothers combine with their smartphones (RQ2).

The Coping Effectiveness of Smartphones

Coping is effective if the feeling of stress is regulated successfully and if, when possible, the stress-evoking problem is dealt with successfully (Tennen & Affleck, 2002). A critical question in times of increasing smartphone use is if individuals in general and parents, in particular, use their smartphones effectively when confronted with stress. Previous research did not provide a clear answer to this question. Researchers working on "smartphone addiction" often treat smartphone use for coping purposes as a negative way of coping, contributing to developing addictive behavior (e.g., Chiu, 2014; Gökçearslan et al., 2018). Other studies, however, reported that smartphones can also be used effectively to cope with negative emotions and stress (e.g., Hoffner & Lee, 2015; Melumad & Pham, 2020). Wolfers (2021) moreover confirmed that parents often describe smartphone use as effective for coping with stress. Looking at these ambivalent research findings, it could also be that an overall relationship between smartphone use for coping and coping effectiveness was not found because the effectiveness of smartphones highly depends on contextual factors (Kushlev & Leitao, 2020). The "fallacy of uniform efficacy" (Bonanno & Burton, 2013) describes the attempt to classify a coping option as more or less

successful across all situational circumstances and contexts. Wolfers and Schneider (2020) argued that this fallacy also applies to much research on media as a form of coping option. Overall, it is still unclear if smartphones help or disturb effective coping on the situational level and it seems questionable if there is a uniform relationship at all. We, therefore, openly ask if smartphone use for coping is associated with coping effectiveness (RQ3).

Rather than assessing only the uniform coping effectiveness of smartphones, we adopted a contextual approach, which emphasizes the need to consider the context in which a stressful situation – and the smartphone use – takes place (Folkman & Moskowitz, 2004; Vanden Abeele, 2020; Wolfers & Schneider, 2020). DeLongis and Holtzman (2005) describe three general contextual domains on which "the likelihood of engaging in certain coping strategies, as well as the effectiveness and outcomes of these coping strategies" depend (DeLongis & Holtzman, 2005, p. 1634). They differentiate between the social context, the situational circumstances of the stressful situation, and individual factors. In her analyses of the construct of digital wellbeing, Vanden Abeele (2020) adds another set of factors when looking at the uses and effects of mobile media. She argues that stable and momentary characteristics of the device itself strongly shape effects on digital media use on (digital) wellbeing.

This paper specifically focuses on the social context of parental phone use while being with children. Within this context, we assess how person-specific, situation-specific, and device-specific factors affect how mothers use their smartphones to cope with stress and whether this device use is effective.

Person-Specific Factors in Using Phones for Coping With Stress

As a result of their literature review on media use for coping purposes, Wolfers and Schneider (2020) suggested that in a situation of overload, an individual will more likely turn to a coping option that is already "top of mind" and therefore salient. In fact, the results of

several studies suggested that problematic forms of digital media use develop because individuals start to always turn to a certain highly salient type of media (e.g., a certain online game) if they are stressed (McNicol & Thorsteinsson, 2017; Plante et al., 2019; Snodgrass et al., 2014).

For many users, mobile media as an access point to the online world are highly salient, which means that users are cognitively engaged with the online world even if they are not using an Internet-enabled device (Freytag et al., 2021; Klimmt et al., 2018; Reinecke et al., 2018). Previous research has shown that the cognitive salience of online content is positively related to stress (Freytag et al., 2021). However, there is no direct evidence associating the salience of online content with coping. Building on the theoretical assumption of Wolfers and Schneider (2020) that the salience of a coping tool impacts their use, we assume that users that are highly cognitively engaged with their phones will use their device to cope with stress more often (H1a).

Besides offering access to content that can be cognitively engaging, a smartphone is also a touchable and viewable device that, unlike many other electronic media such as television, can be placed nearly everywhere in every room (Richardson, 2007). Many people have their phones very close to them most of the time to easily access them (Dey et al., 2011). This closeness means that many people see or feel their smartphone constantly, and thus, a smartphone is not only cognitively but also *physically* salient. Although physical and cognitive salience should vary across different situational contexts, we argue that both constructs also differ between persons and thus can be measured on the individual level (Freytag et al., 2020; Reinecke et al., 2018; Vanden Abeele, 2020). We argue that in a stressful situation, which is – by definition – a situation of overload, a coping tool that is in sight or touch will be used more often. Thus, we assume that individuals for whom their smartphone has a higher physical salience use it more often for coping with stress (H1b).

A second individual factor, which recent research on phone use and wellbeing has discussed, is phone use self-regulation (Halfmann & Rieger, 2019; Reinecke & Hofmann, 2016).

Due to the easy and constant access to mobile devices, there is "little to no environmental control" on smartphone use, leaving most of its necessary regulation to the individuals themselves (Bayer et al., 2016, p. 76). Thus, individuals have to control desires to check their phones or have to end phone use when this use interferes with current goals, such as coping with a stressful situation (Hofmann et al., 2017). Indeed, in a qualitative interview study, the ability to regulate phone use emerged as an important prerequisite for successful use of phones for coping with stress in a parenting context (Wolfers, 2021). Parents described that they only used their phone successfully for coping when they managed to end their phone use after achieving their coping goal. We, therefore, expect a moderation effect between coping effectiveness and the ability to regulate phone use such that phone use for coping is more positively/ less negatively[3] related to coping effectiveness for those with higher phone use self-regulation skills (H2).

Situation-Specific Factors in Using Phones for Coping With Stress

In their literature review, Wolfers and Schneider (2020) argue that situational factors of coping with media must receive more attention to avoid judging phone use as uniformly effective or ineffective. In the present study, we will focus on three situational factors: importance, urgency, and control.

We derived the situational factors of importance and urgency from the qualitative study of Wolfers (2021). Situational urgency describes the sense that somebody has to respond to situational circumstances quickly (Stephens et al., 2013). In Wolfers' (2021) study, mothers reported using their phones more for coping if they felt high pressure to do something about the stressful situation. In other studies assessing parental Internet use, parents similarly emphasized the advantages of providing quick and easy access to information and social support if these resources are urgently needed (Lupton, 2017; Strange et al., 2018). Therefore, we assume that mothers use their phones more (H3a) and more effectively (H3b) in urgent situations.

[3] Note that we use this wording because the direction of the overall relationship between phone use and coping effectiveness is not clear (RQ3).

The second situational characteristic Wolfers (2021) describes is the importance of a stressful situation, determined by the importance of the stress-evoking problem. In Wolfers' study, mothers reported that in important situations, they do not quickly assess non-expert resources via their smartphones but rather look for personal contact to experts such as doctors or teachers. Similarly, in the study by Strange et al. (2018), parents described Internet resources as unhelpful for important topics such as breastfeeding and sleeping behavior due to the conflicting information available. We, therefore, assume that smartphones are used less in important situations (H4a) and that in more important situations, phone use relates to decreased coping effectiveness (H4b).

As a third factor, we assess situational control, defined as an individual's ability to influence the stress-evoking circumstances. Control is the most prominent factor studied in the context of stress and coping (Folkman & Moskowitz, 2004). According to the coping fit hypothesis, situational control determines if approach or avoidance coping is the more effective strategy: In situations with low control, approach strategies should be less effective because the individual *cannot* solve the stressful problem (Park et al., 2004). Rieger et al. (2017) argued that phone use increases situational autonomy and control by offering access to options that can be chosen autonomously. While this might influence an individual's perception of situational control, it is not clear how coping effectiveness of phone use for coping differs according to different levels of situational control. We, therefore, openly ask if the association of phone use for coping and coping effectiveness depends on the perceived situational control (RQ4).

Device-Specific Factors in Using Phones for Coping

Smartphones are metamedia that incorporate different constituent media (i.e., applications; Humphreys, von Pape & Karnowski, 2018). Metamedia offer individuals the opportunity to do a wide range of things; however, these usage possibilities are different for each person and depend on how an individual uses a device: Each individual has downloaded different ap-

plications onto their smartphones and uses different functions (Humphreys et al., 2018). Referring to Vanden Abeele (2020), we will differentiate between more stable features of an individual's smartphone, namely the overall phone personalization, and momentary features of smartphone content, namely positive valence and semantic affinity.

Smartphones can be easily personalized (Böhmer & Krüger, 2013; Melumad & Pham, 2020). Choices for or against specific apps determine which options are easily accessible when stressful situations need to be managed (Melumad & Pham, 2020; Vanden Abeele, 2020). Indeed, in an experimental study, Melumad and Pham (2020) showed that participants who could use their own smartphones recovered more quickly after a stress-inducing task compared to participants who only could use the smartphone of somebody else. This finding implies that the personalization of devices should help when individuals are confronted with stressful situations. The degree of personalization of smartphones strongly differs between individuals (Falaki et al., 2010). We assume that participants who have more strongly personalized their phone use it more often for coping with stress (H5) and that phone personalization moderates the relationship between phone use for coping and coping effectiveness such that phone use for coping is more positively/less negatively related to coping effectiveness for those who have more strongly personalized their phones (H6).

Interactions Between Situation-Specific and Momentary Device-Specific Factors

While differentiating person-specific, situation-specific, and device-specific factors is helpful in terms of classification, those factors might also influence each other (Vanden Abeele, 2020). In particular, it is likely that the characteristics of a situation influence which smartphone content is used. We will therefore examine the momentary device-specific factors also in relation to the situation-specific factors. Based on Wolfers and Schneider (2020), we build on the media characteristics discussed in Zillmann's (1988) mood management theory to investigate momentary device-specific factors. Specifically, we focus on the characteristics valence

and semantic affinity, as these can be assessed by users similarly well for the wide range of different smartphone content.

Mood management theory predicts that in stressful situations, individuals will choose media content that is more positive and semantically different from the current stressors (Zillmann, 1988a). Positive media content (e.g., a comedy) is thus assumed to be more effective in improving the bad mood state of stressed individuals compared to negative content (e.g., a negative news article) by "supersed[ing] earlier affective experiences" (Zillmann, 1988b, p. 152). Additionally, content that does not connect to current stressors can disrupt stressful mood states and thereby effectively reduce stress (Zillmann, 1988b). In mood management theory, media use for the regulation of states focuses on changing emotions or moods and not on changing problems. Stevens and Dillman Carpentier (2017) therefore argue that avoidance or emotion-focused coping is related to coping behavior in line with Zillmann's (1997) mood management theory, while approach or problem-focused coping is not. According to the coping-fit hypothesis, avoidance or emotion-focused coping should occur in less controllable situations because, in these situations, the stress-evoking problem cannot be solved (Park et al., 2004).

Connecting the reasoning by Stevens and Dillman Carpentier (2017) and the coping-fit hypothesis, we argue that in less controllable situations, media choices according to mood management theory are more likely. We thus assume that in less controllable situations, individuals choose more positive (H7.1a) content that is semantically different from the stress-evoking problem (H7.2a). Building on mood management theory, which posits that in more stressful situations, positive and semantically different media content leads to stress decrease (Zillmann, 1988b), we additionally assume that in less controllable situations choosing positive content (H7.1b) that is semantically different from the stress-evoking problem (H7.2b) is also related to increased coping effectiveness. We assume that the same applies to less important situations, as addressing the stress-triggering problem should be less central in less important situations

making media selection for mood management more likely. Thus, following the same reasoning, we also assume that individuals choose positive content (H8.1a) and semantically different (H8.2a) content and that using positive (H8.1b) and semantically different (H8.2b) is also more effective in less important situations.

Within stress research, research on urgent situations is still scarce. It seems reasonable to assume that urgent situations inherently require direct confrontation of the stressor. However, urgency could also be associated with a high stress intensity. Such higher stress levels may first have to be regulated on the emotional level requiring positive and not stressor-related content (Hastall, 2017). We, therefore, openly explore the relationship between content features and situational urgency (RQ5).

All hypothesis and research questions, the study design, and analyses models were pre-registered (https://osf.io/v8y9f/?view_only=44b7d4e46c724dac8b31afb00eb2abdc). Deviations from the pre-registrations are outlined in detail in a list on OSF under https://osf.io/aw2kd/?view_only=40dbda9996e7480eb123ae23e0a8dffb.

Methods

Procedure

To test our hypotheses, we conducted an experience sampling study with mothers in Germany using the application movisensXS version 1.5.8 (movisens GmbH, 2020). The application can only be installed on smartphones based on Google's operating system Android, which in 2020 had a market share in Germany of about 81% (Kantar Worldpanel, 2021). Interested participants were informed about the study design, participation criteria, and the movisensXS app. After participants gave their consent, we provided a step-by-step guide about how to install the app on their smartphones and how to adapt their phones' settings. Respondents were able to start the study between November 4, 2020, and November 23, 2020. After filling in a presurvey, participants were asked to fill in four questionnaires a day for one week resulting in a maximum of 28 questionnaires per participant. In the end, participants answered

a postsurvey. As compensation, participants received a fixed amount for installing the app and completing the presurvey (€10), for each completed daily questionnaire (€0.85), and for completing the postsurvey (€5). If participants completed at least 20 daily questionnaires, they received a bonus of €10, resulting in a maximum remuneration of 48.80 € per participant.

We aimed to sample stressful situations. Stressful situations should be common, concrete events in the daily life of parents. However, they should not happen constantly and might, thus, be infrequent when randomly sampling time-points (Wheeler & Reis, 1991). Stressful events should be remembered more easily than other less intense states as, for example, mood (Wheeler & Reis, 1991). However, Wolfers (2021) showed that participants had difficulties recalling whether they used their phone for coping. We used a quasi-experience sampling design (Schnauber-Stockmann & Karnowski, 2020) with surveys at fixed time points. Such a procedure is recommended for concrete, infrequent events (Conner & Lehman, 2012; Scollon et al., 2003). To minimize recall error, we asked participants to only report about the last two hours before filling in the questionnaire. Reminders for the daily questionnaires were sent at predefined time points every day at 9 am, 12.30 noon, 4 pm, and 7.30 pm. Participants could delay the start of the survey by up to 35 minutes. The study was approved by the ethics committee of *blinded for review*.

Participants and Situations

Mothers with at least one child born on or after January 1, 2014, were recruited over personal contacts, notices at different locations, and mailing lists of childcare or family centers all over Germany. We also recruited on social media (Twitter, Facebook, Reddit) by posting in relevant parent groups, asking accounts with many followers to post, and using a Facebook advertisement. In total, 234 participants installed the app and filled in the presurvey, of which 209 also completed the postsurvey.

The 234 participants completed 4,948 daily questionnaires resulting in an overall compliance rate of 76% (range: 0-100%). Participants reported having experienced a stressful situation in 2,038 instances (41%), of which 1659 (81%, 33% of the whole sample) were experienced while being with their children. As we focus on the parental context, we excluded stressful situations in which children were not present. Four situational questionnaires including stressful situations and children were not filled in completely, resulting in a final Level-1 sample of 1,655 situations. In total, 16 participants did not report on any stressful situation while being with their children and were excluded from the analyses. Thus, the final sample included 218 mothers.

Mothers were on average 33.10 years old (*SD* = 4.22) and had between one and five children (*M* = 1.72, *SD* = 0.89). The youngest child was on average 1.78 years old (*SD* = 1.52). About 61% of our sample reported having completed a university degree which is higher than the figure of 31% for women in Germany between 30 and 35 (Autorengruppe Bildungsberichterstattung, 2020). Of the 218 participants, 196 lived with another parent of one of their children, 17 were single mothers, six lived with a partner who was not a parent of one of their children, and two with other family members (multiple choices possible). Most of our sample was on parental leave or stayed at home full-time (45%) or worked part-time (34%). About 8% were in an educational program and 9% were working full time, which is slightly lower than the percentage for mothers working full-time with a child under 6 in Germany in a representative sample (13%, Keller & Kahle, 2018).

Measures

This paper contains not all constructs which we asked for in the questionnaires. An overview of all constructs measured in this study can be found on OSF.

Situational Level Variables (Experience Sampling Questionnaires)

Phone use in stressful situations. Participants answered whether they had used their smartphone during the stressful situation, using a dichotomous item (484 yes/ 1,172 no).

Phone use features. If participants indicated to have used their smartphone in the stressful situation, they indicated how they would describe the content they used on a scale from 1 (*negative*) to 5 (*positive*), measuring the concept of valence (M = 3.75, SD = 0.96). To measure semantic affinity, they indicated if the content was related to the stressful situation on a scale from 1 (*not at all*) to 7 (*very strongly; M* = 2.91, *SD* = 2.26).

Coping effectiveness. Coping effectiveness was measured using two different indicators: The change in stress intensity before and after the situation and perceived coping efficacy. To assess stress intensity and stress change, participants were asked how stressed they felt during the experienced stressful situation on a scale from 1 (*not at all)* to 5 (*very much*) and how stressed they felt after the situation had ended on the same 5-point scale. To calculate stress change, we subtracted the initial stress level from the stress level at the end (M = -1.05, SD = 1.12, range -4 to +3). Negative values indicate a stress decrease. To assess perceived coping efficacy, participants indicated if what they did or thought in the situation helped them cope with the stress on a scale from 1 (*did not help*) to 5 *(helped well; M* = 3.05, *SD* = 1.16*)*.

Coping strategies. Coping strategies were measured using a shortened version of the Brief COPE (Carver, 1997; translated by Knoll et al., 2005), adapted to the parental situation based on the findings of Wolfers (2021). The questionnaire included one item of each of the strategies self-distraction, active coping, emotional social support, giving up, instrumental social support, venting, positive reappraisal, planning, humor, information seeking, taking a break, and information avoidance, respectively. The respondents indicated first for each strategy whether they used it (*yes*/*no*). Participants who used their phone were additionally asked for each strategy whether they followed it by using their phone (*yes*/*no*).

Characteristics of the situation. Situational control was measured asking participants if they felt they could influence the situation on a scale from 1 (*not at all*) to 5 (*very much*; based on Perrez & Reicherts, 1992; M = 2.76, SD = 1.13). Importance was measured by asking about the importance of the stress-inducing problem on a scale from 1 (*not important*) to 5 *(very*

important; Thies & Kordts-Freudinger, 2019; *M* = 3.00, *SD* = 1.21). Urgency was measured by asking participants how urgent they needed to take action in the situation on a scale from 1 (*not at all*) to 5 (*very much, M* = 3.59, *SD* = 1.05).

Individual Level Variables (Presurvey)

Cognitive and physical salience. We measured cognitive salience with the salience subscale of the online vigilance scale (Reinecke et al., 2018) adapted to smartphones (*M* = 2.22, *SD* = 0.87, α = .87, example item: "My thoughts often drift to smartphone content"). Physical salience was measured by asking participants five self-developed items on a scale from 1 (*does not apply*) to 5 (*does apply*, *M* = 3.06, *SD* = 0.95, α = .82). Example items include: "My smartphone usually is placed in such a way that I can see it" and "When I'm away from home, I always have my smartphone readily available, for example, in my pants pocket."

Phone personalization. Personalization of the smartphone was measured using the scale of Böhmer and Krüger (2013). Participants indicated how often they, for example, "had installed apps in the last month." We added the item "changed the settings of apps." Categories were recoded to reflect the mean of the choice text: 0 (*0 times*), 1.5 (*1-2 times*), 4 *(3-5 times*), 8 (*6-10 times*), and 11 (*more than 10 times*; *M* = 1.22, *SD* = 1.03, α = .64). While Cronbach's alpha was low, a confirmatory factor analysis showed a good fit (see OSF). Thus, we decided not to drop any items.

Phone use self-regulation skills. Participants reported on their phone use self-regulation skills by answering five statements on a frequency scale ranging from 1 (*never*) to 5 (*very often*). We adapted four items from the Compulsive Internet Use Scale (Meerkerk et al., 2009; German version: Peukert et al., 2012), measuring unsuccessful attempts to regulate smartphone use (e.g., "I find it difficult to stop using my smartphone"). We added one item describing successful regulation ("I put my smartphone away when I have achieved my goal"). All items were included into a mean index (*M* = 3.40, *SD* = 0.89, α = .86).

Data Analyses

To test our hypothesis, we ran multilevel regression models for each dependent variable using the lme4 package (version 1.1.26; Bates et al., 2015) in R (version 4.0.3, R Core Team, 2020). In a first step, we calculated null models only including the random intercepts to assess the Intraclass Correlations Coefficients (ICC). In a second step, the control variables were entered. Next, we added the independent variables of interest in a hierarchical procedure. We evaluated hypotheses based on model comparisons with and without the respective predictor variable in the respective step using a likelihood ratio test with a $p < .05$ as significance level (using Full-Maximum-Likelihood estimation, ML). For the linear models, the final model was estimated based on the more robust restricted maximum likelihood estimation (REML, see Zuur et al., 2009). We considered a value of $|t| > 2$ for the respective predictor in the final linear models and odds ratio confidence intervals which do not include 1 for the logistic regression as an additional criterium for hypothesis support (Gelman & Hill, 2007). Following the recommendations of Enders and Tofighi (2007), variables on the situational level were group mean centered and variables on the individual level were grand mean centered. We report marginal and conditional r^2 based on Nakagawa and Schielzeth (2013). We assessed model assumptions by looking at the distributions of residuals and variance inflation factors (see OSF).

Results

Descriptive Findings

In our first and second research questions, we asked how mothers use smartphones to cope with stress. Of all 2,030 stressful situations (8 incomplete questionnaires excluded), smartphones were used in 630, representing a 31% share. Focusing on the 1,655 stressful situations in which child(ren) were present, this share was slightly higher (38%; 483 situations), which answers RQ1. In general, mothers reported applying active coping in about half of the situations while being with their children (53%). The second and third most applied strategies

were planning (38%) and venting (19%). Self-distraction, emotional support seeking, instrumental support seeking, giving up, positive reappraisal, and taking a break were each employed in about one out of 10 situations (9-12%). Participants applied information avoidance (2%), information seeking (3%), and humor (3%) less frequently.

When looking at the strategies which participants applied by using a phone, these proportions differ greatly. Here, self-distraction was the most applied coping strategy (49%), followed by taking a break (27%). Active coping and emotional support were the third most prominent strategies (16%), followed by giving up (13%), information seeking (13%), planning (12%), and instrumental support (12%, see also Table A2). Thus, answering RQ2, phone use was mainly combined with the strategy of self-distraction and taking a break. While problem-focused coping strategies, such as active coping and planning, were also important, participants combined them less frequently with smartphones.

Multilevel Analyses

To answer our remaining research questions and hypotheses, we ran multilevel regression models. We report the results of the models for each dependent variable in the following.

Phone Use in Stressful Situations

We measured phone use in stressful situations with a dichotomous variable. We, thus, calculated a logistic multilevel regression model. The ICC for situational phone use was 0.19. Thus, about one-fifth of the variance in using phones for coping with stress was explained by the individual level. Confirming H1a, the cognitive salience of phones positively predicted phone use in stressful situations (χ^2 (1) = 13.48, $p < .001$). Contrary to H1b, physical salience was not related to phone use in stressful situations (χ^2 (1) = 0.01, $p = .927$). Similarly, H5 was rejected, as phone personalization was not related to situational phone use for coping (χ^2 (1) = 0.90, $p = .343$). Turning to situational predictors of phone use in stressful situations, neither urgency (χ^2 (1) = 0.12, $p = .730$), nor importance (χ^2 (1) = 3.03, $p = .082$), or control (χ^2 (1) =

1.91, p = .167) significantly predicted if mothers used their phones in stressful situations (rejecting H3a, H4a, and answering RQ4). For the final model coefficients, see Table 1.

Table 1

Multilevel logistic regression analysis on phone use in stressful situations (final model)

	Fixed effects				
Parameters	Estimate	*SE*	*z*	OR	95%CI
Individual level					
Intercept	-1.07	0.08	-12.60	0.34	[0.29 / 0.40]
Age	-0.01	0.02	-0.67	0.99	[0.95 / 1.02]
Youngest child age	0.06	0.06	1.10	1.06	[0.95 / 1.19]
Education	-0.08	0.17	-0.48	0.92	[0.66 / 1.29]
Phone use frequency	0.21	0.12	1.79	1.23	[0.98 / 1.55]
Cognitive Salience	0.36	0.10	3.47	1.44	[1.17 / 1.76]
Physical Salience	-0.02	0.10	-0.20	0.98	[0.81 / 1.19]
Personalization	0.08	0.08	0.95	1.08	[0.92 / 1.26]
Situational level					
Urgency	-0.06	0.07	-0.83	0.94	[0.82 / 1.08]
Importance	0.09	0.06	1.44	1.10	[0.97 / 1.25]
Control	-0.09	0.06	-1.39	0.92	[0.8 / 1.05]
R^2 (marginal/conditional)	.06/.19				
Random Intercept	*SD* = 0.72				

Note. 1,655 observations of 218 individuals. OR = Odds ratio, CI = confidence interval. Individual-level predictors are grand mean centered, situation-level predictors are group mean centered. Model formula: phoneuse ~ 1 + (1|participant) + age.mother + age.youngest.child + spu.general + educ.mother + physical.salience + cognitive.salience + coping.expectations + personalization + urgency + importance + control [family = binomial].

Coping Efficacy

We calculated two multilevel regression models for coping efficacy, one for perceived coping efficacy (PCE) and one for stress change. The ICC for PCE indicated that the individual level explained 22% of the variance, while for stress change, this share was smaller with an ICC of .16.

In RQ3, we asked if coping efficacy differed between situations, in which the phone was used and situations without smartphone use. Answering this question, phone use was not a

significant predictor of perceived coping efficacy (χ^2 (1) = 0.44, p = .509). However, phone use did predict stress change such that phone use was associated to less stress decrease compared to coping without phones (χ^2 (1) = 7.52, p = .006). The interaction between phone use and personalization did not influence any of the indicators for coping efficacy (PCE: χ^2 (1) = 1.15, p = .283, stress change: χ^2 (1) = 0.07, p = .797), rejecting H6. Similarly, the interaction between self-regulation skills and phone use did also not influence coping efficacy (PCE: χ^2 (1) = 0.34, p = .558, stress change: χ^2 (1) = 1.73, p = .189) rejecting H2. In H3b and H4b, we expected significant interaction effects between phone use and the situational factors of urgency and importance, respectively. Both hypotheses were not supported (urgency & PCE: χ^2 (1) = 0.17, p = .677; urgency & stress change: χ^2 (1) = 1.61, p = .205; importance & PCE: χ^2 (1) = 0.80, p = .371, importance & stress change: χ^2 (1) = 0.14, p = .707). Referring to RQ4, we also did not find significant interaction effects with situational control (PCE: χ^2 (1) = 0.76, p = .384, stress change: χ^2 (1) = 0.44, p = .506). Table 2 shows the coefficients of the final models.

We additionally assessed the characteristics of the phone content that was used during stressful situations. For these analyses, we again ran the multilevel regressions without the interaction effects, with the smaller sample including only situations in which the phone was used and including the content features of valence and semantic affinity. Valence of the used content was a positive predictor of perceived coping efficacy (χ^2 (1) = 9.37, p = .002), but semantic affinity was not (χ^2 (1) = 3.33, p = .068). Neither of these factors significantly predicted stress change (valence: χ^2 (1) = 0.59, p = .441; semantic affinity χ^2 (1) = 0.18, p = .673). There were no significant interactions between the content used and the situational characteristics (see Table A3). Thus, H7b and H8b were not supported.

Table 2

Multilevel linear regression analysis on coping efficacy (final models)

Dependent variable	**Perceived coping efficacy**			**Stress change**		
	Fixed effects			*Fixed effects*		
Parameters	Estimate	*SE*	*t*	Estimate	*SE*	*t*
Individual level						
Intercept	3.05	0.05	65.34	-1.07	0.04	-24.84
Age	0.01	0.01	0.63	-0.01	0.01	-0.81
Youngest child age	-0.01	0.03	-0.37	0.00	0.03	0.05
Education	0.19	0.10	1.94	-0.07	0.09	-0.81
Phone use frequency	-0.06	0.07	-0.88	0.02	0.06	0.30
Personalization	0.04	0.05	0.91	-0.05	0.04	-1.16
Phone self-regulation	0.00	0.06	0.00	-0.05	0.06	-0.83
Situational level						
Stress intensity T1				-0.67	0.03	-20.16
Phone use	-0.02	0.06	-0.32	0.16	0.06	2.87
Effort	-0.01	0.03	-0.43	0.12	0.03	3.99
Urgency	0.04	0.03	1.44	0.04	0.03	1.37
Importance	0.00	0.03	0.07	0.09	0.03	3.51
Control	0.27	0.03	10.07*	-0.14	0.03	-5.39
Interactions						
Perso*Phone use	0.05	0.06	0.92	-0.00	0.05	-0.07
Self-reg*Phone use	-0.04	0.07	-0.58	0.09	0.07	1.29
Urgency*Phone use	0.00	0.08	0.03	0.08	0.07	1.05
Importance*Phone use	-0.08	0.07	-1.04	0.03	0.07	0.26
Control*Phone use	-0.06	0.07	-0.86	-0.04	0.06	-0.67
R^2 (marginal/conditional)	.06/.28			.17/.37		
Random Intercept	*SD* = 0.55			*SD* = 0.51		

Note. 1,655 observations of 218 individuals. Individual-level predictors are grand mean centered, situation-level predictors are group mean centered. Model formula: cop.eff ~ 1 + (1|participant) + age.mother + age.youngest.child + spu.general + educ.mother [+ Stress.T1] + personalization + self-reg.config + self-reg.skill + phone.use + urgency + importance + control + effort + phone.use*personalization + phone.use * self-reg.config + phone.use*self-reg.skill + phone.use*urgency + phone.use*importance + phone.use*control. * |t| > 2.0, indicates a significant effect (Gelman & Hill, 2007).

Perceived Phone Use Features

Overall, mothers used rather positive (*M* = 3.75, *SD* = 0.96) and not stressor-related (*M* = 2.91, *SD* = 2.26) content on their phones, when they were confronted with a stressful situation. For valence, ICCs showed that 26% of the variance was explained by the individual level. This amount was smaller for semantic affinity with 16%. In H7.1a and H8.1a, we proposed that positive content will be used more in stressful situations, which are less controllable and more important. Contrary to H7.1a and H8.1a, use of positive content did not depend on the level of situational control (χ^2 (1) = 2.12, *p* = .145) or on situational importance (χ^2 (1) = 0.00, *p* = .969, see Table 3).

Table 3

Multilevel linear regression analysis on perceived content features (final models)

Dependent variable	**Positive valence**			**Semantic affinity**		
	Fixed effects			*Fixed effects*		
Parameters	Estimate	*SE*	*t*	Estimate	*SE*	*t*
Individual level						
Intercept	3.73	0.06	66.65	2.91	0.13	23.03
Age	-0.02	0.01	-1.32	0.05	0.03	1.60
Youngest child age	-0.00	0.04	-0.01	0.03	0.09	0.38
Education	0.29	0.12	2.45*	-0.17	0.27	-0.65
Phone use frequency	-0.15	0.07	-2.10*	-0.05	0.16	-0.28
Situational level						
Urgency	0.04	0.05	0.80	0.23	0.12	1.89
Importance	-0.01	0.05	-0.29	0.42	0.12	3.63*
Control	0.06	0.05	1.22	-0.06	0.11	-0.56
R^2(marginal/conditional)	.04/.26			.06/.23		
Random intercept	*SD* = 0.45			*SD* = 0.95		

Note. 483 observations of 153 individuals. Individual-level predictors are grand mean centered, situation-level predictors are group mean centered. Model formula: phone.content ~ 1 + (1|participant) + age.mother + age.youngest.child + spu.general + educ.mother + urgency + importance + control. Table format: Linck & Cunnings (2015). * |t > 2.0, indicates a significant effect (Gelman & Hill, 2007).

Answering RQ5, use of positive content did also not depend on the level of situational urgency (χ^2 (1) = 0.64, p = .424). In H7.2a and H8.2a, we proposed that content related to the stressor will be used less in less controllable situations and less important situations. H7.2a was not confirmed, as situational control did not significantly predict semantic affinity of the used content (χ^2 (1) = 1.80, p = .179). Finally, we could confirm H8.2a: In stressful situations, which were rated as more important, mothers reported using their smartphones more for stressor-related content (χ^2 (1) = 22.38, p < .001). Content related to the stressor was also used more in more urgent situations, but this effect was not significant (χ^2 (1) = 3.57, p = .059). For an overview of the decision regarding each hypothesis, see Table A4.

Discussion

Building on a contextual approach and an experience sampling design, this study aimed to test which person-specific, device-specific, and situation-specific factors predict whether smartphones are used for coping and whether smartphone use for coping is successful. We focused on the parenting context in which smartphone use is particularly critically discussed. All in all, our findings revealed three interesting points, which we discuss in more detail below: (1) the correspondence of several findings with assumptions of mood management theory, (2) the relationship between phone use and less stress decrease indicating that phone use for coping might be not effective, and (3) the relative importance of the situation-specific, person-specific, and device-specific factors implying which factors in the relationship between phone use and coping effectiveness might be particularly interesting for future research.

In the present study, mothers used their smartphones in stressful situations mostly to distract themselves and take a break and, to a lesser extent, find support and information. Reported characteristics of smartphone use content revealed that mothers mostly used positive and stressor-unrelated content. These descriptive results indicate that mothers use their phones in a way that fits the predictions of mood management theory (Zillmann, 1988b). Moreover, using positive content led to a higher perceived coping effectiveness, which also is in accordance with

mood management theory. Thus, our results suggest that the assumptions of mood management theory – although this theory was developed before the rise of digital media – might be well suited to the context of smartphone use in stressful situations. Moreover, our study suggests that in addition to experiments, which were mostly used to test mood management theory (Reinecke, 2017), experience sampling can be a useful design to test mood management using digital media in everyday life.

When confronted with important problems, mothers, however, preferred content related to the stress-evoking problem. This finding and the result that mothers used their smartphones for information seeking and active coping show that – although less prevalent – smartphones can also be used as a tool for problem-focused coping aims. All in all, combining mood management theory for predictions for media use for emotion-focused coping with additional theoretical models for media use for problem-focused coping seems promising for future studies (see also Stevens & Dillman Carpentier, 2017). Theoretical extensions to mood management, which also capture problem-focused coping aims (e.g., informational utility Reinecke, 2017), have not achieved the clarity in which mood management theory makes predictions for emotion-focused coping. For example, it is still unclear whether or when stressed individuals seek positive or negative information or which other media characteristics play a role in problem-focused coping. Thus, further work is needed to theorize on media characteristics when (digital) media are used for problem-focused coping.

Phone use for coping was related to less stress decrease, suggesting that for mothers of young children, on an overall level, coping including phone use seems to be less effective than coping involving no phone use. In conjunction with the adverse effects of phones on parent-child interactions found by other studies (e.g., Vanden Abeele et al., 2020), this finding suggests that mothers should not use their smartphones while parenting, including no use in stressful situations. However, this result also contradicts research findings, according to which parents themselves reported positive effects of using Internet resources for coping (e.g., Wolfers, 2021).

It is, therefore, probably too early to completely discourage parental smartphone use. Rather, this contradiction may be because other conditions not measured here determine whether smartphone use can reduce stress or not. One of these conditions, which we did not examine, is the timing of phone use. In the present study, we focused on phone use directly in stressful situations. Most other studies have not differentiated between different times of use (e.g., in or after stressful situations). Accordingly, it is possible that smartphones, for example, are more likely to be used successfully for stress reduction when revisiting a problem sometime after the stressful situation or that smartphones are more successfully used for recovery in the evening, and not for stress management directly in a situation (see the distinction between coping and recovery made by Reinecke, 2009). The timing of smartphone use, thus, remains a factor that can be of particular interest for future studies.

Building on a contextual approach (Vanden Abeele, 2020; Wolfers & Schneider, 2020), we investigated a complex set of factors that we assumed to influence phone use for coping and the relationship between phone use and coping effectiveness. Of the different person-specific, device-specific, and situation-specific predictors measured, only cognitive salience emerged as a significant predictor for the probability of using a phone for coping. This finding suggests that the previously found relationship between stress and cognitive salience of online content (Freytag et al., 2021) may have been found at least partly because individuals with a higher cognitive salience of online content use their phones more for coping with stress. Physical salience did not significantly relate to using phones. It is, however, possible that physical salience is highly variable between situations and situationally high physical salience might still be related to using it more for coping. Looking at situational variations in both cognitive and physical salience remains an important aim for future research. The sample, which included only frequent phone users, might have determined the null effect of phone personalization. Such users

probably show highly habituated phone use patterns, which are not determined by phone personalization. Differences in personalizations might, therefore, only occur when including less frequent or less knowledgeable users.

Interestingly, the situational factors of urgency, control, and importance did not predict phone use, which somewhat contradicts the phone use practices reported by parents in the qualitative study of Wolfers (2021). A possible explanation might be that urgency, control, and importance only impact phone use in particular circumstances (e.g., when at home, when confronted with a specific stressor). Experience sampling studies entail the advantage that a detailed look into participants' everyday lives can be obtained, producing insights about behavior and feelings and the circumstances under which these behaviors and feelings occur in their real-life setting (Conner & Lehman, 2012). However, as situational circumstances cannot be held constant, the role of single situational factors that might, in reality, depend on other situational circumstances is complex to investigate (Duvenage et al., 2019). Thus, looking at other situational factors and combinations between the situational factors investigated here and other situational factors in controlled experimental settings remains important for future research.

All moderating factors on the different levels we investigated did not significantly influence the relationship between phone use and coping effectiveness. In our view, this does not mean that we should discard contextual approaches for investigating the relationship between coping and smartphone use. Our results could suggest that the factors we measured are not the most important ones and that future research should focus on other aspects, such as differentiating between stressors (Duvenage et al., 2019). Another possibility is that the way we modeled the relationships – linear two-way interactions – did not represent how these factors impact the effectiveness of phones. For many factors, also non-linear associations or three-way interactions are conceivable. Modeling more complex structures affords a larger sample size and additional measures. Connecting phone use tracking data and experience sampling data in future

studies could be a way of integrating more factors and more measurement points without overburdening participants. In addition, qualitative experience sampling approaches might be a way to identify processes and factors that are identified as influential by smartphone users themselves.

Our results suggest that the level that might deserve the most attention in future research are momentary device-specific factors: Valence turned out to be significantly related to coping effectiveness. Other important momentary device-specific factors might be which constituent media are used in what way (e.g., the messaging or posting function of social media sites, different conversation partners, Vanden Abeele, 2020) and which content participants see (e.g., which news or posts). However, also overall characteristics of phone use content similar to valence or semantic affinity (for example, self-assurance, Wolfers, 2021) might be interesting factors to consider in more detail. While previous studies on digital media use and wellbeing often looked at the use of specific media types (e.g., social media), how certain media content is perceived (e.g., positive) has only received limited attention. Our study suggests that assessing the overall perception of used content might be a fruitful way to study smartphone content effects in everyday life also in contexts going beyond stressful situations and parenting. It was recently proposed that perceptions of media use and not the objective features of media use might influence media effects (Wolfers et al., 2021). Measuring such overall perceptions in experience sampling designs might be a fruitful way of assessing these effects in a way that does not overburden participants.

While the selected experience sampling approach allowed us to study stressful situations shortly after they happened, our approach also had limitations. Experience sampling designs are very effortful for participants, making recruiting samples representing the population more challenging. Accordingly, one limitation of the present study is the convenience sample in which mothers with less education were underrepresented. For the cross-level interactions, we should also note that these interactions usually require a large sample size on both levels to find

small effects with sufficient power (Arend & Schäfer, 2019). Thus, replication studies employing a higher sample size and a more diverse sample are warranted to draw more valid conclusions, especially about small effect sizes of cross-level interactions. Moreover, we did not randomly select situations but asked about the last two hours at predefined time points, limiting the transferability of the results to the population of stressful situations.

Our design, moreover, does not allow for causal claims as we cannot control other situational factors and cannot ensure the temporal sequence of causes and effects. In our questionnaire, we tried to follow the temporal logic of a stressful situation. However, it might have been hard for our participants to remember the exact time sequence of a situation. To test causal relations, experimental research is necessary (see, e.g., Raudenbush, 2001).

Our study was conducted among mothers of young children. We chose this context because discussions around maternal or parental phone use were especially controversial. It remains an open question if our results can be applied to different contexts such as situations without the presence of children, or with fathers, or non-caregivers as respondents. Also, for non-caregiving contexts, using phones to cope with stress might be a frequent and potentially helpful coping behavior (Carolus et al., 2019; Wolfers, Festl, & Utz, 2020). However, the applicability of our findings to such other contexts needs to be assessed by future studies.

Finally, our study included a high number of factors. Including many factors can reduce the power of analyses. However, as many recent papers reviewing the field of smartphone use and wellbeing note, the relationship between smartphone use and wellbeing is complex (Kushlev & Leitao, 2020; Vanden Abeele, 2020). Untangling these complex effects will likely require a mixture of approaches consisting of larger studies that include a larger number of factors and smaller studies that aim to test the specific impact of a small set of factors. Thus, our approach represents a critical part of this combination.

Conclusion

Smartphones are now omnipresent in everyday life and are used under many different circumstances. Research must, therefore, choose methodological approaches that can map this complexity in order to answer under which circumstances digital media influence people's well-being in what way. Our experience sampling study contributed to this aim by studying how person-specific, device-specific, and situation-specific factors determine if mothers of young children use smartphones to cope with stress and whether their smartphone use is effective. Our results show that mothers for whom their smartphone is highly cognitively salient used it more for coping. Results, moreover, show that maternal smartphone use patterns in stressful situations fit the predictions of mood management theory. Mothers used their smartphones mainly for emotion-focused coping aims, and they primarily used positive content. Smartphone use was related to less stress decrease during a stressful situation. Using positive content, however, contributed to effective coping. Thus, our results suggest that future studies should focus on what kind of content is used when smartphones are used to cope with stress.

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APPENDIX PAPER 3

Table A1

Correlation Matrix of the Level 1 and Level 2 Variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Individual level (L2)																
1	Cognitive Salience	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Physical Salience	.42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Phone personalization	.20	.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Phone use self-regulation skills	-.64	-.47	-.20	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Age	-.06	-.08	-.05	.05	-	-	-	-	-	-	-	-	-	-	-	-
6	Age youngest child	.02	.00	.09	-.02	.28	-	-	-	-	-	-	-	-	-	-	-
7	Education	.07	.10	-.02	-.05	.12	-.16	-	-	-	-	-	-	-	-	-	-
8	Phone use frequency	.39	.36	.15	-.45	.03	.08	.01	-	-	-	-	-	-	-	-	-
	Situational level (L1)																
9	Phone use in stress	.18	.09	.08	-.16	-.01	.06	-.01	.14	-	-	-	-	-	-	-	-
10	Valence (phone content)[1]	-.06	-.01	-.04	.12	-.05	-.07	.16	-.12	NA	-	-	-	-	-	-	-
11	Semantic Affinity (phone content)[1]	.05	.03	.15	-.03	.11	.10	-.04	-.01	NA	.01	-	-	-	-	-	-
12	Perceived coping effectiveness	-.03	.01	.03	.00	.02	-.03	.07	-.04	.00	.22	.13	-	-	-	-	-
13	Stress T1	.02	-.01	.09	-.03	-.07	.05	-.15	.04	.03	.03	.11	-.19	-	-	-	-
14	Stress change	.07	.02	-.02	-.05	-.03	.00	-.02	.03	.08	-.10	-.03	-.16	-.37	-	-	-
15	Situational control	.02	.05	.01	-.03	.03	.01	.09	.00	-.03	.04	-.03	.31	-.20	-.01	-	-
16	Situational importance	-.01	-.02	.07	.01	-.06	.02	-.16	.03	.06	.07	.20	.02	.24	.04	-.12	-
17	Situational urgency	-.02	.01	.04	.03	.00	.01	-.06	-.01	-.04	.09	.14	.04	.35	-.10	.02	.35

Note. N(Level 2) = 218 participants, *N(Level 1)* = 1,655 stressful situations. Correlations between Level 2 variables are calculated on Level 2, all other correlations are calculated on Level 1. [1]Only for stressful situations including phone use, *n(Level 1)* = 483 stressful situations;.

Table A2

Coping Strategies in General and with Using a Phone

Coping strategies	General[1] (*n* = 1655)	Phone use[2] (*n* = 483)	General only for phone use situations[1] (*n* = 483)
Active coping	53 % (872)	16 % (79)	47 % (228)
Planning	38 % (626)	12 % (57)	37 % (178)
Venting	19 % (308)	8 % (40)	19 % (90)
Self-distraction	12 % (206)	49 % (237)	23 % (111)
Instrumental support	11 % (177)	12 % (60)	12 % (57)
Giving up	11 % (175)	13 % (61)	13 % (69)
Emotional support	10 % (173)	16 % (75)	14 % (69)
Positive reappraisal	9 % (153)	4 % (17)	9 % (44)
Take a break	9 % (153)	27 % (128)	13 % (64)
Nothing / Something else	8 % (137)	13 % (64)	7 % (35)
Information seeking	3 % (56)	13 % (62)	7 % (35)
Humor	3 % (46)	2 % (8)	3 % (13)
Information avoidance	2 % (39)	5 % (25)	4 % (17)

Note. [1]Question: "What did you do to deal with the stressful situation? Please check off all statements that apply to your thoughts and actions in the situation." [2]Question: "Have you used your smartphone for any of the following? Please check all statements that apply to your smartphone use."

Table A3

Multilevel Linear Regression Analysis on Coping Efficacy Including the Content Features (Final Models)

Dependent variable	**Perceived coping efficacy**			**Stress change**		
	Fixed effects			*Fixed effects*		
Parameters	Estimate	*SE*	*t*	Estimate	*SE*	*t*
Individual level						
Intercept	3.07	0.07	44.77	-0.93	0.07	-14.30
Age	0.00	0.02	0.08	-0.00	0.02	-0.05
Youngest child age	-0.01	0.05	-0.23	-0.04	0.04	-0.84
Education	0.12	0.14	0.82	-0.12	0.14	-0.88
Phone use frequency	-0.01	0.10	-0.06	0.08	0.09	0.80
Personalization	0.09	0.07	1.33	-0.01	0.06	-0.16
Phone self-regulation	-0.06	0.09	-0.64	0.09	0.08	1.03
Situational level						
Stress T1				-0.75	0.08	-9.96*
Effort	-0.06	0.07	-0.87	0.08	0.07	1.12
Urgency	0.06	0.07	0.82	0.11	0.06	1.77
Importance	-0.06	0.07	-0.87	0.14	0.06	2.48*
Control	0.25	0.06	4.32*	-0.15	0.05	-2.80*
Positive valence	0.17	0.07	2.51*	-0.04	0.06	-0.69
Semantic affinity	0.06	0.03	1.92	-0.01	0.03	-0.23
Interactions						
Positive valence*Control	-0.00	0.09	-0.01	-0.10	0.08	-1.20
Semantic affinity*Control	0.06	0.04	1.67	0.02	0.03	0.47
Positiv valence*Importance	-0.02	0.08	-0.23	0.03	0.08	0.33
Semantic affinity*Im-portance	-0.02	0.03	-0.48	0.03	0.03	0.86
Positiv valence*Urgency	0.17	0.09	1.78	-0.00	0.09	0.00
Semantic affinity*Urgency	-0.00	0.04	-0,06	-0.01	0.03	-0.23
R^2 (marginal/conditional)	.08/.28			.04/.37		
Random Intercept	*SD* = 0.53			*SD* = 0.53		

Note. 483 observations of 158 individuals. Individual-level predictors are grand mean centered, situation-level predictors are group mean centered. * |t| > 2.0, indicates a significant effect (Gelman & Hill, 2007)

Table A4

Hypotheses Overview

	Hypothesis / Research question	Result
RQ1	How often are phones used for coping with stress?	In about 30% of situations
RQ2	With which coping strategies do mothers combine mobile phones?	Mostly emotion-focused coping (see Table A2)
RQ3	Is phone use for coping associated with coping effectiveness?	No for perceived coping efficacy; Yes, associated with less stress decrease
H1	Mobile phones are used more frequently for coping if they are a) cognitively salient, b) physically salient,	H1a supported, H1b rejected
H2	Phone use self-regulation skills moderate the relationship between phone use for coping and coping effectiveness such that phone use for coping is more positively/ less negatively related to coping effectiveness for those with higher self-regulation skills.	Rejected
H3	Phones are a) used more and are b) more effective in stressful situations which are perceived as being more urgent.	Rejected
H4	Phones are a) used less and are b) less effective in stressful situations which are perceived as being more important.	Rejected
RQ4	Does the association of phone use for coping and coping effectiveness depend on the perceived situational control?	No
H5	Participants who have more strongly personalized their phone use it more often for coping.	Rejected
H6	Phone personalization moderates the relationship between phone use for coping and coping effectiveness such that phone use for coping is more positively/less negatively related to coping effectiveness for those who have more strongly personalized their phones.	Rejected
H7	In situations with lower situational control 7.1 more positive and 7.2 less stressor-related content is a) used more and is b) more effective.	Rejected
H8	In less important situations, 8.1 more positive and 8.2 less stressor-related content is a) used more and is b) more effective.	Rejected except H8.2a: supported
RQ5	Is there a relationship between content features and situational urgency?	No

PAPER 4

Does Guilt Influence the Effects of Parental Smartphone Use for Stress Coping? Results From a Mobile Experience Sampling Study of Mothers in Germany

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This paper will soon be submitted.

Open Science Statement / Supplemental Material

Supplemental material, data, and code for this article are available through OSF (https://osf.io/926hq/?view_only=35c4f0caa05942438c4efff039f52cad). The study has been preregistered at https://osf.io/2xypw/?view_only=1fa2de6be67447fa9fe96b7344eea40a.

Ethics statement

This research was approved by the ethics committee of the Leibniz-Institut für Wissensmedien, Tübingen, Germany (LEK 2020/047). All participants gave informed consent to participate in the study and agreed to the sharing of their anonymized data.

Abstract

Previous research linked smartphone use while parenting mainly to adverse consequences. However, smartphones also offer helpful resources for parents, especially in stressful situations. We suggest that negative norms against parental smartphone use and associated feelings of guilt may inhibit effective smartphone use for coping. In a one-week mobile experience sampling study with mothers of young children (N = 218), mothers answered four daily questionnaires about a recent stressful situation while parenting at fixed time points (N = 1655 situations). We found that more negative injunctive but not more negative descriptive norms were related to increased situational guilt around smartphone use. Increased situational guilt was in turn associated with decreased perceived coping efficacy but not with stress decrease. Situational guilt aggregated across situations on the individual level but not the frequency of situational phone use related to reduced satisfaction with the mother role. Our results have important implications for campaigns against parental smartphone use.

Does Guilt Influence the Effects of Parental Smartphone Use for Stress Coping? Results From a Mobile Experience Sampling Study of Mothers in Germany

In October 2019, the Australian cartoonist Michael Leunig published a cartoon of a mother pushing a stroller while looking at her phone; the mother does not see that her baby has fallen out of the stroller. The cartoon was accompanied by a poem that ends with the line saying that the baby wished it was "loved like a phone" (Leunig, 2019). In a similar vein, a poster campaign was launched in Germany in 2018, supported by the Drug Commissioner of the German government, asking parents whether they had already spoken to their child today. Similarly, different media reports emphasized the dangers of "distracted parenting" (e.g., The Atlantic: Christakis, 2018, Today's Parent: Halton, 2018). Overall, it seems that parental phone use while being with their children has a rather negative image. Adverse effects of parental phone use on parental sensitivity and parent-child interactions are also supported by a growing body of research (Braune-Krickau et al., 2021; McDaniel, 2019).

However, besides potential adverse effects, smartphones also incorporate many useful functions for parental everyday life (Lupton et al., 2016). Smartphones, for example, facilitate access to coping resources when individuals are confronted with a demanding and stressful situation: Whenever and wherever needed, advisors, friends, information but also possibilities to escape stressful circumstances are easily accessible (Schneider et al., 2018). Research has shown that parents use these resources (Radesky et al., 2016; Wolfers, 2021). In fact, because parents' opportunities to cope in stressful situations while being with their children are limited due to their childcare responsibilities, the resources provided by smartphones might be of particular value (Wolfers, 2021).

The idea that (digital) media use can have negative and positive effects on our everyday life is not new and certainly not limited to the parenting context (Kraut et al., 2002; Kushlev & Leitao, 2020; Meier & Reinecke, 2020). However, what has so far only received limited atten-

tion is that negative and positive effects are intertwined: A user's awareness about dangers associated with digital media use can introduce feelings of guilt and thereby reduce, for example, the effectiveness of phone use for coping. Such mitigation effects might particularly occur in moral-laden contexts, in which the public discussion focuses on the negative effects of digital media such as parenting. To test this idea, we conducted a preregistered mobile experience sampling study in Germany with over 200 mothers. Specifically, we tested whether social norms around parental smartphone use instigate feelings of guilt and whether guilt influences coping efficacy when parents use phones for coping. By employing experience sampling methods, we were able to assess feelings of stress and guilt, coping behaviors, and their effectiveness directly in or after the situation takes place, thereby providing a detailed look into smartphone use in parental everyday life.

Parenting, Parental Stress, and Coping

Stressful situations are characterized by a disbalance between the demands placed upon an individual and the resources available to the individual (Lazarus & Folkman, 1984). Especially parents of younger children experience many stressful instances or daily hassles throughout the day while caring for their children (Crnic & Greenberg, 1990). Many parents also have to cope with more important stressors such as financial difficulties, marital conflict, or illnesses (Nelson et al., 2014). High parenting stress has negative effects on parental wellbeing and can also adversely impact child development (Bakoula et al., 2009). Therefore, it is crucial that parents develop ways to cope with stressful situations successfully (Deater-Deckard, 2004).

Coping includes all “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). Ways of coping are usually classified into coping strategies such as social support, information seeking, or self-distraction (Compas et al., 2001). Recently, Wolfers and Schneider (2020) proposed to differentiate between coping strategies as the “objectives or intents of coping responses” (Compas et al., 2001, pp. 88-89) and

coping tools defined as “instruments through which (a) a coping goal can be achieved and (b) a coping behavior can be performed” (Wolfers & Schneider, 2020, p. 13). According to this conceptualization, individuals select coping strategies and coping tools when coping with a stressful instance.

Media are among these coping tools and they are widely used for coping with stress (Knobloch-Westerwick et al., 2009; Nabi et al., 2017). Television and Internet resources can, for example, be used to distract oneself from the stressful daily life, but media can also be used to search for information and guidance about a stress-evoking problem as well as for seeking social support (Knobloch-Westerwick et al., 2009; van Ingen et al., 2016). The advent of smartphones makes these media-based resources now directly available in most stressful situations (Carolus et al., 2019; Lupton et al., 2016).

Smartphones might provide particularly valuable resources for parents' coping with stress. Parents of young children experience many “time-space constraints” (Frantál & Klapka, 2020, p. 402), as parents experience higher barriers to freely choose where and how they spent their time because of the responsibility to care for dependent others. This is particularly true for mothers who still are the primary caregivers in most societies (Craig & Mullan, 2011) and, therefore, should experience more stressful situations while caregiving. Time-space constraints while parenting limit mothers' opportunities to cope with stress, as it is, for example, harder to leave a room to calm down or to go jogging to reduce stress. This underlines the benefits of easy-to-use and always available coping tools such as smartphones (Wolfers, 2021).

Parental Smartphone Use

Research on parental phone use for coping is still in its early stages, although some studies indicate the importance of stress for parental smartphone use (McDaniel, 2021; Radesky et al., 2016; Wolfers, 2021). Previous research on parental use of smartphones and Internet resources has instead mainly addressed two questions. First, researchers have investigated why and how parents use Internet resources and how this use influences the parents themselves (for

overviews, see Dworkin et al., 2013; Lupton et al., 2016). Research, for example, investigated how parents search for parenting information online (e.g., Bernhardt & Felter, 2004) and how they use online support groups on social networking sites (e.g., Ruthven et al., 2018). These studies found that parents describe the different resources provided by smartphones and digital media as a first source of information and support and evaluated them as valuable and helpful (Dworkin et al., 2013; Lupton et al., 2016; Wolfers, 2021).

As a second research line, researchers have started to assess how interference and distraction caused by smartphones have influenced parent-child interaction and child outcomes (for overviews, see Braune-Krickau et al., 2021; McDaniel, 2019). For this kind of interference, the term technoference was coined, describing "everyday interruptions in interpersonal interactions or time spent together that occur due to digital and mobile technology devices" (McDaniel & Radesky, 2018, p. 100). Several studies found that smartphone use during time spent with children related to decreased parental sensitivity or less parent-child communication (Lemish et al., 2020; Wolfers et al., 2020). Studies moreover showed that more frequent technoference was also related to more child behavioral problems (McDaniel & Radesky, 2018) and lower child satisfaction regarding the relationship with their parents (Meeus et al., 2021).

While these two research lines have emerged rather independently, the investigated processes are certainly intertwined. If parents use their smartphones successfully to decrease their stress level and to find valuable parenting information, this is likely to be indirectly related to a better parent-child relationship, more positive parent-child communication, and more beneficial child outcomes. In addition, negative outcomes commonly associated with parental phone use can have adverse effects on the association between parental smartphone use and wellbeing. The overall negative media coverage of parental phone use and campaigns against parental smartphone use (e.g., Christakis, 2018; Drug Commissioner of the German Government, 2017; Leunig, 2019) might have created negative social norms. Indeed, a recent focus group study showed that parents experience phone use while parenting as a violation of social norms

(Wolfers, 2021). Importantly, being aware of those negative social norms regarding parental phone use might trigger feelings of guilt which, in turn, might influence coping effectiveness when parents use phones for coping. In this paper, we explored this effect through social norms and guilt in the context of parental phone use for coping with stress.

Norms, Guilt, and a Social Constructivist Viewpoint on Media Use

Social constructivist approaches to media adoption argue that not only objective characteristics of a media technology (e.g., appearance, functionality) influence its adoption and use. It is instead assumed that also socially constructed perceptions of a media technology play a central role (Campbell & Russo, 2003; Fulk et al., 1990). In their social influence model of media use, Fulk et al. (1990) conceptualized group norms as a critical factor of social influence, impacting an individuals' media evaluation and use. Wolfers et al. (2021) propose to extend the social constructivist approach to the effects of media use, assuming that socially constructed media perceptions shape *media effects* in addition to influencing media use and adoption. Adopting this social constructivist view, we investigated the role of norms about smartphone use while parenting. We assume that social norms influence the effects of parental smartphone use on coping success via evoking guilt.

In a qualitative study with mothers in Germany, Wolfers (2021) found that norms on smartphone use while parenting are rather strong. Mothers judged other parents who used their phones while being with their children very negatively, showing that phone use while parenting is not entailed in the societal judgment of a “good parent” or a “good mother” (see Collins, 2021; May, 2008; Sutherland, 2010 on descriptions of societal judgments of a “good mother”). However, norms in the context of parental phone use have received little attention so far and have, to our knowledge, not been studied quantitatively.

In this paper, we focused on perceived norms, that is, the “perceptions about the prevalence of behavior and pressures to conform” (Chung & Rimal, 2016, p. 7). The perceived prevalence of a behavior refers to the so-called descriptive norms, while injunctive norms describe

the perceived moral judgments of others about a particular behavior (Chung & Rimal, 2016; Cialdini et al., 1990). Usually, perceived norms are raised with regard to different, more close or distant reference groups. Studies either directly referred to specific groups such as friends and family members or they more unspecifically referred to significant others (Chung & Rimal, 2016). Following Fulk et al. (1990), we investigated norms with respect to significant others.

A violation of norms can result in feelings of guilt (Sutherland, 2010). Guilt is a self-conscious emotion (Tracy & Robins, 2004) defined as the "dysphoric feeling associated with the recognition that one has violated a personally relevant moral or social standard" (Kugler & Jones, 1992, p. 318). In contemporary western cultures, maternal feelings of guilt have been described as a "natural component of motherhood" (Sutherland, 2010, p. 310). They are mostly evoked in conjunction with behavior that is perceived as deviating from the societal or own standard of a "good mother" (Sutherland, 2010, p. 310, see also Collins, 2021; Seagram & Daniluk, 2002). We assume that mothers who report more negative norms around phone use while parenting also experience increased feelings of guilt when using their smartphones for coping purposes. Studies showed that both the prevalence of a behavior (e.g., Giguère et al., 2014) and perceived moral judgments about a behavior (e.g., Russell et al., 2021) are associated with increased guilt. Thus, we assume that mothers who think that less other parents use their phone while parenting (stronger descriptive norms against phone use) and that more significant others judge phone use while parenting as morally reprehensible (stronger injunctive norms against phone use) experience more guilt when they use their smartphone for coping while being with their children.

H1: Participants who report stronger a) descriptive and b) injunctive norms about not using phones while parenting report more situational guilt about phone use for coping.

Guilt about entertainment media use (i.e., video games, TV, non-work-related Internet use) has been shown to cause the mitigation of potential positive consequences of media use (Reinecke et al., 2014; Reinecke & Hofmann, 2016). Reinecke et al. (2014), for example,

showed that appraising entertainment media use as a form of procrastination increased feelings of guilt related to media use. Feelings of guilt, in turn, reduced the recovery from stress participants experienced (Reinecke et al., 2014). We assume that a similar effect also applies to using smartphones for coping with stress. Feelings of guilt can be seen as a stressor (Denson et al., 2009). Thus, even if parents use their phones successfully to cope with a stressful situation, feeling guilty about using the phone might introduce additional feelings of stress, reducing the coping effectiveness of phone use.

H2: Situational guilt about smartphone use is associated with lower situational coping effectiveness.

In some situations, individuals may, however, be able to justify smartphone use. Smartphone use might, for example, be less associated with guilt or guilt might impact coping efficacy less if a situation is urgent or important. In these situations, balancing the benefits of immediate smartphone use for stress management against the potential adverse effects on children might be easier. Indeed, qualitative studies about maternal guilt showed that guilt decreased if a seemingly deviant behavior could be rationalized (Sutherland, 2010). Such rationalization might also be easier in situations characterized by high individual control. We, therefore, additionally explored if situational factors (importance, urgency, control) moderate the relationship of norms on guilt (H1) and of guilt on coping efficacy (H2).

RQ1: Does the association between norms and situational guilt and between situational guilt and coping effectiveness depend on situational factors of the stressful situation (importance, urgency, control)?

Guilt Around Parental Smartphone Use, Smartphone Use, and the Parent-Child Relationship

In addition to investigating the effect of guilt on situational coping effectiveness, we also looked into broader outcomes of guilt around smartphone use with regard to the outcomes of phone use for coping while parenting. We explored these effects both on a situational level and an individual level.

On a situational level, we expected that guilt around parental smartphone use is related to the perception that smartphone use has negatively impacted situational parent-child interactions. Guilt is an emotion that is conceptualized as being tied to a specific behavior that is incongruent with personal important goals or standards or expectations (Tracy & Robins, 2004). Having done something such as using the smartphone that an individual assumes to associate with more negative mother-child interactions thus might be a guilt-evoking behavior.

H3: A higher situational guilt is related to more perceived negative influences of smartphone use on the situational parent-child interaction.

Moreover, we assume that feelings of guilt about smartphone use also alter the overall perception of the mother-child relationship and maternal satisfaction with the mother role. Maternal guilt results from an unfavorable comparison between a mental representation of the ideal mother and the perception of the actual self (Prikhidko & Swank, 2018). We, therefore, assume that more frequent feelings of guilt about smartphone use are associated with less satisfaction regarding the mother role on the individual level (Collins, 2021).

H4: A higher guilt (aggregated on the individual level) about smartphone use is related to lower satisfaction with the mother role.

While feeling guilty should be negatively related to general role satisfaction, it is less clear if the smartphone use itself also has such an influence. Successful use for coping could be associated with greater role satisfaction since parental smartphone use can support parents in performing their parenting role (Lupton et al., 2016). However, as previous research has also reported that smartphone use can cause distraction from being a parent (McDaniel, 2019), a negative association is conceivable as well. We, therefore, openly assess:

RQ3: Is more frequent smartphone use for coping associated with satisfaction with the mother role?

Regarding relational outcomes, we looked at the effects of maternal smartphone use for coping and guilt around smartphone use on the mother-child relationship quality. There are two

reasons to assume a negative relationship between maternal feelings of guilt and the maternal evaluation of the parent-child relationship quality. First, qualitative and quantitative studies have suggested that maternal guilt shapes how mothers see themselves (Collins, 2021; Liss et al., 2013). It seems likely that this negative self-evaluation transfers to the maternal perception of her relationship with her child. Additionally, negative maternal emotions have been associated with more harsh and dysfunctional parenting behaviors (Dumas & Wekerle, 1995; Lorber & Slep, 2005), which might also apply to the negative emotion of guilt. Parents who reported higher parental burnout, including the "feeling that you are not good enough as a parent," also reported showing more anger toward their child (Prikhidko & Swank, 2020, p. 283). We aim at testing if these more general associations also transfer to the specific context of parental guilt around smartphone use and therefore test the assumption:

H5: A higher guilt (aggregated on the individual level) about smartphone use is related to lower perceived parent-child relationship quality.

Studies finally assumed that maternal phone use distracted from and interrupted parent-child interactions (Lemish et al., 2020; Wolfers et al., 2020). Thus, also smartphone use for coping might be associated with a worse mother-child relationship. Only very few studies have differentiated between different reasons for using a phone when assessing influences on parent-child interactions (Wolfers et al., 2020). In addition, researchers often measured the frequency of phone use interference (technoference) instead of the frequency of the phone use itself (e.g., McDaniel & Radesky, 2018). As previous research mostly suggested that phone use and technoference both are associated with a worse parent-child relationship quality, we assume:

H6: More frequent smartphone use for coping is associated with a worse mother-child relationship quality.

H7: A higher situational assessment of negative smartphone influences on the mother-child interaction (aggregated on the individual level) is related to a worse mother-child relationship quality.

All hypotheses and research questions were preregistered at https://osf.io/2xypw/?view_only=1fa2de6be67447fa9fe96b7344eea40a.

Methods

Procedure and Sample

Procedure

To test our hypotheses, we conducted an experience sampling study with German mothers using the smartphone application movisensXS version 1.5.8 (movisens GmbH, 2020). The application was developed for Google's operating system Android, which in 2020 had a market share in Germany of about 81% (Kantar Worldpanel, 2021). Mothers who were interested in participating in the study were first directed to a Qualtrics questionnaire. They received detailed information about the study design, participation criteria, and the movisensXS application. Mothers who gave their consent to participate then received a step-by-step guide about how to install the app on their smartphones and how to adapt their smartphone settings so the app can function properly. Respondents could start the study between November 4, 2020, and November 23, 2020. In the beginning, participants filled out a presurvey. In the experience sampling period, participants received four daily questionnaires for seven days resulting in a maximum of 28 completed questionnaires per participant. At the end of the study, participants answered a postsurvey. Following the results of van Berkel (2019) on incentive remuneration schemes, participants received €10 for installing the app and completing the presurvey questionnaire, €0.85 for each completed daily questionnaire, and €5 for completing the postsurvey. Participants who completed at least 20 daily questionnaires received a bonus of €10, resulting in a maximum remuneration of €48.80 per participant.

On the situational level, we aimed at capturing stressful situations while mothers were together with their children. Stressful situations are common, concrete events in the everyday lives of parents (Crnic & Booth, 1991). Still, stressful situations should not happen constantly and might thus be infrequent when random sampling of time points is used (Wheeler & Reis,

1991). Although stressful events should be remembered more easily than, for example, a mood state (Wheeler & Reis, 1991), Wolfers (2021) reported that recall could be difficult when parents report on their smartphone use for coping with stress. Based on these considerations, we used a quasi-experience sampling design (Schnauber-Stockmann & Karnowski, 2020) with surveys at fixed time points, which is recommended for concrete, infrequent events (Conner & Lehman, 2012; Scollon et al., 2003). However, we asked participants to only report about the last two hours before filling in the questionnaire to minimize recall errors. Reminders for the daily questionnaires were sent at predefined time points every day at 9 a.m., at 12.30 p.m., at 4 p.m., and at 7.30 p.m.. Participants were able to delay answering the survey by up to 35 minutes. The ethics committee of the Leibniz-Institut für Wissensmedien in Tübingen approved the study (LEK 2020/047). All materials, data, and preregistration can be found on OSF (https://osf.io/926hq/?view_only=773d34cdd20c4f829044528e69d827c8).

Participants and Situations

We recruited mothers whose youngest child was born on or after January 1, 2014. We used various channels to recruit participants, including social media posts and advertisements (Twitter, Facebook parenting groups, Facebook advertising, parenting subreddits on Reddit), personal contacts, snowball sampling, and notices at daycare centers and supermarkets. We also contacted daycare and family centers in different locations in Germany and asked them to distribute our survey link via the mailing lists of their parents.

Overall, 234 mothers downloaded the app and participated in our presurvey, which was higher than the minimum sample size of 200 we had preregistered. We collected 4,965 daily questionnaires resulting in an overall compliance rate of 76% (range: 0-100%). In 2,038 instances (41%), stressful situations were reported. Participants reported being with their children while experiencing stressful situations in 1,659 instances (33% of all reported situations). Four of these questionnaires were incomplete and thus excluded. A phone was used in overall 483 (29%) stressful situations in which the children were present. Five participants only filled in the

presurvey and eleven participants did not report on any stressful situation while being with their children and were, thus, excluded from the analyses. We preregistered only to use data of participants who reported on at least three stressful situations to ensure robust estimation of the multilevel models. However, this would have led to the exclusion of 28 individuals. Simulation studies have shown that multilevel models can also be estimated with small numbers of situational (Level 1) cases (Bell et al., 2010; Maas & Hox, 2005). Thus, we decided to deviate from our preregistration and to use the data of all participants who reported on at least one stressful situation while being with their children.

The final sample contained 218 mothers. They were on average 33.10 years old (*SD* = 4.22) and had between 1 and 5 children (*M* = 1.70, *SD* = 0.88). The youngest child was on average 1.78 years old (*SD* = 1.52, range: 0-6). The sample was well-educated, with 61% holding at least a Bachelor's degree (cf. 31% for women between 30 and 35 in the general German population, Autorengruppe Bildungsberichterstattung, 2020). The majority (90%) of mothers lived together with the parent of (at least) one of their children. A small proportion of mothers (8%) were single mothers or lived with other family members or a partner who was not the parent of their child (6%; choices were not exclusive). About half of the sample (45%) were on parental leave or stayed at home full-time and about a third (34%) worked part-time. About 8% were in an educational program and 9% worked full time (13% for mothers with a child under 6 in a representative German sample, Keller & Kahle, 2018). All participants indicated to use their smartphones more often than once per day.

Measures

Presurvey

In the presurvey, mothers answered questions about demographics, general traits (e.g., stress trait), smartphone use, and perceived norms about phone use. In this paper, we only use a subset of all measures asked in the different questionnaires. An overview of all measures can be found on OSF.

Norms About Parental Phone Use. Descriptive norms about phone use while parenting were measured in the presurvey with two items based on White et al. (2009). Participants were asked how many of the parents, who are important to them, use their smartphone often while they are with their children or will use their smartphone in the next week while being with the children on a scale from 1 (*none*) to 7 (*all*). Both items were combined (M = 5.33, SD = 1.21, r_{items} = .67).

Injunctive norms about phone use while parenting were measured with a semantic differential as in Paek (2009). We asked how mothers think other people who are important to them would judge phone use while parenting on a 9-point scale, using four word pairs (negative/positive, bad/good, harmful/helpful, inappropriate/appropriate). All items were combined in a mean index (M = 3.46, SD = 1.29, α = .90). Lower values indicate more negative evaluations of phone use while parenting.

General Smartphone Use Frequency. As a control variable, we measured general smartphone use frequency by asking respondents in the presurvey how often they use their smartphones on a scale from 1 (*never*) to 5 *(all the time*, M = 3.99, SD = 0.79).

Postsurvey

In the postsurvey, mothers answered questions concerning their satisfaction with the mother role, parent-child satisfaction, and child characteristics.

Role Satisfaction. To measure role satisfaction, we used the Parenting Satisfaction and Efficacy Scale by Johnston and Mash (1989) in the German translation of Kabakçı-Kara (2009). Parents indicated how much they agreed with ten statements on a scale from 1 (*do not agree*) to 5 (*fully agree*; M = 3.52, SD = 0.61, α= .72). An example item is: “I honestly believe I have all the skills necessary to be a good mother to my child.”

Parent-Child Relationship Quality. We asked about parent-child relationship quality only for one of a mother's children. If mothers had more than one child in the age range between 3-7 years, they were instructed to report on the child between 3 and 7 whose birthday was most

recently. If a mother did not have a child between 3 and 7, she reported on her oldest child under 3. The mean age of the children for whom the measure was answered was 2.86 years (*SD* = 1.94). For parent-child relationship quality, mothers indicated their agreement with ten items from the maternal perspective scale of Müller and Achtergarde (2018) on a scale from 1 (*do not agree*) to 5 (*fully agree, M* = 4.33, *SD* = 0.45, α= .81). Items included statements such as "I believe my child trusts me" or "My child and I have many conflicts."

Situational Questionnaires

For the situational questionnaires, participants first reported if they experienced a stressful situation in the last two hours. When they indicated "yes," participants were asked about their experienced stress and emotions, stressors, and situational characteristics (e.g., urgency, importance, control). Afterward, they were asked how they coped with the stress, whether they used their smartphone during the situation, and how they felt about using their smartphone. In the end, they indicated experienced coping efficacy and if their smartphone interfered with the interactions with their children. We explain the measures in more detail below.

Phone Use in Stressful Situations. We measured phone use in stressful situations directly using a dichotomous variable (*yes*/*no*). Mothers were asked to only answer with *yes* if they used their phones themselves so that giving their phone to their child to cope with stress was omitted. For aggregating smartphone use for coping, we used the ratio between the number of situations in which a smartphone was used and the total number of stressful situation-questionnaires answered (*M* = 0.27, *SD* = 0.25).

Guilt About Phone Use. We measured guilt about using the phone with three items of the scale of Halfmann et al. (2021) on a scale from 1 (*does not apply*) to 5 (*does fully apply*; *M* = 2.24, *SD* = 1.01, α = .78, example item: "I had a bad conscience"). For aggregation on the person-level, we built a mean score for each individual of all situations for which the item was answered (*M* = 2.23, *SD* = 0.60, range 0–3.67).

Perceived Coping Efficacy and Stress Change. For measuring coping efficacy, we used two instruments, perceived coping efficacy and stress change. Perceived coping efficacy was measured by asking: "Did what you have thought or done in the situation make you feel better?" on a scale from 1 (*it did not help*) to 5 (*it did help a lot*; *M* = 3.05; *SD* = 1.16). We calculated stress change by subtracting stress intensity reported at the beginning from reported stress intensity after the situation had ended, each on a scale from 1 (*not at all)* to 5 (*very much*). Thus, negative values indicate a stress decrease. If the situation had not ended yet, participants were asked to rate how stressed they feel at the moment (*M* = -1.05; *SD* = 1.12, range -4–3).

Perceived Phone Influence on the Parent-Child Interaction. Perceived phone influence on parent-child interactions was measured by asking participants to rate two items on a semantic differential. In the first item they reported if their smartphone use had a positive influence on how they interacted with their child(ren) (*M* = 2.69; *SD* = 1.27) and in the second item they indicated a negative impact (*M* = 2.05; *SD* = 1.14, *r* = -.18) on the parent-child interaction during the situation on a 5-point-scale from 1 (*do not agree*) to 5 (*fully agree*). We included the first item to ensure that our questionnaire did not introduce guilt. It was, as preregistered, not used in the analysis. For the person-level aggregation, we built a mean score of all situations, in which the item about a negative impact was answered (*M* = 2.02; *SD* = 0.98, range 1-5).

Situational Characteristics. We measured situational control by asking participants if they felt they could influence the situation on a scale from 1 (*not at all*) to 5 (*very much*) based on Perrez and Reicherts (1992); *M* = 2.76, *SD* = 1.13). To measure situational importance, mothers indicated the importance of the stress-inducing problem on a scale from 1 (*not important*) to 5 *(very important;* Thies & Kordts-Freudinger, 2019; *M* = 3.00, *SD* = 1.21). Urgency was measured asking participants how urgent they needed to act in the situation on a scale from 1 (*not at all*) to 5 (*very much; M* = 3.59, *SD* = 1.05).

Analysis

To account for the nested structure (timepoints nested within individuals), we used multilevel regression modeling for situational dependent variables (i.e., guilt around phone use, coping efficacy, perceived phone influence on parent-child interactions), including a random intercept. For the fixed effects, we used a hierarchical procedure. We first introduced the random intercept and the control variables. In the next step, we introduced the fixed effects of the independent variables of interest. In a last step, interactions of interest were introduced. We test hypotheses based on model comparisons with and without the respective predictor variable in the respective step using a likelihood ratio test with a $p < .05$ significance level using Full-Maximum-Likelihood estimation (ML). The final model is estimated based on the more robust restricted maximum likelihood estimation (REML, see Zuur et al., 2009). We use a $|t| > 2$ for the respective predictor in the final models as an additional criterium for hypothesis support (Gelman & Hill, 2007). For the linear models, we calculated model comparisons using a similar hierarchical procedure using F-ratios. Significant slope coefficients are again used as additional criterium for hypothesis support.

Building on Enders and Tofighi (2007), we group-mean centered the timepoint-level variables (level 1) and grand-mean centered the individual-level variables (level 2). We used R (version 4.0.3, R Core Team, 2020) and the package lme4 (version 1.1.26; Bates et al., 2015). We used multiple linear regression modeling employing a similar hierarchical procedure for the dependent variables on the individual level (i.e., role satisfaction, parent-child relationship quality). For these analyses, we aggregated situational variables to the individual level. We preregistered the procedure and the final models. The preregistration, a summary of deviations from the preregistration, the data, and R code can be found on OSF. We checked the assumptions of all models looking at residual plots and variance inflation factors (see OSF). Table 1 shows the correlations of the variables.

Table 1

Correlations Matrix of the Level 1 and Level 2 Variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Individual Level (L2)																
1	Role satisfaction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Parent-child relationship satisfaction	.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Descriptive norms[1]	.01	-.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Injunctive norms[1]	.11	.00	.18	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Age	-.18	-.22	-.03	.05	-	-	-	-	-	-	-	-	-	-	-	-
6	Age youngest child	.01	-.13	-.02	-.05	.28	-	-	-	-	-	-	-	-	-	-	-
7	Education	-.01	.03	-.06	-.08	.12	-.16	-	-	-	-	-	-	-	-	-	-
8	Phone use frequency	-.18	-.04	-.02	.03	.03	.08	.01	-	-	-	-	-	-	-	-	-
	Situational level (L1)																
9	Phone use in stress	-.08	-.04	-.01	.07	-.01	.06	-.01	.14	-	-	-	-	-	-	-	-
10	Guilt around phone use[2]	-.29	-.16	.03	-.11	-.05	.08	-.06	.12	NA	-	-	-	-	-	-	-
11	Negative phone influence[2]	-.21	-.10	.01	-.15	.06	.07	.09	.14	NA	.43	-	-	-	-	-	-
12	Perceived coping effectiveness	.12	.08	-.01	.01	.02	-.03	.07	-.04	.00	-.25	-.13	-	-	-	-	-
13	Stress T1	-.10	-.09	.04	-.03	-.07	.05	-.15	.04	.03	.02	.04	-.19	-	-	-	-
14	Stress change	-.02	-.02	.03	.04	-.03	.00	-.02	.03	.08	.19	.17	-.16	-.37	-	-	-
15	Situational control	.10	.02	-.02	-.05	.03	.01	.09	.00	-.03	-.04	.04	.31	-.20	-.01	-	-
16	Situational importance	.01	.07	.03	.01	-.06	.02	-.16	.03	.06	-.11	-.05	.02	.24	.04	-.12	-
17	Situational urgency	-.06	-.03	.05	-.01	.00	.01	-.06	-.01	-.04	.04	-.03	.04	.35	-.10	.02	.35

Note. *N(Level 2)* = 218 participants, *N(Level 1)* = 1655 stressful situations. Correlations between Level 2 variables are calculated on Level 2, all other correlations are calculated on Level 1. [1] Higher values indicate more positive norms toward phone use while parenting. [2]Only for stressful situations including phone use, *n(Level 1)* = 483 stressful situations.

Results

Descriptive Results

Looking at the descriptive results on norms and guilt, most mothers perceived that most other parents use their phones frequently while being together with their children (M = 5.33, SD = 1.21). The mean for the injunctive norms indicated that mothers perceived others to judge phone use while parenting as inappropriate (M = 3.46, SD = 1.29, scale midpoint is 5). Only a small proportion of mothers (8%) perceived that people who are important to them judge parental phone use as positive. A least some feelings of guilt about phone use (values > 1, *does not apply*) were reported in 85% of situations that involved phone use. In 19% of the situations, mothers reported a higher amount of guilt (values > 3, on the five-point Likert scale).

Explaining Situational Guilt

Turning to the hypotheses, we proposed in H1 that individuals who reported stronger descriptive and injunctive norms against using phones while parenting also reported higher situational guilt for using their phone in stressful situations. Contrary to H1a, we did not find a significant influence of descriptive norms: The model including descriptive norms did not explain additional variance compared to the models including the control variables (χ^2 = 0.05, p = .818, for coefficients of the final model see Table 2). H1b, however, was supported: stronger perceived injunctive norms significantly predicted higher situational guilt (χ^2 = 7.96, p = .005). Looking at situational characteristics, the importance of the situation was associated with less guilt (χ^2 = 7.78, p = .005), while situational control (χ^2 = 1.22, p = .270) and urgency (χ^2 = 0.16, p = .687) did not relate to experienced guilt for using a smartphone while parenting. In RQ1, we asked if the association assumed in H1 depends on these situational characteristics. Interactions between descriptive norms and situational characteristics were not significant (importance: χ^2 = 0.02, p = .890, control: χ^2 = 0.55, p = .459, urgency: χ^2 = 1.36, p = .244). Situational control (χ^2 = 0.15, p = .902) and urgency (χ^2 = 0.11, p = .739) did not moderate the

Table 2

Multilevel Linear Regression: Situational Guilt for Phone Use (Final Model)

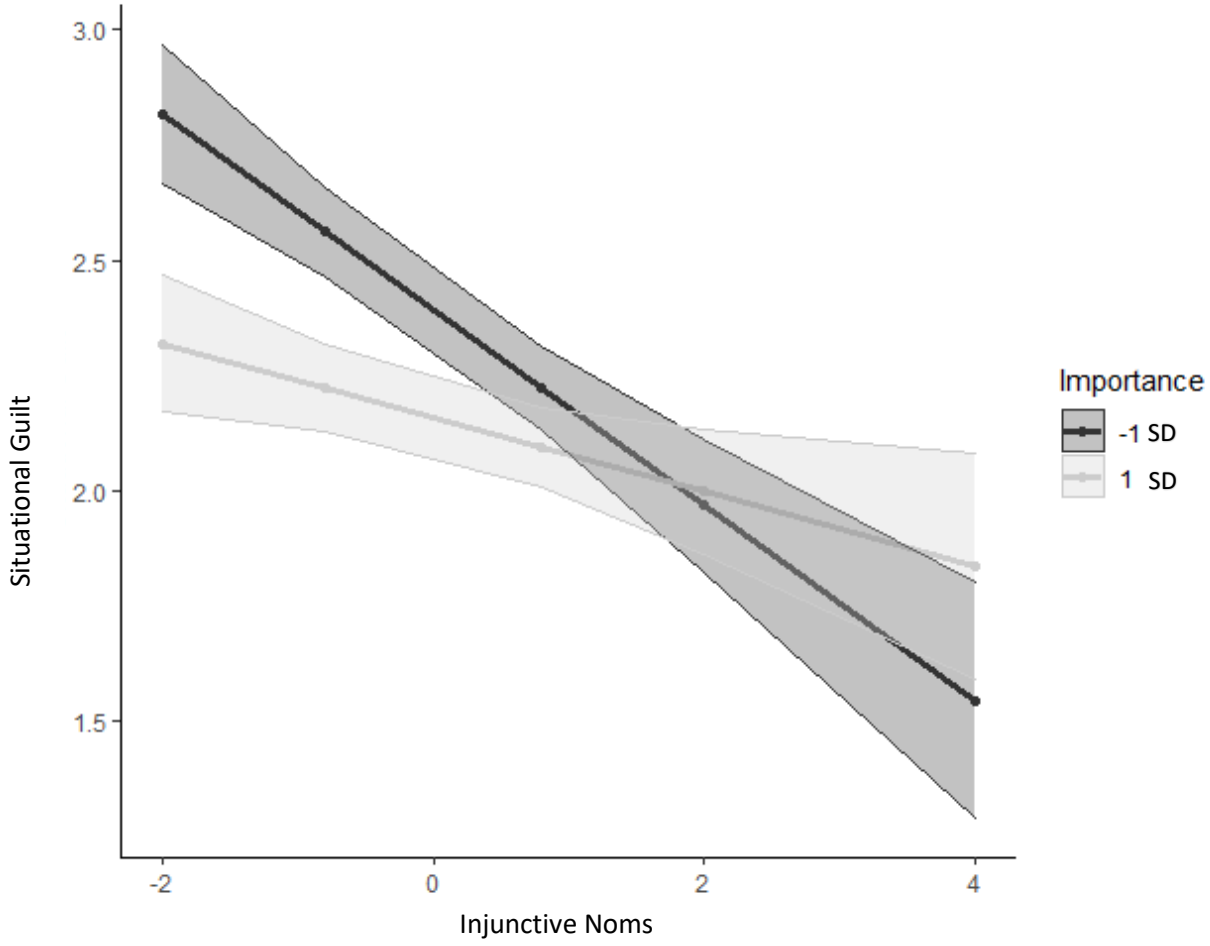
	Fixed effects		
Parameters	Estimate	*SE*	*t*
Individual level			
Intercept	2.24	0.07	34.29*
Age	-0.02	0.02	-1.44
Youngest child age	0.05	0.04	1.03
Education	0.01	0.14	0.08
Phone use frequency	0.12	0.08	1.46
Descriptive Norms[1]	0.01	0.06	0.13
Injunctive Norms[1]	-0.14	0.05	-2.79*
Situational level			
Urgency	0.02	0.05	0.40
Importance	-0.12	0.04	-2.73*
Control	-0.08	0.04	-1.98
Interactions			
Descriptive * Urgency	-0.05	0.04	-1.35
Descriptive * Importance	0.01	0.04	0.16
Descriptive * Control	-0.02	0.03	-0.46
Injunctive * Urgency	0.01	0.03	0.34
Injunctive * Importance	0.07	0.03	2.04*
Injunctive * Control	0.02	0.03	0.57
R^2 (marginal/conditional)		.07/.44	
Random Intercept		*SD* = .62	

Note. 483 observations of 158 individuals. [1]A higher level indicates higher use/acceptance of phone use among important others. Individual-level predictors are grand mean centered, situation-level predictors are group mean centered. Model formula: guilt.phoneuse ~ 1 + (1|participant) + age.mother + age.youngest.child + spu.general + educ.mother + norm.desc + norm.inj + urgency + importance + control + norm.desc * urgency + norm.desc *importance + norm.desc *control + norm.inj * urgency + norm.inj *importance + norm.inj *control.
* |t| > 2.0, indicating a significant effect Gelman and Hill (2007).

association between injunctive norms and situational guilt for using phones. Situational importance, however, significantly moderated this association ($\chi^2 = 4.54$, $p = .033$). The relationship between injunctive norms and situational guilt was smaller for higher levels of situational importance (see Figure 1).

Figure 1

Interaction Between Injunctive Norms and Situational Importance in Predicting Situational Guilt



Note. $N = 483$ observations of 158 individuals. Regression lines shown for one standard deviation (SD) below and one standard deviation above the mean. Individual-level predictors are grand mean centered, situation-level predictors are group mean centered.

Explaining Situational Coping Effectiveness

H2 predicted that higher situational guilt about phone use is associated with lower situational coping effectiveness. In support of H2, for situations in which the smartphone was used, situational guilt about phone use was a significant negative predictor of perceived coping efficacy ($\chi^2 = 15.56$, $p < .001$). Unsurprisingly, perceived coping efficacy was rated higher in situations with higher control ($\chi^2 = 16.57$, $p < .001$). Neither importance ($\chi^2 = 2.21$, $p = .137$) nor urgency ($\chi^2 = 1.32$, $p = .251$) were related to perceived coping efficacy. In RQ1, we asked if the relationship between situational guilt about phone use and coping efficacy would depend on situational characteristics. None of the interaction effects was a significant predictor of perceived coping efficacy (control: $\chi^2 = 0.36$, $p = .549$; importance: $\chi^2 = 0.03$, $p = .867$; urgency: $\chi^2 = 0.24$, $p = .626$).

For stress change, H2 was not supported. Descriptively, situational guilt was associated with less stress decrease but the association was not significant ($\chi^2 = 0.88$, $p = .348$). Similarly to perceived coping efficacy, increased situational control lead to a higher stress decrease ($\chi^2 = 11.90$, $p < .001$). Higher situational importance and urgency were associated to a lower stress decrease (importance: $\chi^2 = 15.83$, $p < .001$; urgency: $\chi^2 = 8.82$, $p = .002$). The situational characteristics did not significantly moderate the association predicted in H2 (control: $\chi^2 = 0.68$, $p = .411$; importance: $\chi^2 = 1.50$, $p = .221$; urgency: $\chi^2 = 1.20$, $p = .274$). Table 3 shows the estimates of the final models for both variables.

Table 3

Multilevel Linear Regression: Coping Efficacy, Stress Change, and Perceived Phone Influence on Parent-Child Interactions (Final Models)

Dependent variable	**Perceived coping efficacy**			**Stress change**			**Negative influence on parent-child interactions**		
	Fixed effects			*Fixed effects*			*Fixed Effects*		
Parameters	Estimate	*SE*	*t*	Estimate	*SE*	*t*	Estimate	*SE*	*t*
Individual level									
Intercept	3.06	0.07	44.09*	-0.92	0.06	-15.12*	1.99	0.07	27.33*
Age	0.00	0.02	0.07	0.01	0.02	0.49	-0.00	0.02	-0.16
Youngest child age	-0.00	0.05	-0.10	-0.03	0.04	-0.67	0.03	0.05	0.63
Education	0.13	0.15	0.90	-0.16	0.13	-1.25	0.32	0.15	2.05*
Phone use frequency	0.04	0.09	0.42	0.04	0.08	0.48	0.20	0.09	2.13
Situational level									
Stress T1				-0.74	0.06	-11.44*			
Guilt about phone use	-0.30	0.07	-4.06*	0.09	0.07	1.30	0.33	0.06	5.27*
Control	0.18	0.05	3.32*	-0.15	0.05	-3.12*	-0.02	0.05	-0.48
Importance	-0.10	0.05	-1.83	0.15	0.05	2.91*	-0.02	0.05	-0.42*
Urgency	0.07	0.06	1.14	0.16	0.05	2.97*	-0.01	0.51	-0.22
Interactions									
Guilt * Control	-0.06	0.08	-0.70	0.05	0.07	0.65	0.08	0.07	1.12
Guilt * Importance	-0.03	0.08	-0.37	-0.05	0.07	-0.59	-0.20	0.07	-2.75*
Guilt * Urgency	0.05	0.10	0.48	-0.10	0.09	-1.07	0.01	0.09	0.11
R^2 (marginal/conditional)	.06/.28			.21/.37			.09/.45		
Random Intercept	*SD* = 0.56			*SD* = 0.46			*SD* = 0.70		

Note. 483 observations of 158 individuals. Individual-level predictors are grand mean centered, situation-level predictors are group mean centered. Model formula: DV ~ 1 + (1|participant) + age.mother + age.youngest.child + spu.general + educ.mother + guilt + urgency + importance + control + guilt * urgency + guilt *importance + guilt*control. * |t| > 2.0, indicating a significant effect Gelman and Hill (2007).

Table 4

Linear Regression Analysis: Role Satisfaction and Parent-Child Relationship Quality

Dependent variable	**Role satisfaction**					**Parent-child relationship quality**				
Parameters	*b*	*SE*	*t*	*p*	β	*b*	*SE*	*t*	*p*	β
Individual level										
Intercept	5.40	0.51	10.65	<.001	.00	5.11	0.37	13.65	<.001	.00
Age	-0.03	0.01	-2.60	.010	-.22	-0.02	0.01	-1.76	.081	-.15
Youngest child age[1] / age of child on which was reported[2]	0.00	0.03	0.14	.891	.01	-.0.06	0.02	-2.91	.004	-.26
Education	0.05	0.10	0.46	.646	.04	0.01	0.08	0.13	.895	.01
Phone use frequency	-0.10	0.06	-1.55	.124	-.13	-0.01	0.05	-0.22	.825	-.02
Number of stressful situations	-0.02	0.01	-1.41	.161	-.12	-0.01	0.01	-0.89	.373	-.07
Guilt about phone use	0.09	0.09	-2.27	.025	-.19	-0.01	0.07	-0.08	.935	-.01
Phone use for coping	-0.21	0.23	0.40	.688	.03	0.14	0.17	.81	.417	.07
Negative influence on the parent-child interaction	-	-	-	-	-	-0.02	0.04	-0.39	.700	-.03
R^2 (multiple/adjusted)	.11/.07					.13/.09				

Note. 151 individuals. Model formula: outcome ~ 1 + age.mother + age.youngest.child (or age.reported.child) + spu.general + educ.mother + guilt.agg + phone.use.frequ + number of stressful situations + guilt.agg + phone.use.frequ. For parent-child relationship quality additionally + perc.in.p-c-i.agg. [1]For role satisfaction; [2]For parent-child relationship quality.

Explaining Satisfaction With the Mother Role

Next, we compared the effects of situational guilt and smartphone use on satisfaction with the mother role on the individual level. Table 4 shows the results of the final model. For satisfaction with the mother role, we found a significant negative effect of aggregated guilt ($F = 5.13$, $p = .025$, see Table 4), supporting H3. Mothers who reported more guilt around phone use reported less role satisfaction with their mother role. Answering RQ3, aggregated phone use for coping was not a significant predictor of role satisfaction ($F = 0.73$, $p = .788$).

Explaining the Perceived Phone Influence on Situational Mother-Child Interactions

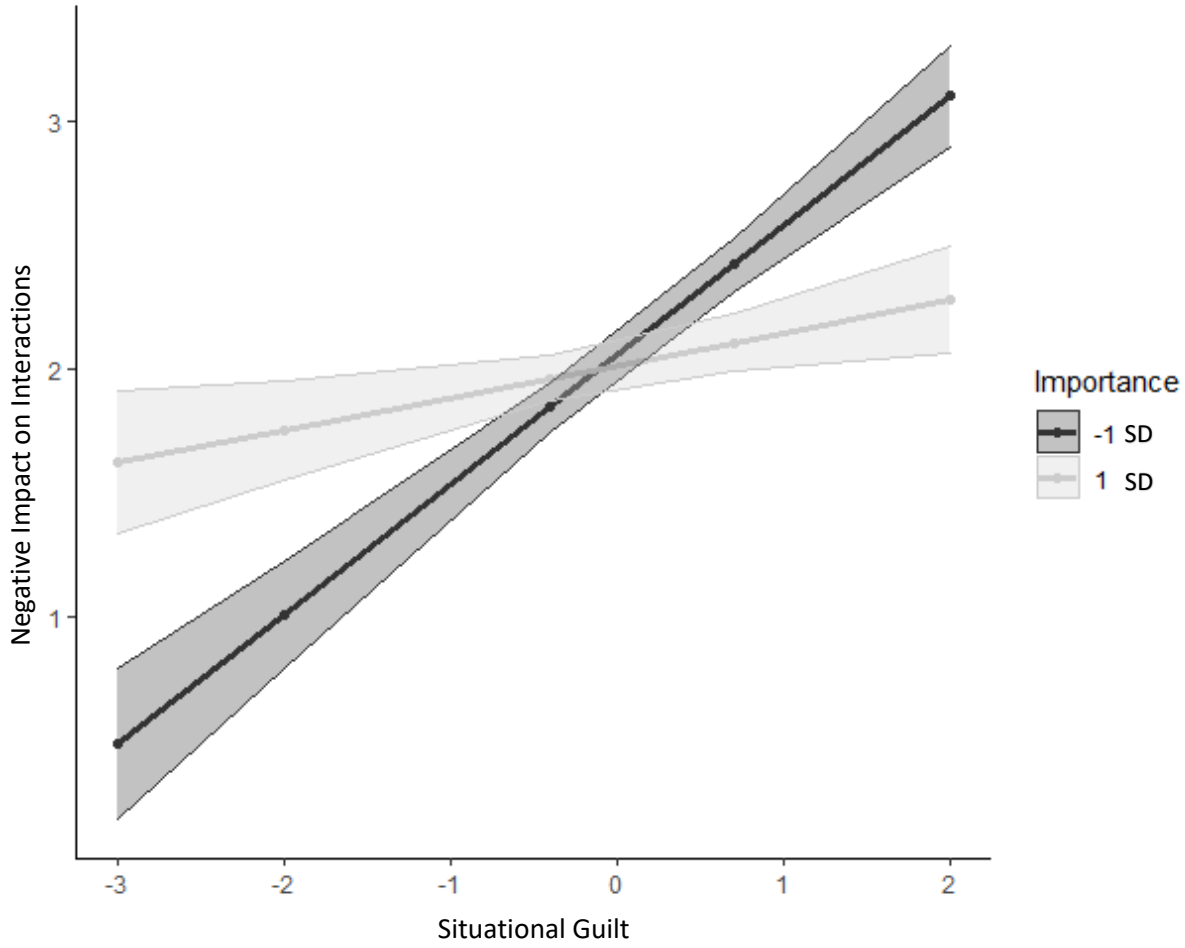
In the next step, we looked at relational consequences of guilt and smartphone use. On the situational level, we predicted that higher guilt about phone use is related to a higher perception of negative influences on the mother-child interactions (H4). We found support for H4 ($\chi^2 = 26.82$, $p < .001$, see Table 3). In an explanatory step, we also looked at the interactions with situational characteristics. Similar to the interaction observed for the effect of injunctive norms on guilt, situational importance moderated the relationship between guilt about phone use and the perception of negative influences on mother-child interactions ($\chi^2 = 13.56$, $p < .001$), such that the relationship was weaker in important situations (see Figure 2).

Explaining Mother-Child Relationship Quality

For parent-child relationship quality, none of the effects were significant (see Table 4). Contrary to H5, aggregated guilt about phone use was not significantly related to relationship quality ($F = 0.07$, $p = .793$). Contrary to H6, the frequency of using the phone for coping was not related to relationship quality ($F = 0.60$, $p = .440$). Moreover, and contrary to H7, the situational perception that the phone interfered with the mother-child interaction did not relate to parent-child relationship quality ($F = 0.15$, $p = .699$).

Figure 2

Interaction Between Situational Guilt and Situational Importance in Predicting Perceived Negative Impact of Phone Use on the Mother-Child Interaction



Note. *N* = 483 observations of 158 individuals. Regression lines shown for one standard deviation (SD) below and one standard deviation above the mean. Individual-level predictors are grand mean-centered, situation-level predictors are group mean-centered.

Discussion

The main objective of the present paper was to test if negative norms around parental phone use and associated feelings of guilt influence coping effectiveness when mothers use their phone for coping with stress. By employing mobile experience sampling among a sample of German mothers, we found that the more mothers perceived significant others disapproved phone use while parenting, the more they felt guilty about using their phones. Increased guilt around phone use, in turn, was related to a lower perceived coping efficacy. Moreover, our data revealed that, on the individual level, more situational guilt around phone use related to lower maternal satisfaction with the mother role. None of the situational measures of phone use (i.e., phone use vs. non-use, guilt around phone use, perceived phone interference into the parent-child interactions) did predict parent-child relationship quality. These results suggest that negative norms around phone use could have negative consequences for families. In the following, we will discuss the effects in more depth.

The higher impact of injunctive norms compared to descriptive norms is in line with previous work, which, for example, showed that people anticipated feeling more guilt in response to higher injunctive norms compared to higher descriptive norms (Jacobson et al., 2021). However, research on phubbing (i.e., phone use while interacting with somebody in person) found that descriptive norms showed a stronger influence on phubbing behavior compared to injunctive norms (Leuppert & Geber, 2020). Bringing these different findings together, injunctive norms might be related to *feelings* associated with a behavior, while descriptive norms might be stronger related to the *behavior* itself. A constellation of descriptive norms in favor of (parental) phone use but injunctive norms against (parental) phone use, thus, could lead parents and other interaction partners to use their phone often but also to constantly feel guilty about it. Given that a potential protective effect of norms against adverse phone use effects consequently does not occur and feelings of guilt could diminish positive effects of phone use, this state would be overall undesirable. However, given that the correlation between maternal phone use

and descriptive norms in our study was rather low (see Table 1), future research that particularly tests this explanation is necessary.

Guilt surrounding phone use was, as predicted, related to a lower perceived coping efficacy demonstrating that guilt around phone use can be related to negative consequences for the parent. It is still unclear if this effect results from a mitigation of positive phone use effects, as shown for media recovery effects by Reinecke et al. (2014). It is also possible that increased guilt is related to reduced coping effectiveness regardless of the effectiveness of phones as a coping tool. While the former would correspond to a moderation effect, the latter would be demonstrated by a main effect of guilt on coping effectiveness. Differentiating these kinds of effects is difficult because guilt for using phones requires phone use, making both variables inherently dependent. However, from a practical standpoint, as soon as guilt is associated with more negative outcomes, the question of moderation or main effects becomes perhaps secondary.

Our finding that guilt aggregated on the individual level related negatively to overall satisfaction with the mother role shows that more frequent guilt around phone use might have negative consequences beyond situational circumstances. We did not find an effect of aggregated guilt on parent-child relationship quality. A perceived negative influence on the parent-child interaction as a measure of technoference did not relate to role satisfaction or parent-child relationship quality, but related to situational feelings of guilt. These findings suggest that it is important to consider parental feelings of guilt also in studies focusing on child outcomes of parental phone use, as these feelings could offer another explanation of the found correlations between technoference and adverse outcomes (e.g., McDaniel & Radesky, 2018). If guilt and not phone use itself was responsible for at least some of the findings showing endured negative consequences of parental phone use, this would have important implications for interventions and public campaigns. It has to be noted that, on the situational level, we did not differentiate

between interactions of a mother with her different children. At the same time, we asked mothers to only report on one of their children for the parent-child relationship quality measure. Thus, null effects for parent-child relationship quality could also be caused by the fact that mothers reported negative phone influences on the situational interactions also based on their other children.

Overall, our findings imply that campaigns and a one-sided public discussion against parental phone use not acknowledging the potential benefits of phone use could introduce stress into families. Suggestions for campaigns that do not have a guilt-inducing effect could come from other areas of self-control research, where a similar dynamic can be observed. There are strong societal norms about the importance of striving towards long-term goals, such as a healthy lifestyle or career success. Doing something that promises pleasure in the moment (e.g., eating a tasty chocolate cake) but conflicts with those long-term goals triggers feelings of guilt and is experienced as self-control failure (Becker et al., 2019). Interestingly, it has also been shown that being able to enjoy rather than feel guilty about those "guilty pleasures" is a strong predictor of wellbeing and life satisfaction (Bernecker & Becker, 2021). Based on these broader findings, it seems appropriate that campaigns and media reports inform about parental phone use in a more differentiated manner, which includes an acknowledgment of positive as well as negative effects on parental and child wellbeing.

On a theoretical level, our findings support the value of the social constructivist viewpoint on media effects. This viewpoint emphasizes that not only media use itself can have effects, but that also an individual's socially constructed perceptions and feelings around the use can evoke effects. The associations of guilt with perceived coping efficacy and role satisfaction support that the social constructivist viewpoint adds important layers to studies looking mainly at the effect of digital media use itself. Our study, moreover, contributed that social norms influence feelings around media use, such as guilt. This finding confirms that the social context

in which individuals use media also impacts how individuals judge their media use and, in turn, how their media use influences their wellbeing.

Our findings also show how complex the effects of phone use on the everyday life can be. An individual's phone use in a specific situation includes potentially objectively measured variables (such as time spent with the device), but also motivation for use, used content, or feelings about the phone use. These different concepts need to be disentangled and tested for their unique influences. Such a differentiated view allows evaluating whether users have to reduce their media use or whether individual or societal perceptions and norms around digital media have to be rethought.

There are some open questions and limitations to our study. We did not find a significant relation between guilt and stress change. This result might imply that guilt is more strongly related to cognitive outcomes such as perceived coping efficacy while emotional outcomes are impacted less. However, as, on the situational level, experience sampling studies are most of the time cross-sectional (Masur, 2018), assessing stress before and after a situation is more difficult such that this measure might include more error than the perceived coping efficacy item. However, this cannot be judged conclusively based on the present study.

Another important question that remains open is the question of causality. It would also be possible that individuals feel more guilt around phone use if phone use did not enhance but even decrease coping efficacy, which would imply a reversed direction of influence. Similar to the study by Reinecke et al. (2014), we guided the participants through the situation. However, to properly test the question of causality, experimental research is necessary.

Another limitation of our study is the convenience sample, which led to an underrepresentation of less-educated mothers. Maternal guilt was discussed as an experience mostly associated with the life of modern middle-class women (Sutherland, 2010). Thus, norms and feelings of guilt around phone use might be experienced more in certain groups of society. By using different ways of recruiting (online and offline), we tried to diversify our sample. Still, future

studies are needed that use nationally representative samples or focus primarily on less-educated mothers.

Additionally, for the individual-level analyses, the small sample size is a limitation. As we only included mothers who used their phones for coping at least once, in many analyses, only a sample of around 150 individuals remained. For an experience sampling study, our sample size was comparably large. However, the associations on the individual levels should be interpreted with caution and need to be replicated using larger samples.

Conclusion

The present paper shows that the effects of phone use on parents' everyday lives are complex and that the positive and negative effects of phone use can be intertwined. Experience sampling is a meaningful approach to study these effects very closely to the situations in which they occur. Supporting the value of a social constructivist viewpoint on media effects, our results show that for future studies on digital media effects, it is important to consider socially constructed perceptions and feelings around media use in combination with measures of digital media use to build a more holistic view on digital media effects in everyday life. Such a holistic view allows us to judge which behaviors or feelings should be at the core of our theoretical models and which behaviors and feelings prevention efforts need to target: changing parents' phone use, changing parental perceptions on their phone use, or changing societal norms around parental phone use. Our study can serve as a starting point to assess and include these different constructs in future research.

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General Discussion

In my dissertation, I aimed at answering the research question, how mothers use smartphones to manage stress and under what circumstances their stress management with smartphones is successful. By employing a scoping review, a focus groups study, and an experience sampling study, I contributed to answering this research question in important ways. First, I developed a theoretical underpinning for where to place media use in the coping process by differentiating between coping strategies and coping tools. Second, I showed that mothers use their smartphones to cope with stress mainly to distract themselves from the stressful encounter and to seek information and social support. Mothers used their smartphones mainly for positive and non-stressor-related content but also turned to stressor-related content in important situations. Third, I showed that individual characteristics, and primarily how salient a smartphone is for the individual, determine whether mothers use their smartphones when confronted with a stressful situation. Fourth, I contributed essential insights about what factors influence whether parental coping using phones is effective. Smartphone use in stressful situations was associated with less stress decrease overall, but the use of positive content related to more coping effectiveness. Feeling guilty about using a phone was related to a decreased coping effectiveness.

In the following, I will outline these contributions and main findings in more detail and derive insights for the different literature fields outlined in the introduction to this thesis. I will then summarize the implications of my work for four different areas: for theory, for research design and methods, for parents, and for politicians and health practitioners. After outlining the implications of my dissertation, I will discuss the limitations and strengths of my dissertation before concluding my work with a short overall summary and outlook.

Contributions

The Theoretical Underpinning for Media Use in the Coping Process

My dissertation started with realizing that media use for coping purposes has been studied for a long time but was not assessed systematically. Therefore, there was no clear understanding of where media use plays a role in the coping process. Building on an extensive review of the previous theoretical conceptualizations of coping using media, I, together with my co-author, developed such a placement in the coping process. In our scoping review, we suggest extending the transactional model of stress and coping by differentiating between coping strategies or coping aims and coping tools such as media. This makes it possible to locate media use in the coping process and assess it adequately.

In the empirical studies of my dissertation, both the focus groups and the experience sampling study, I used this distinction. Both studies show how useful this distinction is. It emphasizes that media can be used for very different coping aims. Such different uses might have different effects and follow different mechanisms that would be masked if media use is seen as a coping strategy and compared to other strategies (e.g., active coping, social support).

How Do Mothers Use Smartphones in the Coping Process?

The first part of my research question asks how mothers use their phones for stress management. My dissertation shows that, as previous studies have suggested (McDaniel & Radesky, 2018; Radesky et al., 2016), parents seem to use their smartphones quite frequently to cope with stressful situations. In the focus groups study, participants described many situations involving phone use for coping. In the experience sampling study, mothers reported having used a phone in about one-third of stressful situations while being with their children. In both of my empirical studies, parents indicated having used phones for several coping strategies. Comparing the frequencies of reported coping strategies in both studies is interesting because noteworthy similarities and differences emerge.

Coping Strategies for which Mothers Use Their Smartphones. When mothers used their smartphone, self-distraction was an important and frequently mentioned strategy in both studies. However, comparing the relative importance of self-distraction in both studies shows that self-distraction was reported more in the experience sampling study than discussed in the focus group discussions. Taking a break as the second most mentioned strategy in the experience sampling study serves a related aim of distancing oneself from the current stressful encounter, at least for a short break. While distancing oneself from the stressful situation was also an essential aim for smartphone use in the qualitative study of Radesky et al. (2016), it has received less attention in previous studies on digital media use in the parenting context (Dworkin et al., 2013). Using a phone to take a break or distract oneself from the situation is, thus, a relevant phenomenon for future research. One phone use pattern prominently described in the focus groups study was that mothers used their phones for a short moment of alone-time and solitude while being with their children. This usage pattern, which I later called "solitude snacking" (Wolfers, 2019), is a particularly interesting topic for future research.

Other frequently reported strategies included information seeking, emotional and instrumental support, and active coping or planning. Information seeking was the most described strategy in the focus groups study, while mothers reported information seeking in only 13% of stressful situations in the experience sampling study. However, similar to the focus groups pattern, information seeking was again to a high extend reported in combination with phone use. This implies that if information is sought, a smartphone is almost always used. Emotional and instrumental support showed similar patterns in both studies, with smartphones being more critical for emotional than instrumental support. For active coping, phones were used in 16% of all situations involving phone use in the experience sampling study and frequently mentioned in the focus group study. However, in both studies, active coping and planning were more likely to be accomplished without smartphones.

Differences and Similarities between the focus groups and the experience sampling studies. Thus, the overall choice of coping strategies and the relative importance of coping strategies for phone-based coping and general or non-phone-based coping are comparable between both studies, which is interesting given that counting is often seen as problematic in qualitative research (Hannah & Lautsch, 2011). However, the larger frequency of self-distraction and the lower frequency of information seeking in the experience sampling study show the different mechanisms by which both methods work. Aggregation across situations and individuals in the experience sampling study is done by the researcher by summarizing all situations unweighted. In the focus groups study, individuals probably report encounters they remember better or which were particularly fitting to the discussion. This leads to a summarized score in which more important or prototypical situations might be overrepresented. Thus, the selection of situations on which participants report likely differs between both designs (see Conner & Barrett, 2012 for a related discussion about the "experiencing" and the "remembering" self).

The different weightings in the designs are both informative. In the focus groups study, the score might be weighted relative to the importance of a stressful encounter, while in the experience sampling study, the sole frequency of a coping behavior in stressful situations is determining the overall score. Taking both data sources together leads us to conclude that self-distraction is the most important coping strategy for which mothers use smartphones in frequent everyday situations. In more critical or particularly stressful and, consequently, more memorable situations, information seeking and social support might play a more significant role.

Smartphone Content Used in Stressful Situations. Concerning smartphone content that mothers use for coping, the focus groups study showed that search engines and parenting websites are used for information seeking. For social support, calls and instant messengers

were important. For self-distraction, a wide range of hedonic media use was described (games, social media, entertainment). Parents used a similarly broad range of functional apps and content as calenders or how-to-videos for active coping. In the experience sampling study, we asked participants to report if the content they used was positive or negative and stressor-related or stressor-unrelated on a semantic differential to measure the mood management factors of hedonic valence and semantic affinity. Matching the prominence of self-distraction as a coping aim, mothers reported using mostly positive content unrelated to the stressor. However, when mothers rated the stress-evoking problem as more important, mothers used more stressor-related content. The difference in usage depending on the situational importance supports Humphreys et al.'s (2018) assumption that smartphone usage patterns and gratifications sought are highly dependent on situational conditions.

In the literature review, we called for the development of measures that are possible to use in different contexts and across different media platforms to identify overarching mechanisms concerning media use for coping. Measuring overall perceptions of phone use content characteristics as done in the experience sampling study is one possibility to achieve such a context- and media-independent measure. Both measures (hedonic valence, semantic affinity) were associated with several situational factors as we expected, suggesting that asking about such overall perceptions might be a fruitful way of dealing with the problem that smartphones as metamedia include many different and individualized constituent media.

To summarize, important coping strategies for mothers using their devices were self-distraction, information seeking, social support, and active coping. Self-distraction was the most commonly used strategy but might be less critical in important or memorable situations. Smartphone content that mothers used was mainly positive and not stressor-related and might thus mostly match emotion-focused coping aims. In important situations, mothers used more stressor-related content.

On a methodological level, my dissertation showed interesting similarities between the qualitative focus groups and the quantitative experience sampling design, suggesting that, overall, both methods provide comparable results. However, less critical or more ordinary situations might be reported less in focus groups and more in the experience sampling study. Moreover, overall preceptions of content as the positive valence or semantic affinity proved to be useful measurements to capture the overarching content characteristics of media applications.

What Determines if Mothers Use Their Smartphones for Coping With Stress?

Related to how mothers use their smartphones, my dissertation also contributes to the question under which circumstances mothers use their smartphones more. The experience sampling study showed that mothers who reported that their phone was cognitively highly salient used it more for coping. Thus, this finding confirms an assumption formulated in the scoping review: Namely, that the salience of a coping tool increases its use in stressful situations. Physical salience (higher physical accessibility of the phone) and phone personalization did not predict phone use for coping.

Situational characteristics had surprisingly little impact on whether mothers used their phones for coping in the experience sampling study. In the focus groups study, situational urgency and importance emerged as situational characteristics which might impact maternal phone use for coping. The results of the experience sampling study did not confirm these results. One possible reason for this difference could be that situational factors do not impact *whether* the phone is used but only *how* it is perceived and used. Humphreys et al. (2018) emphasize in their conceptualization of smartphones as metamedia that situational circumstances determine how an individual perceives their phone and whether a phone offers specific gratification opportunities. This, combined with my results, suggests that situational characteristics might not influence phone use versus non-use but that situational factors instead influence

which gratification opportunities an individual perceives and which gratification an individual seeks, resulting in a different usage of the device.

To summarize, mothers with a higher cognitive salience of phones used it more for coping. Situation-specific and device-specific (e.g., personalization) factors did not predict whether mothers used their phones for coping. Thus, person-specific characteristics or user patterns might be the most decisive for using a phone for coping in more situations. At the same time, situation-specific factors might determine instead *how* a phone is used.

Which Factors Determine if Phone Use for Coping is Effective?

In our scoping review, we proposed to use a situational approach to research media use for coping and study circumstances of effective smartphone use instead of researching the uniform effectiveness of smartphones across all circumstances. Accordingly, my focus groups and experience sampling studies focused on stressful situations and the person-specific, device-specific, and situation-specific boundary conditions of effective smartphone use for coping.

In the focus groups study, the factors of urgency, phone-use self-regulation, quality of information and relaxation, and self-assurance emerged as such boundary conditions important for coping effectiveness of phone use. We also tested the factors of urgency and phone use self-regulation in the experience sampling study. Surprisingly, we did not confirm the importance of urgency and phone-use self-regulation for the coping effectiveness of phone use in the experience sampling study. Neither of the two factors moderated the relationship between phone use/non-use for coping and coping effectiveness. Also, neither of the other situation- (e.g., control) and device-specific (personalization) factors assessed in chapter three of my dissertation were found to moderate the association of phone use vs. non-use and coping effectiveness. On the contrary, we found a main effect of phone use for coping on stress decrease: In situations where mothers used their smartphones, stress intensity decreased less from during the situation to the end of the situation compared to situations where mothers did

not use their phones. This might speak against our argument to investigate boundary conditions instead of assessing uniform efficacy. However, I do not think we should dismiss the approach to study the boundary conditions instead of the uniform effectiveness of phone use for coping.

The Problem of Complexity. There are several possibilities to explain why we did not find moderation effects. First, it is possible that given our sample sizes on the individual and the situational level, our models were too complex. We might simply not have had enough power to detect smaller moderation effects, especially for cross-level interactions (for a simulation of power in two-level multilevel models, see, e.g., Arend & Schäfer, 2019). Second, it is also possible that our models were not complex enough. We modeled linear two-way interactions between phone use and factors that we assumed would impact the relationships between phone use and coping effectiveness. It is possible that using non-linear or three-way interactions or adding more factors would have been more appropriate.

Complexity is inherent in models such as Vanden Abeele's (2020) digital wellbeing framework, which conceptualizes digital wellbeing as the result of a dynamic network. We have shown in our review that previous research from different perspectives suggests that there is likely not an easy (i.e., linear, one-way, direct) answer to the question of whether media are effective in reducing stress. Similar evaluations have been made in other fields on (digital) media use and wellbeing (e.g., Meier & Reinecke, 2020; Orben, 2020). With the advent of smartphones which are "carried into an unprecedented range of situations" (Humphreys et al., 2018, p. 2795), the complexity in the relationships of digital media use and wellbeing have likely increased. So, unlike stationary media such as television, situational factors have multiplied, making relationships potentially even more complex.

Having established that there is no simple answer to the questions about the usefulness of smartphones so that they enhance and do not damage our wellbeing (our review, Meier & Reinecke, 2020; Vanden Abeele, 2020), but that the relationships are complex, we need to

find better answers in the next few years about how to map this complexity. In addition to statistical innovations (see, e.g., Valkenburg et al., 2021), it is also important to achieve the statistical power to model such complex relationships. My experience sampling study was possibly unable to map the complexity here because power was too small. Compared to other experience sampling studies, this was a rather large study involving more than 200 mothers (Schnauber-Stockmann & Karnowski, 2020). On the situational level, many situational questionnaires had to be excluded because mothers did not experience a stressful situation in the last two hours or have not been with their children. Thus, on the situational level, the sample size was small to medium (Schnauber-Stockmann & Karnowski, 2020). With the need to model complex relationships, the need for larger sample sizes on both levels increases. Thus, further research is needed to better judge which impact the circumstances have on phone use's effectiveness for coping in the parenting context and beyond.

Positive Content Relates to Increased Coping Effectiveness. Besides testing the moderations, we found two other factors that impacted coping effectiveness: Using positive content and experiencing less guilt while using the phone. Positive content showed a direct impact on perceived coping efficacy but not on stress change. Although we did not predict this in a hypothesis, this relationship makes sense, given that positive emotions were shown to be important in the coping process (Folkman & Moskowitz, 2004; Tugade & Fredrickson, 2007). More importantly, positive media content evoking hope, amusement, and calmness was shown to reduce stress experiences (Prestin & Nabi, 2020). This finding is in line with the predictions of mood management theory predicting that media content with a positive hedonic valence is successful in calming negative, high-arousal states as stress (Zillmann, 1988). This result thus joins earlier findings showing that positive emotions are important parts of effective coping and that media are very well suited to evoke and reinforce these positive emotions. My study adds that smartphones can be a source for such short-term positive emotions in everyday life stressful situations.

Thus, for mothers who face a stressful situation, getting a small boost of positive emotions through their smartphones seems an effective use of smartphones in stressful situations. Studies show that a mother's positive emotions can moderate the effect of parenting stress on maternal sensitivity (Martin et al., 2002; Smith & Stephens, 2018). This suggests that positive emotions might be a protective factor preventing from adverse effects of parental stress on parenting behaviors and consequently from negative effects of parenting stress on children. If such a protective factor could be strengthened by a simple behavior such as using a smartphone for a short period, as our results suggest, using positive phone content or even "prescribing" positive phone content as done by Prestin and Nabi (2020) might be a promising approach for mothers.

On a theoretical level, linking back to the levels of factors that might influence the coping effectiveness of phones (Humphreys et al., 2018; Vanden Abeele, 2020), our result about the influence of using positive content implies that momentary device-specific factors, so *what kind of content* an individual uses, might be the most decisive for effective coping.

Guilt Relates to Decreased Coping Effectiveness. As a second significant predictor, we found that parents who reported feeling guilty about using their smartphones also reported reduced coping efficacy. This finding supports the value of the social constructivist viewpoint of media effects which I developed as part of my dissertation. The relationship of situational guilt and perceived coping efficacy implies that the perception of smartphone use while parenting as inappropriate and thus guilt-inducing behavior can impact the effects of smartphone use. Situational guilt was moreover predicted by a mother's perceived injunctive norms against phone use while parenting. Therefore, mothers who perceived that important others in their lives judge phone use while parenting as inappropriate experienced more guilt. This supports the notion that perceptions about media use are socially constructed. Already the focus groups study showed that parents judge other parents' phone use while parenting negatively and get negative feedback from their surroundings when they themselves use their phone

while parenting confirming the existence of strong, negative social norms against parental smartphone use while parenting.

In my view, my findings show that a social constructivist viewpoint can shed a new and important light on the discussion on parental phone use. It shows that negative media coverage and campaigns that paint a negative picture of parental phone use could induce maternal guilt and stress into families instead or on top of protecting families from negative influences of the phone on, for example, parent-child interactions. The experience sampling study showed that mothers who reported more guilt around smartphone use also reported decreased role satisfaction. This finding aligns with other studies showing that maternal feelings of guilt can lead to negative consequences such as lower self-efficacy and higher levels of stress and anxiety (Henderson et al., 2016; Prikhidko & Swank, 2018).

The social constructivist viewpoint in broader debates. In a broader sense, I believe that the social constructivist viewpoint can also be of value for the broader field of media use in the family, including the literature on the effects of children's screen time (see also Wolfers et al., 2021) and also on digital media use effects overall. Studies have consistently shown that objective digital media use and self-reported digital media use differ and it was consequently proposed that "objective media use" and "perceived media use" measure different constructs (Parry et al., 2021; Scharkow, 2016). It was moreover shown that these constructs are differently related to media effects: Studies have, for example, revealed that self-reports of digital media use show stronger relations to reduced mental health than tracked media use (Sewall et al., 2020; Sewall & Parry, 2021). Thus, also for digital media use in less morally charged contexts as the family context, it seems likely that not only the objective features of media use but perceptions of media use produce relevant media effects.

There are only a few studies about the social construction of such media use perceptions. The early studies of Campbell (2007; Campbell & Russo, 2003) show consistently with the relations of norms and guilt found in the experience sampling study of my dissertation that

perceptions of media use (e.g., appropriateness to use a phone in a restaurant) is socially constructed. Similarly, the research created insights about the appropriateness of phone use and the influence of norms in this context (Leuppert & Geber, 2020; Schneider & Hitzfeld, 2019). The social constructivist viewpoint offers a theoretical base to distinguish between objective and perceived media use and explains how differences between both constructs might be attributable to a social construction of media use perceptions. By emphasizing this distinction, a social constructivist viewpoint also provides an essential way of thinking when we discuss the potentially harmful effects of digital media use. If only perception and not actual media use is associated with a certain harmful media effect, then interventions should not attempt to change the media use itself but address the individual's perception of their use or the social norms about media use. This distinction is, consequently, not only of high theoretical but also of high practical relevance. Therefore, I see the social constructivist view on media use as I developed it during my dissertation as one of my work's important contributions, opening many avenues for further research and theorizing.

I want to summarize in the following the key implications of my dissertation for three groups: For researchers, for mothers, and for professionals who develop campaigns or advise mothers (e.g., midwives). For researchers, I will distinguish between implications for theory and implications for methodology and research designs.

Implications

For Theory and Future Research

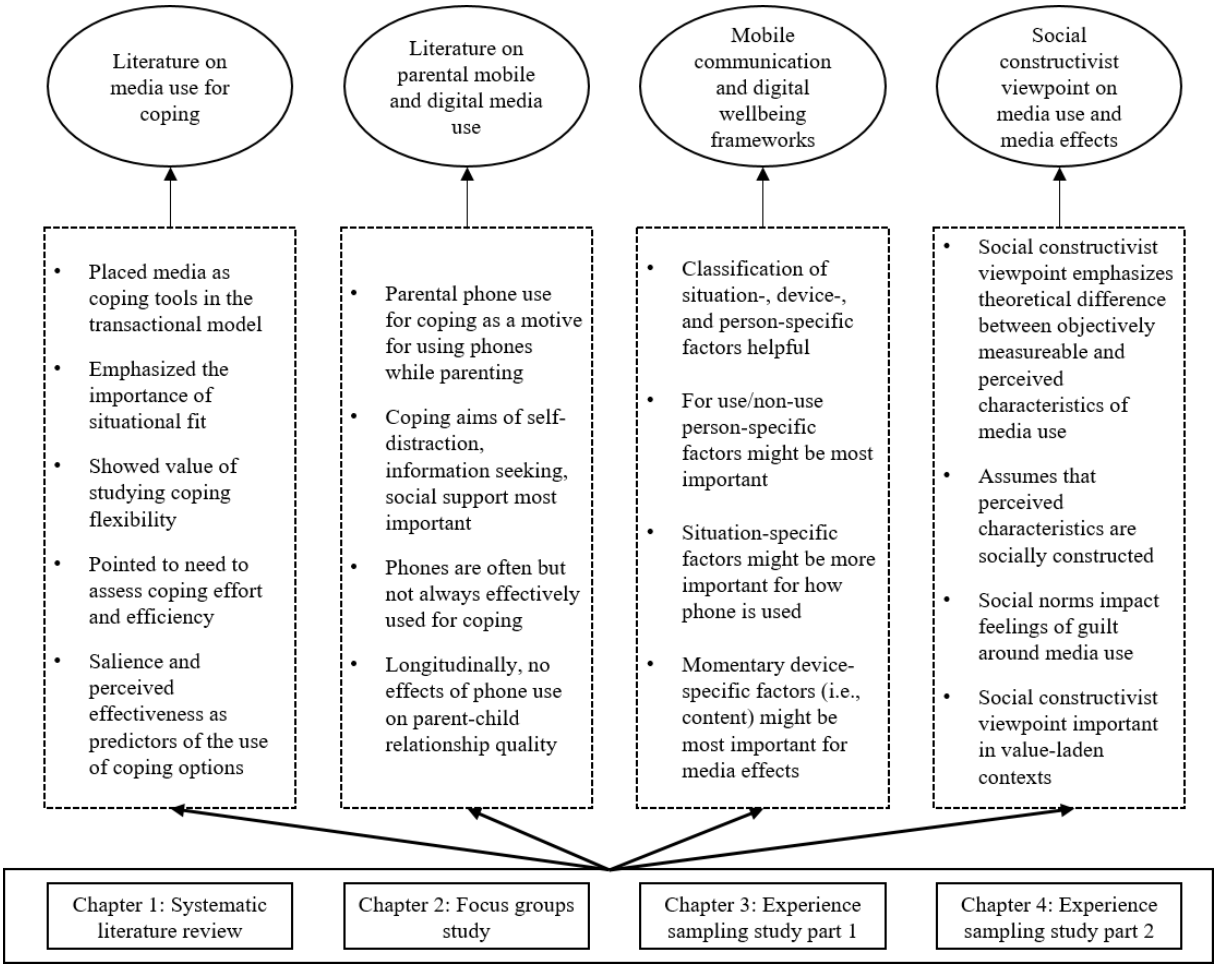
In my dissertation, I built on several different literature fields and different theoretical approaches for which my work revealed important aspects and avenues for future research. Figure 1 illustrates my contributions to each of the literature fields.

For the Literature on Media Use for Coping. The scoping review offers a way to place media as coping tools in the transactional model. This represents a theoretical contribution to stress management research and research on coping with stress as a motive for media

use. Also, other recent theoretical innovations have proposed that coping should be differentiated into two or more dimensions (Stanisławski, 2019, for example, distinguishes between coping strategies and coping modes). Our conceptualization provides a tailored way of studying media for coping. Still, it can also be transferred to studying other coping behaviors, which can serve more than one coping aim (e.g., talking to a friend), making it suitable to compare media use to different coping behaviors.

Figure 1

Contributions of my Dissertation to the Four Literature Fields



Our review also offers several other contributions that can help integrate the diverse field of media use for coping, including emphasizing the importance of studying situational

fit, the role of coping flexibility and effort, and the constructs of salience and perceived effectiveness. In the experience sampling study, cognitive salience of the phone also proved to be important for more frequent use of phones for coping and, thus, might be a particularly fruitful concept for future research.

For the Literature on Parental and Digital Media Use. For research on parental phone use, I addressed three main gaps identified by recent literature reviews: Four literature reviews called for research on why parents use their phones, on potentially positive effects of parental smartphone use, and for more longitudinal research (Braune-Krickau et al., 2021; Hood et al., 2021; Knitter & Zemp, 2020; McDaniel, 2019). My dissertation showed that mothers of young children use their smartphones to cope with stressful situations by distracting themselves and seeking information and social support. While the previous literature on parental digital media use has provided insights for the latter two aims, the aim of self-distraction was not as prominently discussed. Future research should look more closely into this usage motive, for example, by researching how mothers can integrate such short escapes from their daily hassles into their everyday lives without being a concern for parent-child interactions. In terms of potentially positive effects, my studies imply that guilt around smartphone use might interfere with potentially positive outcomes of smartphone use. However, while the focus groups study offered many descriptions of successful phone use for coping, I found a direct negative association of phone use with stress decrease in the experience sampling study. Longitudinally, we found no relationship of frequency of phone use for coping with maternal role satisfaction or parent-child relationship quality. We do not support previous studies which showed negative consequences of parental phone use for parent-child interactions (for an overview, see McDaniel, 2019).

In summary, my dissertation's findings suggest that phone use for coping cannot be seen as a generally "positive" use. My results, however, show that phones *can* be used successfully in stressful situations while children are present, but that successful use depends on the

circumstances. By using a stress and coping framework, I show how research on parental phone use can use frameworks and findings from different fields of literature to contribute to a more differentiated picture of parental phone use, including both benefits and detrimental effects. Moreover, my dissertation contributes longitudinal findings and the first experience sampling study conducted in this field.

For Research on Mobile Communication and Digital Wellbeing. For research on mobile communication and digital wellbeing, my studies show that the classifications into stable and momentary situation-specific, device-specific, and person-specific factors of Vanden Abeele (2020) and Humphreys et al. (2018) help structure the complex set of factors that influence both smartphone use and smartphone use effects. In terms of the relative importance of the different levels for smartphone use for coping, the experience sampling study suggests that person-level factors (in particular cognitive salience) impact *if* a smartphone is used. Situation-specific factors seem to be important for *how* a smartphone is used (e.g., which content is used). For smartphone use effects, my experience sampling study suggests that momentary device-specific factors, particularly the valence of used content, are most influential. As indicated in our review, the media characteristics proposed in Zillmann's (1988) mood management theory proved helpful for characterizing momentary characteristics of smartphone use content. To summarize, for research on mobile communication and digital wellbeing, my studies showed the fruitfulness of classifying factors into the three different levels and stable and momentary factors and showed which levels might be significant to look at in future research.

The Social Constructivist viewpoint on media use and media effects. Lastly, my dissertation contributes a social constructivist viewpoint on media use and effects. In a nutshell, this approach emphasizes that media use not only impacts the user because of the (objective) act of using a particular media content for a certain amount of time but also because the

user evaluates and perceives their own use in a particular way. These perceptions about a user's own media use depend on what the world around a user says about this media use and are thus socially constructed.

In my dissertation, building on this viewpoint, I not only assessed which effects a mother's phone use has on her feelings of stress but also which effects her feelings of guilt around this use have. My experience sampling study shows that feelings of guilt around phone use are influenced by injunctive norms about parental phone use, that is, if others evaluate phone use while parenting as inappropriate. Increased feelings of guilt in turn related to a mother's evaluation that her coping was less effective and, on the individual level, related to lower satisfaction with the mother role. These findings show that it is important to consider perceptions and feelings around media use in the parenting context and implies that perceptions and feelings might also be important when investigating the implications of digital media use on the media users for other target groups.

The social constructivist viewpoint emphasizes that objective media use characteristics differ from perceived media use attributes on a theoretical level (see also Parry et al., 2021; Scharkow, 2016). While many have emphasized that we need more objective digital media use measures (Appel et al., 2020; Kaye et al., 2020; Orben, 2020), such a distinction on a *theoretical* level is still not often done in media effects research (see Meier & Reinecke, 2020 for related discussion). My dissertation's findings show that in moral-laden contexts in which strong injunctive norms about media use exist (as the parenting context), distinguishing between objectively measurable characteristics of the media use (e.g., use vs. non-use, usage time) and perceived attributes of media use (e.g., perceived appropriateness) is of particular importance also for future research.

For Methodology and Research Design

On the methodological level, my combination of methods shows how insightful combinations of qualitative and quantitative methods can be for research on media use in everyday life (see also Thorhauge & Lomborg, 2016). Several findings of the experience sampling study were supported and contextualized by the participants' descriptions in the focus groups study. Differences, for example, about the used strategies, provided valuable insights into situational and overall perceptions of maternal smartphone use and their effects.

My research findings and the methodological challenges I faced show the complexity of factors that impact situational and aggregated influences of different kinds of smartphone use on individual wellbeing and relationships. This complexity is inherent in many recent conceptualizations of digital and mobile media use and wellbeing (Humphreys et al., 2018; Meier & Reinecke, 2020; Vanden Abeele, 2020). However, our effort to measure and model these complexities are only in its early stages. My experience sampling study in which I measured many factors on different levels shows these difficulties, especially regarding the statistical power to find small effects reliably. From my experiences, I would derive several points for future research.

First, tracking media use can have an additional benefit beyond the ability to accurately measure objective use: Tracking also does not afford that individuals spend a lot of time answering questionnaires. The option of tracking thus can also be an option to reduce participant burden. Still, questionnaires remain necessary to measure perceptions of use. Second, potential complexities, primarily if they have not been studied before (e.g., non-linear relationships), make it challenging to preregister predictions. At the same time, more complex relationships usually need larger sample sizes to manifest. Thus, combinations of larger, exploratory studies for which the whole range of complex relationships are looked at in combination with smaller and more focused studies to replicate the found relationships in reregistered studies might be a suitable approach, in particular for dissertations and larger projects. Third,

qualitative studies on the situational level might be interesting approaches to select from the large number of potential factors (e.g., where, with whom, in which mood, at what time of the day, after what kind of event), influencing smartphone uses and effects. Qualitative studies using experience sampling, such as the mobile instant messaging interview, can be valuable designs that allow participants to contextualize why they used their smartphone in a particular moment in a specific way (Kaufmann & Peil, 2020).

Besides, my experience sampling study shows that a suitable method for investigating media characteristics across different platforms and constituent media is measuring overall perceptions of content. We measured the mood management characteristics of hedonic valence (positive vs. negative content) and semantic affinity (stressor-related vs. stressor-unrelated; Zillmann, 1988), which proved important in the stress and coping context. Thus, measuring such overall characteristics might be a way of measuring the effects of different kinds of contents (see Kaye et al., 2020 for a related discussion).

Lastly, the question of measuring objective or objectively measurable and perceived media use is, of course, also relevant for study design and measurement. However, as already discussed, I argue that it would be most helpful to move this discussion from a methods-based discussion to a theoretical one. In a first step, researchers should decide which kind of media use is theoretically of interest before a debate about the reliability of a measure (does it measure what it is supposed to measure?) can take place.

For Mothers

Overall, my dissertation shows that there is no need to panic about own smartphone use when children are around. In my experience sampling study, none of the phone use variables related significantly to parent-child relationship quality. However, the growing body of research suggesting that phones can interfere in parent-child interactions should also be taken into account (for an overview, see McDaniel, 2019). Thus, building on previous research and my dissertation, I would draw three conclusions for mothers of young children.

First, it is essential to be mindful about own smartphone use and consider that there might be negative and positive consequences. Consequently, an adaption of own phone uses might be suitable for some areas (e.g., when phone use introduces instead of reduces stress).

Second, as the impact of factors that influence if phone uses' costs outweigh benefits seems to be rather complex, the individual who can judge the best under which circumstances there is a clear tendency in one direction is probably the parent themselves. Thus, after reflecting and being mindful about one's smartphone use, the next step is to be confident in one's judgment and (to try) not to feel guilty when one uses a phone. My results show that feeling guilty might reduce the benefits of phone use.

Third, parents could start to think about how they can obtain positive content when using their phones. Using positive content on a smartphone might be an easy way of increasing positive emotions when faced with stressful daily hassles, which in turn could prevent from being insensitive towards the child. Thus, if a phone is used, for example, to quickly escape an unpleasant situation for a short period, parents should try to look for positive content during this time.

For Professionals in the Parenting Domain

For professionals who advise parents about good smartphone use practices or developers of health campaigns, my findings overall suggest that it is important to consider the benefits of parental phone use. Moreover, the aim and the outcomes of a campaign or personal advice should be carefully considered. Asking parents on posters if "they already talked to their child today?" (Die Drogenbeauftragte der Bundesregierung, 2017) might, as a first result, induce guilt or could contribute to more intense social norms, which in turn might lead to more parental guilt. In our study, we showed that guilt was related to less satisfaction with the mother role. Therefore, while feelings of guilt might protect from using the phone more, these feelings could also have negative consequences for maternal wellbeing. Evoking guilt should therefore – if at all – only be done carefully.

Limitations and Strengths

Beyond its contributions, my dissertation, both in theory and research, also has limitations. In general, while for some points, my research aim was broad, for other points, it was narrow. These points are important to consider when interpreting my findings. I will outline these points and what they mean for the interpretation of my findings in the following. Then, I will also discuss additional limitations of my dissertation and specific studies. In the end, I will contrast the limitations with the strengths of my dissertation

Limitations

Being Broad Instead of Specific. Although this is recommended in research on stress and coping (Duvenage et al., 2019; Lazarus, 1999), I did not look into differences between stressors or between different types of stressful transactions (challenge, harm, loss). I here chose a broad and not a differentiated approach. Duvenage et al. (2019) emphasize that "anchoring the coping process to one type of stressor allows for a more tailored (and arguably more accurate) measurement of appraisals and coping responses" (p. 585). Thus, my findings might mask differences between different kinds of stressors, for example, between parenting stress directly tied to the parenting role and other stressors such as work or financial insecurities. Future studies should therefore explore such differences.

Also, for smartphone use, my approach, especially in the experience sampling study, was broad. In our scoping review, we discuss that it is possible to distinguish coping tools on different levels (e.g., using a phone vs. watching TV or one Facebook post vs. another Facebook post). In the experience sampling study, I mainly compared phone use with no-phone use (i.e., all other coping tools). I did investigate differences for different content characteristics (i.e., positive valence and semantic affinity), but I did not differentiate between constituent media such as social media, calls, and news websites. The large body of literature in communication science which studies the uses of one social media site compared to another (e.g., Tandoc et al., 2019; Vermeulen et al., 2018) already shows that such an approach can

similarly mask significant differences between different usage patterns. Again such differences for coping with stress using certain constituent media should be studied by future research. However, as I argued in my contributions section, assessing overall perceptions of content might also be a fruitful way to assess effects across different constituent media. To back up this argumentation, studies investigating if accessing different kinds of positive content (e.g., a Facebook article or a positive news story) differs in increasing coping effectiveness might be of particular value going forward.

Being Specific Instead of Broad. In two aspects, I chose to be specific instead of broad. Most prominently, my target group with mothers of young children is relatively small. This, of course, limits the generalizability of my findings beyond my research question. It remains, for example, unclear if guilt around phone use is also an important factor for fathers and if they similarly benefit from using positive content. Guilt has been particularly tied to the mother role (Sutherland, 2010) and studies show that mothers, for example, experience more work-family guilt compared to fathers (Borelli et al., 2017) or a similar level but partly different forms of guilt (Martínez et al., 2011) suggesting gender differences in parental guilt. Moreover, while I described how my findings also contribute to the broader discussion on digital media use and wellbeing, it is only speculative if, for non-parents, phone use for coping follows similar mechanisms. I expect that many processes might be similar between the parenting and other contexts but that certain processes (e.g., the role of norms) are more pronounced given that parental smartphone use was particularly critically discussed in the public. However, the differences between phone use for coping between parents and non-parents still need to be researched.

There are overall two reasons why I think choosing mothers of young children as target group was important: First, parenting stress and parental phone use might have particularly severe consequences because, as many studies suggest, both might have severe consequences for their children (for an overview for parenting stress, see Deater-Deckard, 2004, for

an overview for parental smartphone use, see McDaniel, 2019). Because mothers are still the primary caregivers (Craig & Mullan, 2011) and younger children are particularly dependent on their parents' behavior, studying mothers of young children's stress and phone use is an important research aim.

Second, parents of young children face time-space constraints (Barclay et al., 1997; Frantál & Klapka, 2020). Their coping options are limited to the need to keep caring for their children (e.g., they have less time for self-care activities, Nystrom & Ohrling, 2004; Widarsson et al., 2013). Thus, for my target group, the availability and multifunctionality of phones might be particularly valuable and helpful. Overall, I argue that while the smaller target group limits the generalizability of my findings, it also enhances the precisions of my results for a group for which stress and phone use are of particular importance.

Another restriction regarding the situations I made was that I only considered situations in which the children were present. As for the other point for which I chose to be specific compared to broad, this decision was made based on my main research interest. While my research is also based on a general discussion about mobile and digital media use and wellbeing (of which coping using media is a part), my main research interest was to research how mothers of young children use their smartphones to cope in stressful situations. Thus, my main and most accurate contributions can be made to precisely this topic.

Additional Limitations. Besides the breadth and specificity of my general research aims, I also made choices in one of the studies that can be seen as limitations. Most importantly, in the experience sampling study, I did not look into phone-strategy combinations as the central variables to assess coping effectiveness. So here, I do not follow the recommendation that we give in the scoping review. In a pretest of the experience sampling study, we saw that using phone-strategy combinations would have led to small sample sizes per combination, which would have reduced power considerably. Thus, we decided to focus on the

phone and its coping effectiveness overall. Again, this decision could mask important differences already proposed in the focus groups study (e.g., urgency seemed to be more critical for some coping strategies). Based on the focus groups study results and the literature review, I expect that this decision masks differences. I still think, however, that our findings add to the literature in important ways, for example, by showing the relative importance of the strategies for phone use and by emphasizing which level of factors might be most important for coping effectiveness. Building on our results, however, future studies should focus more specifically on phone-strategy combinations and the differences between phone use for specific coping strategies.

Especially for the experience sampling study, also the selected convenience sample is a limitation of my dissertation. One drawback of experience sampling studies is that they are effortful and thus may attract a particular group of participants. I diversified my sample in the focus groups study by interviewing patients in the parent-child health retreat clinic. Overall, however, in my dissertation, well-educated mothers are overrepresented, which could limit the generalizability of my findings. Online resources were found to be particularly helpful for less privileged mothers (Sarkadi & Bremberg, 2005) and it was also discussed that maternal guilt might be a phenomenon that can mainly be observed for privileged mothers (Sutherland, 2010). Thus, there are reasons to believe that smartphones might be a tool that less privileged mothers use more successfully. Testing this assumption is particularly interesting to research in future studies.

I also could not explore all factors which I discussed in the literature review and focus groups in the final experience study. For instance, the constructs of coping flexibility and effort that we discussed as important in the literature review are not assessed in chapters three and four. Similarly, self-assurance, a prominent point discussed in the focus groups, was not investigated in both chapters. Although they were not part of the chapters, some of these

constructs were measured in the experience sampling study. Thus, they can be the focus of additional projects. This point leads to one of my dissertation's strengths: The adherence to open science principles which allow other researchers to comprehend my studies and also analyze the data for further research questions.

Strengths

I see five main points as the most important strengths of my dissertation. First, in all studies of my dissertation, I employed open science principles. From the scoping review, we shared all material and the bibliography file, including all coded articles and codes. For the focus groups study, I similarly shared all material (e.g., the codebook) and additional quotes for each of the points I made in the paper. Lastly, the experience sampling study was preregistered, and again, I shared data and material openly. Thus, concepts that we could not assess within the length of the two papers can be investigated by myself or other scholars in the future.

Second, my dissertation combined a systematic literature review and qualitative and quantitative data collection. The systematic scoping review provided a sound basis for an overview of relevant theories and different research designs on which I could build the empirical studies. The combination of quantitative and qualitative designs had the advantage that the drawbacks of each research design could in part be mitigated by the other study (Kelle, 2006). The focus groups results could give in-depth insights into the motherhood context and emphasize factors that were not discussed in previous research. The experience sampling study could confirm the generalizability of some of the findings of the focus groups study. In my opinion, the variety of methods used in my dissertation yielded interesting and reliable results.

The large experience sampling study also represents a significant strength of my dissertation. As already discussed in my introduction, experience sampling methods offer many advantages that allowed me to capture the circumstances of maternal smartphone use in

stressful situations in great detail, with high ecological validity, and few recall problems (see, e.g., Scollon et al., 2003). For experience sampling designs, I recruited a rather large sample size of over 200 mothers. Thus, findings from the experience sampling study provide unique and detailed insights into maternal smartphone use in stressful situations directly from everyday life.

Related to the methodological strengths, my dissertation is of great practical relevance. As the experience sampling and the focus groups study are characterized by a high ecological validity, my findings can be translated relatively directly into practical, actionable advice for mothers. The specific focus on stressful situations and on mothers facilitates the provision of tailored advice for my target group. However, as many questions still remain open, future research is still necessary to expand on the initial suggestions formulated in my dissertation.

Finally, although my dissertation did not develop a new model, it did contribute at several points to advance constructs, conceptualizations, and perspectives that I believe are important for future research. First, I developed a placement of media in the transactional model of stress and coping. Second, I emphasized the concepts of coping effort, coping flexibility, and coping tool science as important constructs for future research. Third, the social constructivist viewpoint on media use and media effects can contribute a refined perspective on media perceptions, their social construction, and their effects, offering important theoretical considerations for the future differentiation between objective and perceived media use.

Conclusion

In my dissertation, I studied how mothers use their smartphones to cope with stressful situations. I showed that mothers use their phones to distract themselves from stressful encounters and to find information and support. In stressful situations in which mothers used their phones, they experienced a smaller stress decrease. Using positive phone content, however, was related to more coping effectiveness. My dissertation also demonstrated that social norms around maternal smartphone use play an important role when mothers use their phones

for coping. Mothers, who perceived that others evaluated parental smartphone use as inappropriate, reported increased feelings of guilt when they used their smartphone. Increased feelings of guilt for using their phones, in turn, were related to a decreased coping effectiveness. These findings can be translated into advice for mothers on how they can use their smartphones to their advantage.

However, many questions still remain open. Smartphone use has made media use and effects more complex, as usage contexts have diversified. This offers many opportunities but also problems for the individual user and for us as researchers. Due to the multitude of usage contexts, potential benefits, and drawbacks of smartphones, it is unlikely that our research will produce easy answers to the question if and how smartphones can be used beneficially for the individual and their loved ones in stressful situations and beyond. This is similarly true for mothers of young children: While for some mothers, deleting most apps might be the right choice, for others, the best way forward will be to stop feeling guilty about using their phone while being with their children. My dissertation provides some starting points for parents, counselors, and further research to, in the future, provide differentiated, research- and theory-based, and actionable recommendations for mothers on how they can make the most use out of their smartphones.

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