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Abstract

When measuring media habits, most scholars rely on retrospective self-reports about behavioral frequency, context stability, or automaticity of the performance. The paper develops a new implicit measurement for media research to complement existing approaches, which focuses on measuring the initiation of general, goal-related habits. In the response-frequency measure of media habit (RFMMH) participants are presented with several media use goals and are asked to choose quickly and without deliberation the media device (television set, radio set, newspaper, computer, mobile device) they would use. The more often a media device is chosen the stronger the mental script to choose this device should be and the stronger the habit is assumed to be. The results of a validation study confirm that the RFMMH correlates positively with other habit measures. This suggests that the RFMMH may add a valuable instrument to habit research.

Keywords: response-frequency measure, mental scripts, media use, habit, implicit measures

Habitual Initiation of Media Use and a Response-Frequency Measure for its Examination

Media use is often said to be a habit, especially when people use media repeatedly or in similar situations every time. Program planners and marketing consultants, too, show interest in habits as they are expected to positively influence consistent media use and guarantee permanent rating, steady sales numbers, and a continuous and predictable audience (e.g., Cooper, 1996; Eastman & Ferguson, 2002). Apart from its popularity in lay communication and media practice, the term habit also attracted scientific interest over the years (e.g., Cooper & Tang, 2009; Kang, 2002; LaRose, 2010; Papacharissi & Mendelson, 2007; Rubin, 1981, 1983, 1984). This gives rise to the question how media habits can be adequately measured when – as is the case of habits – the behavior is not performed consciously. As a fundament to developing a habit measurement, the paper first gives an elaborated definition of media habits. Especially, it distinguishes between four types of habits that differ in the nature of cues that trigger the habit and in the stability of these cues. The paper then discusses existing approaches to measuring habits and reviews the response-frequency measure of habit (RFM). The RFM has been developed and tested in social psychological research on public transportation and car use habits. Based on the RFM, the present paper develops an implicit measure for media habits, the response-frequency measure of media habits (RFMMH). The measure adheres to the fact that verbal self-reports on past behavior are concerned with problems of validity and reliability. Thus, instead of directly asking people to remember and report their media habits, the RFMMH is a more covert approach. The paper presents the results of an empirical study applying the RFMMH and discusses the results of several tests of construct validity and reliability.

Defining Media Habits

Habit is defined here as an automatically initiated behavioral response stored in a mental script which an actor performs in repetitive, familiar situations (Aarts, Verplanken, &

van Knippenberg, 1998; Author, in prep.; Camic, 1986; Esser, 1996; Hull, 1943; James, 1890; Renckstorf, 1996; Schütz & Luckmann, 1973; Stone & Stone, 1990; Triandis, 1977; Verplanken & Aarts, 1999; Verplanken, Aarts, van Knippenberg, & van Knippenberg, 1994; Verplanken & Orbell, 2003). When faced with a previously unknown problem, actors need to consciously deal with the situation, search for alternative solutions, and perform the one that seems most promising (e.g., Ajzen & Fishbein, 1980, 2005). They might repeat this thoughtful elaboration when a similar situation arises again. If the circumstances have not changed, actors might again decide deliberately for the same behavioral reaction. If they experience such a situation repeatedly, actors form a permanent schematic structure in the semantic memory (LaRose, 2010; McClelland, McNaughton, & O'Reilly, 1995; Saling & Phillips, 2007; Strack & Deutsch, 2004; for factors influencing elaborate decision making despite repetitive experiences see Betsch, Brinkmann, Fiedler, & Breining, 1999; Fazio, 1990). This kind of mental model containing procedural information is called a script (Abelson, 1981; Hastie, 1981; Schank & Abelson, 1977). A script represents a typical context, a behavioral response in these circumstances, and expected results of the behavior. It is a mental link of the situational characteristics and an appropriate behavioral option. If a person experiences a certain situation associated with similar behavior more often, it is likely that the script is easily accessible and will be retrieved. When the actor is faced with such a situation again, the script is activated (Abelson, 1981). The actor then does not elaborate on all aspects of the circumstances and optional means in deliberate decision making, but the script is automatically initiated. The behavioral response stored in this mental script is the habit. We hereby differentiate between two phases of the habit process: Habit initiation and habit performance or habitual behavior. Whereas the first refers to the “the entry path leading to the script” (Abelson, 1981, p. 723), the latter refers to the subsequent behavior stored in the script.

Habit initiation needs less attention. The conscious mental involvement in the activation of a behavior is decreased. Habitual choice is performed with lack of awareness and low consciousness and in consequence is less controllable (Bargh, 1994; Bargh & Gollwitzer, 1994; Betsch, Glöckner, & Haberstroh, 2000; Friedrichs & Opp, 2002; Limayem, Hirt, & Cheung, 2007; Neal, Wood, Wu, & Kurlander, 2011; Rubin, 1981, 1983, 1984; Triandis, 1977; Verplanken & Aarts, 1999; Verplanken, Aarts, & van Knippenberg, 1997; Verplanken & Orbell, 2003; Wood & Neal, 2007). Following from the explanations of how a script is formed and activated, we can conclude that repetition is a necessary, but not a sufficient condition of habit acquisition. Results from Verplanken (2006) point in this direction: Within an experiment he manipulated the ease of habit acquisition by task complexity while keeping the number of repetitions constant. As hypothesized habit strength was stronger for those performing the easier task, clearly differentiating habit strength and behavioral frequency. Still, even in this case, repetition was necessary to form a habit.

Once activated, the scripted behavior itself can be performed automatically (e.g., smoking without thinking about it) or with high awareness and involvement (e.g., watching the course of events of a habitually chosen daily soap). Therefore, not the whole script is necessarily run automatically and variations may occur amongst others due to a more or less fixed order of events, flexibility toward variables in the script instantiation and the script may even contain steps that require thinking and decision making and that can change the further run-through (Abelson, 1981). What is decisive, however, and unites all habits, is the automatic activation of the script. Within this paper, we therefore are specifically interested in habit initiation as the starting point of any habitual behavior. To sum up, habitual media selection refers to the initial activation of the script, which is the entry path to the script. Habit performance is the behavior stored in the script. In the following, we will refer to

"habits" if no separation between the two phases is necessary. Otherwise, we will state to which of the two components we refer.

We need to clarify how simplified, script-based processing is activated: The mental structure is triggered by the perception of typical attributes of the situation, so-called cues. Representations of these cues are also stored in the script which links these characteristics to the behavior. Two factors deserve specific attention in this regard: the nature of the cues and the level of stability of the cues. Examining cues that can stimulate a script and hence a distinct habit, a branch of researchers consider external factors of the context like time, place, and surroundings (Danner, Aarts, & Vries, 2008; Ji & Wood, 2007; Konig, Renckstorf, & Wester, 1998; Neal et al., 2011; Verplanken & Wood, 2006; Wood & Neal, 2007; Wood, Quinn, & Kashy, 2002; Wood, Tam, & Guerrero Witt, 2005). Such external cues might directly trigger habitual initiation of behavioral responses because of "direct context-response associations that develop from the repeated co-activation of the context and the response" (Wood & Neal, 2007, p. 845) or because the external cues "signal opportunities to perform rewarded responses" (Wood & Neal, 2007, p. 846). This focus on external cues has been critiqued for degrading habitual processes to purely behaviorist reactions to environmental patterns. Other scholars emphasize the relevance of internal factors of the individuals to cue scripts and hence habits (Aarts & Dijsterhuis, 2000; Renckstorf, 1996; Verplanken & Orbell, 2003). Such internal psychological states or mental processes can be repetitive internal thoughts, moods or goals of the individual (see also Knobloch, 2006; Zillmann, 1988). This view on the goal-dependence of habits indicates a stronger emphasis on need satisfaction through habits which originated from intentional, goal-directed action. The notion of habits being goal-dependent has received critique, too. In their thorough differentiation of cuing mechanisms, Wood and Neal (2007) see automatic goal pursuit as a different sort of automaticity because goals can be achieved by different means. Despite the relevance of this

differentiation, it does not exclude the option of repeatedly experienced goals to serve as triggers for scripts that lead to identical behavior every time, thus to a habitually started response. The notion of goal-dependent habits (Aarts & Dijksterhuis, 2000; Verplanken & Aarts, 1999; see also for goal-dependent automaticity Bargh, 1994, and for "self-presented" contexts for script activation Abelson, 1981, p. 719) – although temporarily put aside (Verplanken & Wood, 2006) – has been readopted by several researcher who give examples of goal-dependent habits (Verplanken & Melkevit, 2008): News junkies show strong news consumption habits "prompted by a need to escape from their everyday routines" (Diddi & LaRose, 2006, p. 206). A "person routinely triggers the TV button whenever she feels lonely" (Hartmann, 2009, p. 37). Sheeran and colleagues (Sheeran, Aarts, Custers, Webb, Cooke, & Rivis, 2005) find prove that stimulating the goal of socializing activated automatic drinking behavior in participants with drinking habits. Habits might not lead to optimal effectiveness in the sense of maximizing gratification outcome, but they deal efficiently and reliably with repeated problems. Unless circumstances have changed, habitually initiated behavior is in line with an individual's (long-term) goals and thus effective (Hartmann, 2009; LaRose, 2010). This, however, is not always the case. The automatic response may have been rewarding and satisfying in the past but, as circumstances change, it may become less effective in serving the recurring goal. Hartmann (2009) refers to bad habits when the habitually instigated behavior diverges from attitudes and is beyond volitional control and current intent. Although these bad habits are activated automatically, the individual may regret to have responded in the habitual way (even while still performing the habitually activated behavior). This stresses the importance to separate habit initiation and performance: In this case, the selection process is automatic, but not necessarily the subsequent behavior (Verplanken & Melkevik, 2008). While the four sub-dimensions of automaticity – lack of control and awareness, current unintentionality and efficiency – may independently apply to

the initiation of the behavior they may also apply independently to the subsequent execution (Bargh, 1994; Bargh & Chartrand, 1999).

Regarding the necessary stability of cues to trigger a habitual response, it is in line with literature on scripts as well as habits that a recent situation does not need to perfectly match its mental representation (Abelson, 1981; Davidov, 2007; Wood, et al., 2002). While it is broadly accepted that stable stimuli might be relevant during habit formation, there is empirical evidence that later media habit initiation is less dependent on context stability. In a reanalysis of Ouellette and Wood's (1998) data, Ajzen (2002) finds no difference in the influence of past television viewing behavior and of intentions on later television viewing behavior depending on the stability of the viewing context, concluding that media habits might be less context-dependent than assumed so far (Newell, 2003). LaRose (2010) puts forward the argument that, because of the variety of media contents and the manifold gratification potential of media use, media habit activation may be less dependent on stable situational circumstances but might be adequate in many situations. The mental structure that leads the scripted response might be subject to a continuous process of restructuring and reorganization of the stored circumstances and adequate habitual behavior. This notion is also found in Verplanken and Aarts' (1999) proposition that we may differentiate between habitual processing that refers to specific situations with specific cues and call for a specific behavior, and habitual processing at a more general level which is under the control of cues that appear in many different situations. We argue that media use is a behavior that is suitable to satisfy a variety of needs. When media use repeatedly proves to fulfill these needs, script-based processing might become common despite changing goals and contexts.

From these differentiations of the nature of cues and the stability of cues, we conclude that four types of habits can be categorized: 1) specific habits cued by stable external circumstances, 2) general habits cued by a variety of situational circumstances, 3) specific

habits that depend on a recurring and specific goal, and 4) general goal-related habits that are triggered by a variety of goals which have all been successfully satisfied by the habitual behavior in the past. We will follow up on the fourth perspective in the latter part of the paper when we develop a measure that refers to habitual processing triggered by varying goals and applicable to many situations resulting in general media use habits.

Measuring Habit Strength

Measurement of habits is manifold and mostly depends on those of the above mentioned aspects which the respective scholars consider most important (or most convenient to measure). In this chapter we will review existing approaches of habit measurement. As a consequence of their strengths and pitfalls we will introduce a rarely regarded procedure from social psychology to media use research: the response-frequency measure of habit (RFM), which will be described in the latter part of this chapter.

Self-Reports on Behavioral Frequency

Repetition is the least controversial element in the definition of habit. As a consequence, habit measurement mostly focuses on indicators of repetition of behavior, number of performances in a defined time span, or behavioral frequency. It is assumed that the more repetitively a behavior is performed, the more the actor relies on a mental script and automatically initiates the behavior instead of deliberately selecting it. The indicator is burdened with three major problems: First, investigation of behavioral frequency mostly relies on retrospective self-reports (e.g., Ronis, Yates, & Kirscht, 1989; Wood, et al., 2005). These reports suffer from reliability and validity problems as participants use estimation and inference strategies to recall the frequency of behavior. They may properly recall outstanding events that have high subjective relevance, but they misjudge the frequency of repetitious everyday activities. This bias is even stronger for less consciously (and habitually) initiated behaviors (Menon, 1993; Schwarz, 2007). Second, as long as studies only focus on the

measurement of repetition, they lack content validity as they omit measuring script-based information processing, limited awareness, consciousness, controllability, and intentionality. Repetitious behavior may also be the result of repetitious active deliberation on a recurring situation (Ajzen, 2002). Furthermore, as repetition measures relate to the behavioral response and not the habitual initiation of the behavior, they cannot capture the difference between the two phases. Third, while repetition itself is necessary to store a scripted response during habit formation, habitual processing is not necessarily performed often and in short time intervals. LaRose (2010) for example raises the case of habitually watching the super bowl once a year. Such rarely, but recurring scripts are hardly captured by common measures of behavioral frequency.

Self-Reports on Habit Strength

Multi-item self-report scales of habit strength cope with the mentioned problem of content validity. Besides asking about perceived behavioral frequency, scholars using such scales ask participants if they perform a specific behavior automatically, that is with limited consciousness, awareness, controllability, intentionality, and with high efficiency. Furthermore, some authors use items on self-assessment of the habitual character of the behavior by the respondents (e.g., "…it's a habit of mine", Diddi & LaRose, 2006, p. 207, for similar approaches see Knussen, Yule, MacKenzie, & Wells, 2004; LaRose & Eastin, 2004; LaRose, Lin, & Eastin, 2003; Limayem et al., 2007; Trafimow, 2000; Verplanken & Orbell, 2003). Surely, up to date these multi-item measures are the most advanced and most content valid approaches to measuring habit strength. Especially the self-report index of habit strength (SRHI) by Verplanken and Orbell (2003; Verplanken, Myrbakk, & Rudi, 2005; see also Gardner, de Bruijn & Lally, 2011), which systematically includes all definitional dimensions of habit strength, constitutes a valuable indicator. Although the authors miss to thoroughly assign the items to the dimensions, an allocation is possible: Lack of awareness is

measured by four items (Behavior x is something… “I do without having to consciously remember”, “I do without thinking”, “I start doing before I realize I’m doing it”, and “I have no need to think about doing”), lack of controllability by three items (“I do automatically”, “that would require effort not to do it” and “I would find hard not to do”), and repetition by three items (“I do frequently”, “that belongs to my (daily, weekly, monthly) routine”, and “I have been doing for a long time”).

While the theoretical understanding of habit that underlies the construction of the SRHI is in accord with the one proposed in this article, the SRHI measures both, habitual initiation and habitual performance of a behavior. The items on lack of awareness relate mainly to the unconscious initiation process and the items on lack of controllability relate mainly to the automatic execution of the scripted behavior. Whereas, at first sight, this results in a more complete measure of habit strength, it mingles the two phases and might therefore produce spurious results: As stated above, the automatic initiation of a behavior does not necessarily correlate with high automaticity of the subsequent behavior.

It has been discussed whether the repetition dimension should be dropped from the scale, as habit strength cannot be equated with behavioral frequency or repetition (LaRose, 2010). At least in studies predicting behavioral frequency from habit strength, using a measure of habit strength that includes repetition may produce circular results. Still, repetition is one of the constituting elements of habits, differentiating them from other automatic processes (Verplanken & Orbell, 2003). Yet, infrequent habits and habits executed in long time intervals will not be properly measured given the items aim at frequency and assessable time spans. Therefore, keeping or dropping the repetition dimension depends on the research interest. Additionally, the SRHI in its original form contains an identity element, measured by two additional items. The authors themselves, however, suggest that the identity

dimension does not necessarily belong to the habit construct (Verplanken & Orbell, 2003). Therefore, some studies exclude this dimension when using the SRHI.

Self-report scales in general may suffer from problems of validity. People only have limited ability to report on mental processes (Nisbett & Wilson, 1977). Especially reports on originally unreflected, less conscious processes give rise to post hoc rationalized answers and social desirability bias.

Self-Reports on Context Stability

Habits are activated in well-known situations. The actors do not need to delve into elaborate information processing; however, triggered by cues they can retrieve a script and automatically initiate the behavioral option stored in this script. Based on this notion, several scholars measure the stability of the situation by asking for the respondents' self-reported estimation on how consistently they perform a behavior at a stable time, a stable place, to satisfy the same goal etc. Researchers presume that these situational circumstances serve as cues that trigger the script and hence the habit. They regard selection processes of behavior in stable situations more likely to be initiated automatically. Habit strength is thus measured by the degree of context stability (Danner et al., 2008; Ji & Wood, 2007; Konig et al., 1998; Neal et al., 2011; Verplanken & Wood, 2006; Wood & Neal, 2007; Wood et al., 2002; Wood et al., 2005). The strength of measuring context stability lies in refraining from asking for self-reports about the consciousness of activities. However, circumstances of media selection may not always be perceived with high awareness or well-remembered. The cues that trigger script-based processing may be quite individual and differ intra-individually, depending on the specific behavior. Especially habitually initiated behaviors performed in long time intervals are assumed to be instigated by specific cues that appear only rarely (like the super bowl context). In addition, the stability of the context admittedly enables script-based information processing, but unchanged circumstances do not axiomatically stimulate solely

habitual responses instead of elaborate decision making (Betsch et al., 1999; Fazio, 1990). Furthermore, Verplanken and Aarts' (1999) above-mentioned proposition of general habits and LaRose's (2010) argument on the general character of media habits suggests that these might not be ideally measured by focusing on the consistency of specific circumstances, but would rather require measuring the backdrop on media use to satisfy a variety of needs (see type 2 and 4 habits above).

Response-Frequency Measure of Habit

The response-frequency measure of habit (RFM) was developed and used in research programs on travel mode choices (originally Verplanken & Aarts, 1999; Verplanken et al., 1997; Verplanken, Aarts, van Knippenberg, & Moonen, 1998; Verplanken et al., 1994; see also Bamberg, Rölle, & Weber, 2003; Klöckner & Matthies, 2004, 2009; Klöckner, Matthies, & Hunecke, 2003; Matthies, Kuhn, & Klöckner, 2002). It is an alternative approach to measuring information processing depth in habitually initiated behavior based on a more covert procedure without requesting respondents to reflect upon automaticity (implicit measure; see e.g., Fazio & Olson, 2003; Hefner, Rothmund, Klimmt, & Gollwitzer, 2011). It specifically focusses on habit initiation. The RFM takes into account the unconscious character of habits and focuses on the strength of the association between a cue and a behavioral response. The personal script of an actor links external stimuli and internal psychological states to a behavioral option which, in the past, successfully responded to these circumstances or helped reach this goal. Participants of the RFM measure are presented with a variety of (mostly 10 to 15) travel destinations which are designed to differ from one another as much as possible in their characteristics. Examples are "visiting a friend in a nearby town", "attending class at university", "visiting a pub in the evening", or "shopping for daily needs" (Klöckner & Matthies, 2009; Verplanken & Aarts, 1999; Verplanken et al., 1994). These descriptions are supposed to serve as cues for situations in which certain goals

are relevant. Participants have to choose the transportation mode (i.e., car, bike, bus, train, or walking) they would use in the respective situations (Klöckner & Matthies, 2009; Verplanken & Aarts, 1999; Verplanken et al., 1994). Habit strength is indexed by the number of choices of a specific travel mode across the different situations. So far, the RFM has only been applied to the arena of travel behavior. All situations have in common that the respondent needs to travel there. However, the stimulus situations represent a manifold set of goals connected to them, for example entertainment (going to a pub), education/information (attending class), or satisfaction of basic needs (grocery shopping). The actions taken to obtain the goals, that is the travel mode choices, are instrumental in satisfying these goals: "[W]e do not automatically take the bicycle out of the shed and subsequently ride to the university without having a goal to go there" (Aarts et al., 1998, p. 1358). The travel destination represents a goal that triggers the script (habit initiation) which entails taking the bicycle to be an appropriate behavioral option in the current situation (habit performance).

To ensure that answers are spontaneous associations instead of deliberate decisions on the basis of recalled situational characteristics, time pressure is imposed in the RFM. Some authors merely ask participants to answer as quickly as possible (Bamberg et al., 2003; Klöckner & Matthies, 2004, 2009; Matthies et al., 2002; Verplanken et al., 1998), others record and control answering time (Klöckner et al., 2003). To further elicit that respondents rely on their personal scripts about how to satisfy the given needs, information about the situations and the respective needs is strictly limited.

To sum up, the RFM measures the strength of cue-response links in habit initiation by counting the number of activations of a certain behavioral option in a variety of contexts. It is able to measure general habits that do not relate to specific circumstances or goals, but to a variety of possible goals that can be satisfied with a behavior (for an approach to modify RFM to specific habits see Klöckner et al., 2003). Thus, the RFM measures habits of the

above mentioned fourth type. The measure consists of a variety of different situations to make it less vulnerable to idiosyncratic responses to one type of goal (Verplanken et al., 1997). It cannot measure specific habits that are initiated only after recognizing a specific external or internal cue like this assumedly is the case for infrequent habits that are related to special circumstances (e.g., going to watch the super bowl in a pub; for such scripted behavior also compare the term ritual which refers to repeated behavior, not necessarily in short time intervals, which is celebrated by formal means and contains symbolic meaning; e.g., Rothenbuhler, 1998). Respondents have to rely on their preexisting scripts on how to satisfy diverse needs which are also related to travel decisions. When people reveal a high level of invariance in their answers pertaining to the stimulus situations, this is assumed to indicate the existence of a broad habitual tendency to respond to diverse situations by using the same travel mode.

The RFM has been less widely used than the other habit measures. So far, it has only been applied by social psychologists to measure habitual travel mode choices. A number of studies have used and validated the RFM. The measure correlates significantly with self-reported frequency of travel mode and predicts travel mode choice. It correlates significantly and negatively with information search behavior. It shows high test-retest reliability (Aarts, 1996; Verplanken et al., 1997; Verplanken et al., 1998; Verplanken et al., 1994). Critics of the measure raise three issues: They argue that the responses given in the response-frequency procedure may tap mere preferences or attitudes rather than habits. This is an empirical problem at first. It may be that any habit measure correlates with a person's attitudes and preferences because habits develop from satisfactory behavioral solutions to recurring situations that conform to one's attitudes and preferences. Unless circumstances changed radically, habitual selection of a well-known and previously satisfying behavior is in accordance with existing attitudes and preferences. Thus, habits are closely related to these

two constructs. Still, habits differ: Attitudes are favorable or unfavorable evaluations of an object (Fishbein & Ajzen, 2010). Preferences are value judgments. Their construction involves the weighing of options ("I prefer x over y"), and they can influence deliberate decision making processes (Strack & Deutsch, 2004; Weber & Johnson, 2009). Habits, however, are automatically initiated behavioral responses when a procedural script containing the behavior is activated. Verplanken et al. (1997) provided evidence that RFM actually measures this script-based processing and not merely attitudes and preferences: The researchers found that simplified, habitual processing aligns with less information search because the habitually started behavior is well learnt and automatically activated. Little information is needed and sought to take a proper decision. Controlling for attitudes did not change this negative influence of habit strength measured by RFM on information gathering about travel options. If RFM and attitude measures tapped the same construct, controlling for attitudes would have eliminated the correlation. Thus, although attitudes and preferences influence the deliberate formation of behavior that might become habituated after repeated performance, they are conceptually distinct from habits. A related concern is that simply that travel mode is chosen which best fits the respective situation and the respondents rationally choose the option that leads to the most desired outcome. The construction of RFM prevents this rather deliberate decision making by imposing time pressure. The third doubt concerns the imposed time pressure in the administration of the procedure which could interfere with the motivation to expend mental effort on the task. However, the RFM of travel mode choice has been shown to be unrelated to need of cognition (Verplanken et al., 1997).

Given its ability to approach habits without self-reports and to focus on the automatic initiation of habits as elements of mental representations, we propose to adapt the RFM to media habits (pretest) and elaborate on its validity (main study).

Development of a Response-Frequency Measure of Media Habit and Pretest

Modifying RFM of travel mode choice to a response-frequency measure of media habit (RFMMH) raises two important questions: Which categories should be proposed as answers and which cues conform to the original RFM? To answer these questions, we reflect on the similarities and differences between locomotion behavior and media use behavior.

Media Device Use as Response Categories

RFM focuses on general locomotion habits by addressing several situations in which people have to choose deliberately or automatically which travel mode to use. These specific locations prompt a variety of different goals (Aarts et al., 1998). Travel mode choice is instrumental for achieving these various goals. Thus, RFM measures habits of the above mentioned fourth type. It measures goal-related habits that are general in the sense that the same response can be instigated by several goals, because the behavior has successfully satisfied these diverse goals. The use of, for example, the car helps cover a distance which allows fulfilling the need for shopping or seeing friends. We may thus think of the travel mode as a mediator to the respective goals. Like different travel modes, media use can be instrumental for achieving a variety of goals. Communication research provides extensive literature on potential goals connected with media use (e.g., LaRose & Eastin, 2004; McQuail, 1986; Papacharissi & Rubin, 2000; Rubin, 1983; Stafford & Stafford, 2001). These goals may serve as internal cues, triggering respective scripts and hence habitual media selection (Aarts & Dijsterhuis, 2000; Renckstorf, 1996; Verplanken & Orbell, 2003).

A first difference between travel and media behavior needs consideration: The expected outcomes of media use are not entirely reliable, whereas it is quite predictable that one will successfully reach one's destination with a certain travel mode. This argument of difference fully applies to newly adopted media devices. However, only media device use that has been successfully repeated in the past becomes habitually instigated in the future.

Unless turned into a bad habit, media users can thus expect a reliable outcome of their automatically chosen media behavior.

Second, many travel options can be applied to bridge short as well as larger distances and help satisfying many goals (e.g., shopping in the nearby supermarket as well as relaxing in the far away holiday home). Still, not every travel mode is this broad. The target places reachable by foot are limited and trains or planes are only efficient for long distances. Considering this, not every single media will successfully satisfy every need of a user. Especially specific media content fulfills limited functions for a user. For example, news broadcasts are mainly used for information, comedy shows are used for entertainment purposes, while people might only rarely consider these contents to fulfill information as well as entertainment needs. Still, it can be argued that media devices can be used to obtain different outcomes. Especially television and computer have a broad gratification potential and are used for information, entertainment as well as escapism and other outcomes. We conclude from this that the RFMMH, which measures general goal-related habits as does the original RFM, does not apply to the habitual selection of specific media content, but mainly to media device selection (i.e., television set, radio set, newspaper, computer, and mobile device) in general because devices can be used to obtain a variety of outcomes (see fourth type of habits above).

Cues

As mentioned above, media can satisfy different goals. Thus, the present study develops a first version of the RFMMH that contains a variety of media-related goals as potential cues of habitual device choice. Theoretical dimensions of media use goals were included, namely escapism, entertainment, media-stimulated interpersonal communication, and information. For each dimension, six items were formulated for the pretest. The items introduced the respondents to situations in which they would search for the respective

gratification (see Appendix for the final list of situations). Specific gratification dimensions, such as social (in the sense of gaining social support), status, or economic outcomes (LaRose & Eastin, 2004) which are mainly applicable to internet-equipped media devices, were excluded.

The RFMMH cues do not contain external circumstances such as time or place. Surely, the RFM items relate to places like “going to a pub”. These should, however, not be mistaken as situational, external cues, as the “pub” (as a place) in the aforementioned example cannot function as an external trigger for the locomotion choice, because the actor does not see it at the moment of habit instigation. The script is activated by the goal to go there (and the planned activities upon arrival, like meeting friends). The items do not contain any contextual cues, because the RFMMH is not supposed to measure the media device that best fits the respective situation and is the rationally best choice in the given situation, but the habitual choice when the general goal is activated.

Administration of the Measure

The measure is suitable for a self-administered online-questionnaire. Participants are presented with 24 cues. The items are formulated in very short sentences to reduce reading time. Respondents are instructed to indicate spontaneously and without further thinking which media device they would choose to reach the respective goal. Only devices which the participants stated to use at least seldom are included in the RFMMH response categories for the respective participant. The order of the media devices is randomized between respondents to prevent sequence effects. As the presented situations do not necessarily result in media use, the respondents are also given the additional response category “I would do something else”. When a respondent has made a choice for a situation, the online questionnaire automatically switches to the next situation, prohibiting that the respondent changes the answer. As the items do not provide much information with respect to the situation and as time pressure is

imposed, deliberation is inherently prevented. We are aware that this procedure reduces external validity as participants may indeed elaborate in situations of media choice. However, the procedure increases internal validity of the script-based choice, which is the core interest of the study.

Pretest

To test the practicability of the situation items and the response categories, we conducted a comprehensive pretest under laboratory conditions. Sixty-one communication research students participated. The time needed to read the items and give an answer was recorded for each situation. Seventy percent of the respondents answered all 24 situation items; on average, 0.8 items were skipped. The average time taken to read and answer the items was 3.65 s (*sd* = 1.97), ranging from 2.78 s (*sd* = 1.82) to 5.63 s (*sd* = 2.82). The pretest showed that an optimal time span to induce time pressure while at the same time allowing the vast majority of respondents to read the items and to give an answer was 7 s. Most items were read and answered within this timeframe (*m* + *sd*).

The number of goal cues was reduced for the main study based on the following rules: Items were eliminated which (a) took more answering time (*m* + *sd* > 7 s), (b) were skipped by a larger group of respondents (> 10%), and (c) were answered with “I would do something else” by more than 50% of the respondents. This reduced set of 16 cues was used in the main study.

Main Study: Construct Validation and Test-Retest Reliability of the Response-Frequency Measure of Media Habit

To test the applicability of the RFMMH under field conditions, to examine its descriptive qualities, and to test its construct validity and reliability over time, we conducted a main study. The RFMMH procedure allows investigating habit strength concerning all presented media devices. In this study we shall concentrate on television habits and computer

habits. To test construct validity we investigate correlations between the RFMMH and traditional measures of habit, namely self-reported behavioral frequency, the multi-item self-report index of habit strength (SRHI), and context stability. It is assumed that the RFMMH shows positive correlations with these measures.

H1: RFMMH of television/computer use correlates positively with self-reported frequency of television/computer use.

H2: RFMMH of television/computer use correlates positively with self-reported habit strength of television/computer use.

H3: RFMMH of television/computer use correlates positively with self-reported context stability of the television/computer use situation.

We expect correlations to be significant but only moderately high, because the measures focus on different aspects of the construct of media habit. Frequency of media use is a necessary precondition, but not sufficient for habitual media use and does not separate between initiation and performance. Multi-item measures depend on retrospective self-reports on perceived automaticity. They do not explicitly differentiate between initiation of a behavior and its execution, as has been distinguished in this article, and RFMMH is designed to specifically measure habitual initiation. Moderate correlations are found in validation studies in transportation research (Klöckner et al., 2003; Verplanken et al., 1994; Verplanken & Orbell, 2003). Context stability can lead to the formation of a situational script and the activation through situational cues. However, people do not necessarily react habitually to repeated cues.

Finally, we assess test-retest reliability. Habits are assumed to be permanent influences on behavior. Habits are by definition rather stable over time as long as a person's time resources, media equipment, and media content do not change drastically.

H5: Test and retest values of the RFMMH correlate positively.

Method

Sample

We conducted an online survey among students. We decided to limit the study to a homogeneous sample to control confounding variables such as cognitive skills and computer affinity. Of course, this approach leads to a lack of external validity. It is, for example, likely that other population groups differ in their time needed to complete this task. However, the advantage of a higher internal validity in this stage of validation outweighs this disadvantage. It was not possible to randomly select individual students as a register of the population for academic research does not exist. To reach an unbiased sample of students, we used a comprehensive list of student associations and faculties of German universities which forwarded information on the survey to their student members. As the sample covers a wide variety of fields of study (social science: 28%, natural science and math: 25%, humanities: 12%, linguistics/languages: 11%, engineering: 6%, other: 15%, no answer: 3%), biased results, following for example from researching mainly social science students, are unlikely. Of the 1,008 people who saw the introduction page 719 (71%) completed the interview. 102 cases were excluded from the analysis (less than two thirds of the RFMMH items answered (n = 4), no students, etc.), leaving 617 respondents for the subsequent analyses. The mean age is 23.8 (sd = 3.35), 64% are female. 356 (58%) consented to participate in the retest. Response rate in the retest was 70%, resulting in 247 valid questionnaires.

Measures

Media availability. To keep the RFMMH as parsimonious as possible, respondents indicated which media devices they used at least seldom. Only those devices were included into the individual RFMMH for every respondent. On average, the respondents use four to five media devices (*mdn* = 5, *m* = 4.4, *sd* = 0.78). Whereas the computer is used by all but one of the respondents, 21% never use a television set.

Frequency of television/computer use. Respondents estimated the average number of hours per week they used television/computer. Skewness (television: 1.53; computer: 1.10) and kurtosis (television: 3.36; computer: 1.02) indicated extreme values for some of the respondents. Using casewise diagnostics, we identified outliners (> 3 *SD*). In total, six outliners (two for television, four for computer) were identified and excluded from further analyses, leaving 611 valid cases. Table 1 contains the descriptive statistics without the outliners.

RFMMH. Sixteen items, chosen from the pretest covering the goal dimensions information, entertainment, escapism, and media-stimulated interpersonal communication, were included (see Appendix). With one exception, the procedure was identical to the pretest: A countdown in the online questionnaire signaled the time left to answer the respective item. When a respondent had made a choice or did not answer within 7 s – the time span identified in the pretest – the online questionnaire automatically switched to the next item. Although the 7-s-criterion itself only exerts a medium level of time pressure, as most respondents stayed well within this timeframe during the pretest, it is comparable to the way time pressure was induced in previous RFM studies. Here, respondents were simply asked to answer as quickly as possible (Klöckner & Matthies, 2004; Klöckner & Matthies, 2009; Matthies et al., 2002; Verplanken et al., 1998). Whereas the direct influence of the experimenter can additionally intensify this time pressure in the laboratory or in face-to-face interviews, no researcher is present during an online questionnaire. By visually implementing the countdown, we aimed

at substituting this (Klöckner et al., 2003). To help the respondents to adapt to this questioning format they answered three test items prior to the actual RFMMH. The timeframe was adequate, 81% answered all RFMMH situations, and only one percent answered less than two thirds of the 16 items. Actual response time was measured in seconds. The latency times for computer (only items included where computer was chosen as an answer) was 3.40 s (*sd* = 0.79) and for television 3.64 (*sd* = 0.94). The difference is significant ($t(342) = -2.29$, $p = .023$).

It is suggested that the more invariant the participants' responses – meaning the more often they selected the same media device across all situations – the stronger their habit concerning the selection of this media device. Thus, television and computer habit strength were indexed by the number of television/computer choices across the 16 items. Table 1 summarizes the descriptive statistics for television and computer RFMMH. Computer habits measured by the RFMMH show a significantly higher mean ($t(481) = 21.01$, $p < .001$) and median compared to television. Skewness and kurtosis indicate satisfactory distributions, except the kurtosis index of television RFMMH is higher.

Self-report index of habit strength. An edited version of the SRHI by Verplanken & Orbell (2003) was included for television/computer. As discussed above, the identity dimension was left out. The repetition dimension was kept, as repetition is an essential element of habits. It is not the aim of the current study to predict behavioral frequency from habit strength, but to compare different measures of this construct. Respondents rated nine statements (e.g., "I switch on the television set without thinking") on a five-point agreement scale. *Cronbach's* α of the scales are .80 (television) and .74 (computer), indicating sufficient internal consistency (Table 1). Skewness and kurtosis indicate good distributions.

Context stability. On a bipolar five-point scale respondents rated whether they used the television/computer in stable or varying circumstances, referring to time (i.e., always at

the same time vs. always at different times), place, activities, and mood. High values indicate high context stability. An index of context stability was computed by counting the number of stable context variables (scale points 4 and 5). Context stability qualifies as a formative measurement model (see e.g., Diamantopoulos & Winklhofer, 2001): The presence (or absence) of the measured variables defines/is causal for context stability; it is not caused by an underlying dimension of "context stability" as in reflective measurement models. Therefore, Cronbach's α or comparable indicators of internal consistency are not applicable to testing the structure of context stability. The index shows how many contextual cues align in a media selection situation for a specific respondent. It theoretically varies between 0 and 4 (Table 1). Skewness and kurtosis indicate good distributions.

Media Preference. Respondents indicated their attachment to each media device by rating how much they would miss it if it was no longer available (five-point scale from 1 *not at all* to 5 *very much*).

Demographic Variables. Respondents' age, gender, and field of study were assessed.

[Table 1 about here]

Procedure

After an introduction and statement on data privacy, participants answered the questions on their media availability and the RFMMH items. Thus, the RFMMH was administered at the beginning of the interview and prior to all other habit measures. The questionnaire then contained a split ballot design. Part of the sample was randomly assigned to the television condition and the other to the computer condition, and answered the questions on media use frequency, the self-report index of habit strength (SRHI), and context stability of the usage situation only regarding television or computer use. As one fifth of the

sample never used a television set, the split is not evenly distributed. A total of 211 answered the television-related questions, 400 respondents answered the computer-related questions. All participants answered the questions on media preferences and demographic variables. Participants who consented to participate in the retest were contacted 50 days after the first survey was closed. The average time span between the two interviews was 75 days (*sd* = 14.65).

Results

In a first step in testing construct validity, we investigate the correlation between the RFMMH and media use frequency. Correlations for computer ($r_{computer}$ = .47, p < .001) and television ($r_{television}$ = .41, p < .001) are moderate. To compare the correlations between the devices, Fisher's Z-transformations were used rendering the independent samples of the split ballot survey design. Correlations between RFMMH and media use frequency do not vary significantly between computer and television (Z_f = 0.88, p = .379). H1 is confirmed.

Secondly, construct validity is tested by comparing the RFMMH to the SRHI. Again, we find moderate correlations for computer ($r_{computer}$ = .34, p < .001) and television habits ($r_{television}$ = .45, p < .001). Coefficients do not differ significantly between computer and television (Z_f = 1.47, p = .141). H2 is confirmed. Compared to the initial validation of SRHI and RFM (Verplanken & Orbell, 2003; r = .58, n = 86, topic: bus habits), the correlation for television habit does not differ significantly (Z_f = 1.38, p = .168), whereas the correlation for computer habit is significantly weaker (Z_f = 2.53, p = .012).

Thirdly, we were interested in the relation of the RFMMH and context stability. Context stability does not correlate with the RFMMH measure ($r_{computer}$= .04, p = .490; $r_{television}$ = .08, p = .243). Even on the level of each single context variable we only find one out of eight possible significant correlations: The stronger the habitual television selection measured by the RFMMH the more often respondents watch television at the same time (r =

.147, p = .032). All other correlations for television and computer are insignificant and weak. H3 is not confirmed. Notably, behavioral frequency and SRHI do not correlate with context stability either (frequency of use: $r_{computer}$= -.01, p = .921; $r_{television}$ = .12, p = .118; SRHI: $r_{computer}$= -.06, p = .235; $r_{television}$ = .12, p = .183).

Results so far point to the validity of the RFMMH. There are, however, two concerns that may be raised. The first points to the potential confounding of habit strength measured by the RFMMH and mere media preference. To handle this criticism, we calculated correlations between general preference and the RFMMH, as well as general preference and SRHI, which is the most reliable and accepted measurement of (media) habits thus far. The RFMMH correlates moderately and significantly with general preference ($r_{computer}$= .44, p < .001; $r_{television}$ = .51, p < .001). Similar correlations are found for general preference and the SRHI ($r_{computer}$= .49, p < .001; $r_{television}$ = .58, p < .001). Thus, both habit measures share variance with media preference. To further test whether this shared variance accounts for the correlation found between the RFMMH and SRHI, we calculated partial correlations between the RFMMH and SRHI, controlling for general preference of the respective media device. There is a decline in correlation strength when partialling out media preference. Still, both coefficients remain significant (zero-order correlation: $r_{computer}$ = .34, p < .001; first-order correlation: $r_{computer}$= .23, p < .001; zero-order correlation: $r_{television}$ = .45, p < .001; first-order correlation: $r_{television}$ = .25, p < .001). Results for frequency of use support the current results as well. No significant correlations are found for context stability.

The second concern touches on the time pressure imposed in our main study. One might argue that results are biased due to the only moderate level of time pressure (7 s): Should the imposed time pressure be too weak and part of the respondents answer deliberately, the measurement is flawed and respondents who took long to answer the RFMMH have to be excluded from further analysis (Klöckner et al., 2003). In order to test

whether the 7-s-criterion produced spurious results, we compare the correlations of the RFMMH and SRHI for respondents with low (m – 1 sd) and high response latencies (m + 1 sd). There are no significant differences between the two groups (Table 2). Again, results for frequency of use and context stability point in the same direction. However, it should be noted that the number of cases is rather low especially for television. Thus, results are tentative.

[Table 2 about here]

Finally, test-retest reliability was satisfactory for computer ($r_{computer}$ = .83, p < .001) and television ($r_{television}$ = .76, p < .001). The RFMMH means did not differ significantly between test and retest ($t_{computer}$ (245) = -1.08, p = .280; $t_{television}$ (183) = 1.59, p = .113). H5 is confirmed.

Discussion

The application of the RFMMH in a field study with a student sample showed that the measure can be adapted to media habits. The original measure of transportation habits was successfully adapted to examine media habit strength. The descriptive statistics of habit strength for computer and television measured by the RFMMH demonstrate adequate distributions of the variables that allow for their use in further analyses. The tests of construct validity prove that the RFMMH indeed measures media habits. The RFMMH correlates significantly with frequency of media behavior. Frequency indicates repetition of a behavior, which is a characteristic of habitual selection and a precondition to building a mental script. The existence of such a script is what the RFMMH points to. Thus, the results add proof to the assumption that the respondents' quickly and non-deliberately chosen answers are the

results of script-based processing. The RFMMH also correlates with the SRHI, which is an established habit measure in social psychology based on self-reports.

The RFMMH correlates with media preferences as well, which is often argued as being a drawback on its validity as a measure for media habits. Whereas the two concepts preferences and media habits are theoretically distinct, it is expectable that they empirically overlap: Habitual behavior is usually in accordance with existing attitudes and preferences. However, the SRHI correlates with general preferences even slightly stronger than the RFMMH. This speaks against a specific bias in the RFMMH measure and points to the connection between the two concepts, which can hardly be separated in survey research. Furthermore, the correlation between the RFMMH and the SRHI maintains significance even when preference for television and computer are controlled for. This confirms that the RFMMH and the SRHI not only measure general attitudes toward the media devices, but also habit strength.

Contrary to expectations, the RFMMH does not correlate with context stability. Stable circumstances were assumed to assist the formation of mental structures, and cues in these circumstances would activate script-based processing. This may indicate that the RFMMH is a weak measure of media habits. However, the RFMMH correlates positively with behavioral frequency and the SRHI, whereas context stability does not correlate with these established measures. Media habits may be a specific case as the selection of media devices is connected to a myriad of potential cues. They are an integral part of people's everyday lives and accompany recipients throughout the day, while other habitually initiated activities such as the use of a seatbelt or brushing one's teeth are limited to very specific contexts. This applies even more in case of mobile media devices such as smartphones and tablets. Therefore, general habits may lack context dependence which is inherent to other habits (LaRose, 2010). Theoretically, this is reflected in the differentiation between the four habit types we propose.

It is likely that context stability is an integral part of specific habits (especially type 1, but also type 3). Researchers need to define the type of habit in which they are interested in order to decide whether context stability is of relevance to their research object. Methodologically, our results challenge the validity of context-related habit measures for general habits (type 2 and 4). The extent to which they are applicable to specific habits (type 1 and 3) needs further exploration.

The relationships between the RFMMH, behavioral frequency, and the SRHI are significant but only moderately high. This does not suggest deficits in either measure, but points to the fact that the measures focus on different aspects and phases of the habit construct. Whereas behavioral frequency concentrates on a precondition for script formation, the SRHI gives a self-report of the perceived automaticity during initiation as well as performance, and the RFMMH implicitly measures script availability, thus habit initiation. Using different measures with certain strengths will provide a comprehensive picture of habitual processing. The RFMMH contributes to that picture as it contributes to measuring habitual initiation of a behavior and covers dimensions of habit that are less conscious and can hardly be retrieved in retrospective and post hoc rationalized self-reports. It eliminates a central critique put forward against habit research as empirical habit studies are often criticized for applying self-reports on unconscious behavior.

Compared to other studies, the reliabilities of the SRHI for television (.80) and especially computer habits (.74) in the current study are lower (e.g., .89 and higher for transportation mode habits, .95 for watching a television series, and .94 for turning on music at home; Verplanken & Orbell, 2003). One reason might be the exclusion of the identity dimension as Cronbach's α is sensitive to the number of items. However, including the identity items only marginally increases Cronbach's α ($\alpha_{television}$ = .84; $\alpha_{computer}$ = .76, not presented above). As the values are still acceptable, we nevertheless regard the SRHI

measurement as sufficiently reliable. Related to this, we find significantly lower correlations between the RFMMH and the SRHI measure for computer habits compared to the initial validation study by Verplanken and Orbell (2003). When taking the identity dimension into account, correlations between the RFMMH and the SRHI (as well as all other validation measures) do not change significantly. Given that the maximum correlation to be expected is .74 (according to Cronbach's α of $SRHI_{computer}$), the correlation of .34 is slightly below what is expected based on Verplanken and Orbell's results. For television, the validation with the SRHI is comparable to the initial results. The higher Cronbach's α may indicate that the SRHI is more applicable to television habit measurement and produces less reliable results for computer habits. This might be due to the fact that the SRHI mingles initiation and performance: Television viewing is a more specific behavior than computer use with which many media activities can be performed. This may make it more demanding for the recipients to consciously assess their general computer habits with focus on the actual performance in the SRHI. We thus suggest that when focusing on general habits (type 2 and 4), as is the case in this study, it might be worthwhile paying closer attention to the RFMMH which is specifically designed to measuring the initiation phase of general habits.

High test-retest reliability furthermore confirms the stability of the measure. Consistency over time is especially relevant for a measure of habits as habitual choice is a stable influence on media use behavior. The RFMMH is able to depict this pattern.

Limitations and Further Steps

The RFMMH explicitly measures the initiation of general habits that lead to the performance of a media behavior in different situations. In the present study the measure indicates that the student respondents automatically chose the computer to satisfy many different needs, whereas the habitual fallback on the television set is limited (see also the SRHI for both devices which points to the same direction). The RFMMH mean for television

is significantly lower than for computer. Additionally, none of the participants selected television to reach all 16 presented goals, whereas the maximum is reached for computer. Nevertheless, the means are considerably lower than the theoretical maximum of 16, indicating that many of the presented goals are not automatically related to one specific media device. This might illustrate that the RFMMH depends on the presented cues. The present study ensured that the items cover potential media gratifications that apply to all media devices. Still, the presented cues might favor electronic media, especially television and computer. Escapism and social gratifications are typically connected to television use (e.g., Rubin, 1984). This might reduce the absolute level of RFMMH realistically attainable for other media devices, for example for newspaper. Whether this is a severe limitation depends on the research interest: With the cues presented in this article the RFMMH is not suitable for intra-individual comparisons of the habit strength of different devices. The interpretation of the absolute level of habit strength for a device is difficult, as shown above when comparing television and computer. The RFMMH allows between-subject comparisons, identifying individuals with different levels of habit strength for the same device and the impact of habit strength on other constructs. Further studies need to examine the influence of the set of situations on the RFMMH results for different media devices.

Strong computer habits (indicated by the RFMMH as well as the SRHI) might be specific for a student sample. Distributions might differ and computer use may be a less extensive habit in a general population sample. It particularly needs to be tested whether the RFMMH can be applied in a representative sample which also includes elderly and less educated participants. As the RFMMH forces quick answers, its applicability with respondents of lower cognitive resources has to be investigated. A different time criterion may have to be applied and more practice or instructions may be needed.

In general, the 7-s-criterion may be too long to ensure script-based processing. The mean response latency was 3.46 s (*sd* = 0.69), indicating that a shorter time limit can be applied. Still, results comparing respondents who took long and respondents who answered quickly indicated no significant differences in the correlations of the RFMMH and the SRHI. Although results are only tentative due to the low number of cases, they indicate that the established time pressure worked and led to script-based processing. Future studies should aim at identifying the ideal amount of time pressure, applying different levels and comparing the results.

Furthermore, the administration of the RFMMH at the beginning of the questionnaire might lead to order effects and influence the subsequent habit measures: By prompting media device selections, the respective scripts may be temporarily easier accessible and therefore produced spurious reports of habit strength. However, we assume that the chosen order produces the least order effects as the RFMMH is an implicit measure compared to the SRHI and behavioral frequency. Still, order effects should be tested in future validation studies by experimentally varying the order of the measurements.

In the present form the applicability of the RFMMH is limited to habits that are triggered by repeated goals and to media device choice that can satisfy a variety of needs. It is possible to translate the RFMMH to general habits cued by external circumstances like place or time by developing a set of external cues and asking for participant's quick choice of a media device. However, the RFMMH solely measures general habits initiating the use of the same media device in several situations (may those be externally or internally instigated) and is not designed to measure specific content habits.

It may be argued that the goal dimensions used as cues in the RFMMH do not actually trigger habits but – on the contrary – habit strength may stipulates the respective goals (see e.g., LaRose, 2010; Wood & Neal, 2007), hinting at the reciprocal relationship between

gratifications (sought) and habits: Whereas, as argued in this paper, goals may trigger habits, goals may also be inferred from habits. If a recipient has a strong habit, the behavioral response (e.g., watching television) is activated irrespective of the provided cues. Correlational analysis cannot identify which direction applies. Still, we do not believe that this reduces the validity of the RFMMH as in both cases (goals triggering habits and inferring goals from habits) strong general habits will result in the selection of the respective media device in many different situations.

Conclusion

The present paper focused on the development and validity testing of the RFMMH. Given the results, the RFMMH appears to be a measure worth considering in future studies on media habits. Further examinations seem worthwhile as the RFMMH may add a valuable instrument to habit research. This applies for two reasons: In contrast to existing self-report measures, this more covert approach to measuring media habits focuses on an important aspect of the concept of habits, which is their script-based instigation. The RFMMH thus provides media researchers with conceptual as well as operational validity. Aside from that, the RFMMH specifically measures general, goal-related media habits. These have been rarely regarded in habit research which has focused on specific habits, cued by external triggers instead of psychological states and leading to specific behaviors like turning towards certain media content. Further research on general habits of selecting one behavior in reaction to several cues or goals seems worthwhile and will help to capture all the facets of the term habit. With this aim the RFMMH could complement the existing habit measures which would jointly provide a more complete picture of the role of habit strength in media use.

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Appendix

RFMMH-Items

Dimension	Item
Entertainment	I want to have fun
	I want to cheer me up
	I want to be excited
	I want to be entertained
Escapism	I'm bored
	I want to pass time
	I want to escape my daily routine
	I have spare time
Media-stimulated interpersonal communication	I'm looking for topics to talk about
	I'm looking for new stimuli
	I'm looking for food for thought
	I want to join in a conversation
Information	I want to be up to date
	I want to get some information
	I want to learn new things
	I'm looking for up-to-date information

Tables

Table 1

Descriptive Statistics for the Measures

Measures	*n*	*m*	*sd*	*mdn*	Min.	Max.	Skew-ness	Kur-tosis	α
Television									
RFMMH	483	2.54	2.21	2.00	0.00	14.00	1.10	2.03	-
Frequency of use	211	8.80	7.04	7.00	0.30	28.00	1.08	0.63	-
SRHI	211	2.34	0.68	2.33	1.00	4.11	0.46	-0.06	.80
Context stability	211	1.73	1.08	2.00	0.00	4.00	0.34	-0.61	-
Computer									
RFMMH	610	7.35	3.62	7.00	0.00	16.00	0.20	-0.39	-
Frequency of use	400	31.31	18.62	28.00	1.00	91.0	0.91	0.26	-
SRHI	400	3.39	0.56	3.39	1.56	5.00	-0.08	-0.04	.74
Context stability	400	1.16	0.98	1.00	0.00	4.00	0.51	-0.45	-

Note. RFMMH = Response-frequency measure of media habit, Frequency of use = average hours/week, SRHI = Self-report index of habit strength (9 items; 1 = *does not apply at all*; 5 = *applies entirely*), Context stability: index computed by counting the number of stable context variables out of four variables

Table 2

Correlations between RFMMH and SRHI, Comparing Fast and Slow Answering Respondents

	Low Response Latency (m – 1 sd)	High Response Latency (m + 1 sd)		
	r	r	Z_f	p
Television	.23 (n = 24)	.25 (n = 30)	0.09	.930
Computer	.25* (n = 70)	.41** (n = 56)	0.98	.328

Note. RFMMH = Response-frequency measure of media habit, SRHI = Self-report index of habit strength (9 items; 1 = *does not apply at all*; 5 = *applies entirely*). * $p < .05$ ** $p < .01$ *** $p < .001$.