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Measuring Media Use and Exposure

Recent Developments and Challenges

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Validating the Response-Frequency Measure of Media Habit

Media habits attract growing attention in communication research (e.g., BAYER/CAMPBELL/LING 2016; HARTMANN/JUNG/VORDERER 2012; LAROSE 2010; RUBIN 1984). Therefore, adequate measures of media habits are needed. A highly valued measure is the self-report habit index (SRHI; VERPLANKEN/ORBELL 2003). However, self-reports which inform about the results of rational self-observation or report past behavior are suspected to lack validity since habitual media use is not performed fully consciously and may therefore not be easily accessible and articulated validly (NISBETT/WILSON 1977). Besides the SRHI, Verplanken and colleagues (VERPLANKEN/AARTS 1999; VERPLANKEN et al. 1998; VERPLANKEN et al. 1994) also developed a response-frequency measure (RFM) of habits. The RFM does not rely on the ability of respondents to identify and report their habitual behavior adequately. By imposing time pressure and measuring the activation of a script – a basic defining characteristic of a habit – the RFM takes an implicit approach to measuring habits. Recently, Naab and Schnauber (2016) adapted the RFM by taking into account the particularities of media use behaviors and created the response-frequency measure of media habit (RFMMH).

Initial research on its validity and reliability indicates that the RFMMH might be a promising measure of media habits (NAAB/SCHNAUBER 2016). The present chapter addresses mainly two desiderata of previous research: First, it aims at replicating construct validity of the RFMMH using another sample and establishing its incremental validity. Second, the chapter examines the applicability of the RFMMH for different population groups including elderly and less educated.

After elaborating on the definition of (media) habits, we review the RFMMH as proposed by Naab and Schnauber (2016) and the central findings of a previous initial study with a student sample on the RFMMH's validity and reliability. In the main part, the desiderata are addressed by a study based on a non-student sample (additionally see SCHNAUBER-STOCKMANN/NAAB, forthcoming). Finally, we discuss our findings critically regarding the value of the RFMMH.

1. Media habits

In communication research, habits have been discussed widely (most prominently by RUBIN 1984). However, theoretical elaborations of the concept are rare. Based on social psychological definitions (e.g., GARDNER 2015; ORBELL/VERPLANKEN 2015; WOOD/RÜNGER 2016), an elaborate understanding of media habits as automatic mental processes has recently been introduced to communication research (e.g., BAYER/CAMPBELL 2012; KOCH 2010; LAROSE 2010; NAAB 2013; SCHNAUBER 2017). In new circumstances, when faced with unknown situations, people need to engage in deliberate thinking on a feasible, appropriate, and supposedly maximally gratifying behavior (e.g., FISHBEIN/AJZEN 2010). In contrast, repeatedly occurring circumstances might be stored in a mental model. This model includes a behavioral response to these circumstances drawn from past successful dealing with the situation. Mental models containing such procedural behavioral information are also called *scripts* (ABELSON 1981). Once the script is triggered, the actor may *automatically* – that is with little cognitive effort, consciousness, awareness, and controllability (e.g., BARGH 1994) – initiate the behavioral response associated with this situation in the script (GARDNER/PHILLIPS/JUDAH 2016). The actor does not thoroughly elaborate on potential behavioral options but repeats past behavior retrieved from the script. The automatically initiated behavioral response stored in a mental script which an actor performs in recurrent, familiar situations is called *habitual behavior* (AARTS/VERPLANKEN/VAN KNIPPENBERG 1998; LAROSE 2010).

When an actor perceives typical attributes of the recurring situation, these so-called *cues* activate the script. External cues triggering media habits are for example place, time, and social surroundings (DANNER/AARTS/VRIES 2008; JI/WOOD 2007; KOCH 2010; VERPLANKEN/WOOD 2006; WOOD/QUINN/KASHY 2002). Furthermore, some habit researchers have emphasized the relevance of

psychological states and goals as internal cues (NAAB/SCHNAUBER 2016; VERPLANKEN/AARTS 1999; for a critique of this view see e.g., WOOD/NEAL 2007).

While the external and internal nature of cues has received some attention in habit research, scholars have only rarely discussed how broad the range of cues is that trigger a respective script. Extant work on scripts in general (ABELSON 1981) and on habits in particular (VERPLANKEN/AARTS 1999) suggests that cues which trigger habits can vary in their scope. During habit formation, it is most probable that a specific situation activates a specific habitual response. However, mental representations might be reorganized and restructured so that a more general script – or meta-script (ABELSON 1981) – develops (AARTS/VERPLANKEN/VAN KIPPENBERG 1998; VERPLANKEN/AARTS 1999; VERPLANKEN et al. 1994, 1998). Formerly separate specific scripts containing similar behavioral sequences are merged into a meta-script (ABELSON 1981). Thus, a larger variety of situational cues are stored in the mental model and can activate the respective behavioral response: »In the case of specific habits, the instigation cues that elicit the habitual response are confined to a well-defined and particular situation [...], whereas general habits are under the control of cues that appear in many different situations« (VERPLANKEN/AARTS 1999: 106). Compared to specific habits, general habits have a broader scope and therefore influence people's everyday lives to a larger extent (VERPLANKEN/AARTS 1999).

Based on the nature and the scope of cues, Naab and Schnauber (2016: 130) differentiate four types of habits: (1) Type 1: specific habits cued by recurring and specific external circumstances (e.g., checking one's smartphone habitually always when coming home), (2) Type 2: general habits cued by a variety of external circumstances (e.g., checking one's smartphone habitually when coming home, when entering the bus, and when going to bed), (3) Type 3: specific habits that depend on a recurring and specific goal (e.g., checking one's smartphone habitually when looking for up-to-date information), and (4) Type 4: general goal-related habits that are triggered by a variety of goals that have all been successfully satisfied by the habitual behavior in the past (e.g., checking one's smartphone habitually when looking for up-to-date information, when searching for entertainment, and when wanting to pass spare time).

Compared to other behaviors often researched for their habitual character (e.g., brushing one's teeth, seatbelt use), media device habits are particularly likely to be general in nature. Media provide a multitude of contents and serve a broad variety of goals (LAROSE 2010; LAROSE/EASTIN

2004; MCQUAIL 1986; PAPACHARISSI/RUBIN 2000; RUBIN 1984). Thus, their use is not confined to a narrow set of situations, and media use might be an adequate reaction in many circumstances and for many goals.

2. Procedure of the response-frequency measure of media habit

The RFMMH is an implicit measure of type 4 ›general goal-related habits‹ that does not rely on memory and self-report of past behavior or self-perceived automatism but on spontaneous associations of goals with a behavioral response.

Participants are presented with a variety of media-related goals (each on a separate page of the questionnaire) in a self-administered online questionnaire.[1] Goal dimensions are derived from literature on goals of media use, including entertainment, escapism, media-stimulated interpersonal communication, and information (e.g., LAROSE/EASTIN 2004; MCQUAIL 1986; PAPACHARISSI/RUBIN 2000). 16 goal dimensions that are potentially applicable to all media devices are included: ›I want to have fun‹, ›I want to cheer myself up‹, ›I want to be excited‹, ›I want to be entertained‹, ›I'm bored‹, ›I want to pass time‹, ›I want to escape my daily routine‹, ›I have spare time‹, ›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‹, ›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‹ (NAAB/SCHNAUBER 2016).

Respondents indicate spontaneously and quickly the media device – television, radio,[2] (printed) newspaper, computer, mobile device – they would choose to reach the respective goal. Thus, the RFMMH measures media device habits. Media device selection is the first step, followed by intra-media selection and reception processes. It thus marks the starting point of any media use episode. Only devices a person uses at least seldom are included as choices in the RFMMH for the respective participant. The order of the media devices is randomized between respondents to prevent

1 Information on programming the RFMMH is available from the authors upon request.
2 These categories relate to ›traditional‹ use via a television or radio set.

sequence effects. Additionally, participants can choose ›I would do something else‹ as the presented situations do not necessarily result in media use.

To enhance the probability of spontaneous answers – presumably the option stored in the script –, the RFMMH imposes time pressure. This method is based on the well-proven assumption that reaction time is related to information processing speed as well as accessibility of objects and behavioral responses (BASSILI/FLETCHER 1991; FAZIO 1990; MAYERL 2013) and that, under circumstances of limited opportunity to elaborate, people rely on habits and related cognitive shortcuts (HOFMANN/VOHS/BAUMEISTER 2012; STRACK/DEUTSCH 2004). A countdown signals the time left to answer the respective item. Naab and Schnauber (2016) determined the amount of time pressure in a comprehensive pretest (N = 61): Most participants gave their answers to each presented goal within 7 seconds (M + 1 SD). This time frame includes the whole process of reading the item and choosing an answer. Therefore, an extremely short time frame (milliseconds) comparable to implicit association tests is not appropriate. When respondents make a choice or do not answer within 7 seconds, the online questionnaire automatically switches to the next goal description.

The RFMMH measures the level of invariance in the choices of a participant over all presented goal situations. Habit strength for a media device is indexed by the number of choices of the respective device across the 16 items. For example, the more often a participant chooses television, the stronger their television habit.

3. Validity and reliability of the response-frequency measure of media habit – requirements and previous results

Convergent validity of the RFMMH may be assessed by examining the relations of the RFMMH (a) to validated measures of habit strength (i.e., self-report habit index and context stability) and (b) to central constructs which are correlated with habit strength (i.e., behavioral frequency; CRONBACH/MEEHL 1955).

In an initial study (*N* = 617, student sample), Naab and Schnauber (2016) tested the validity and test-retest-reliability of the RFMMH for television and computer habits. The results point to the convergent validity of the RFMMH: It correlated significantly with the most widely used habit measure, the *self-report habit index* (SRHI) by Verplanken and Orbell (2003; see also

GARDNER/DE BRUIJN/LALLY 2011; ORBELL/VERPLANKEN 2015; VERPLANKEN/MYRBAKK/RUDI 2005): $r_{television} = .45$, $p < .001$ and $r_{computer} = .34$, $p < .001$. These moderate correlations (COHEN 1988) were expected due to differences immanent in the two measures: First, although the SRHI is validated and widely used, it is questionable whether information on the mental capacity in processing media selection can be estimated and articulated validly in a self-report measure (NISBETT/WILSON 1977). Second, self-reports might be biased by post-hoc rationalizations and social desirability (PAULHUS 2002). The RFMMH serves to circumvent these deficits of rational self-observation. Third, the SRHI does not differentiate between specific and general habits, whereas the RFMMH explicitly focuses on the latter. Nevertheless, the SRHI may serve to construct-validate the RFMMH as both measures tap at the same core construct, habit strength. A more precise measure which focusses on script-based selection and the general, goal-related character of habits that could be used for validation is not known to the authors.

A further well-documented measure of habit strength is *context stability* (e.g., DANNER/AARTS/VRIES 2008; JI/WOOD 2007; NEAL et al. 2012). However, context stability measures only capture specific habits, since they are based on the absolute or relative number of times a behavior is performed in the *same situation*. Consequently, no relation with general habits measured by the RFMMH was found in the initial study ($r_{television} = .08$, $p = .243$; $r_{computer} = .04$, $p = .490$; see also NEWELL 2003; SCHNAUBER 2017; SCHNAUBER/WOLF 2016 for similar results).

Furthermore, the relation of the RFMMH and *behavioral frequency* is informative of convergent validity of the RFMMH. First, habits develop from (successfully) repeated behavior. Thus, repetition of a behavior is a necessary precondition for habit formation (LALLY et al.; LAROSE 2010). Only through frequent use, a media habit is formed. Second, once a habit is established, its automatic activation leads to frequent or regular repetition of the respective behavior. Results from various fields, among them media use, show that habit strength is one of the most important predictors of behavioral frequency (e.g., BAMBERG/AJZEN/SCHMIDT 2003; BAYER/CAMPBELL 2012; HARTMANN/JUNG/VORDERER 2012; NEWELL 2003; SCHNAUBER/WOLF 2016; VERPLANKEN et al. 1994). A valid measure of habit strength should therefore correlate at least moderately (as other variables like intentions contribute to repetition as well) with behavioral frequency. This assumption was supported by the initial study ($r_{television} = .41$, $p < .001$; $r_{computer} = .47$, $p < .001$). Finally, a retest ($N = 247$) showed satisfactory test-retest-reliabilities ($r_{television} = .76$, $p < .001$; $r_{computer} = .83$, $p < .001$).

4. The current research

The promising results on RFMMH's validity and reliability were based on only a student sample. To allow for an externally valid and generalizable judgement of the measurement's quality, further construct validation using samples that are more heterogeneous is needed. Based on a sample representative for German Internet users aged 18 to 69, we therefore aim at establishing (1) convergent validity by comparing the RFMMH with an established measure of habit strength (SRHI[3]) as well as a related construct (use frequency) and (2) incremental validity by comparing the RFMMH to the SRHI in predicting media use frequency. Additionally, we test whether different population groups are well able to complete the RFMMH within the given time frame.

4.1 *Validation of the response-frequency measure of media habit – convergent and incremental validity*

In line with the initial study, this chapter focusses on *convergent validity* by examining the relations of the RFMMH to an already validated measure of habit strength (SRHI) and to behavioral frequency.

H1: The RFMMH correlates positively and moderately with the SRHI.

H2: The RFMMH correlates positively and moderately with use frequency.

The initial study only used retrospective self-reports of use frequency to validate the RFMMH. However, self-reports of behavioral frequency have been subject to criticism because they require the ability and the willingness to retrieve and count all incidents of a target behavior or at least estimate their number properly and report them. Compared to retrospective self-reports in surveys, diary data on media use frequency is assumed to be more reliable since it is less biased by limited memory performance (SUDMAN/BRADBURN/SCHWARZ 1996). Diary data is also expected to be more

3 As shown above, no correlation with context stability as a measure of specific habits is expected. Therefore, the current study did not include context stability.

valid since systematic bias to the disadvantage of less deliberately chosen activities (e.g., supposedly habitual media use) and less regular activities is reduced (KROSNICK 1991; SCHWARZ 2007). Therefore, the current study also used diary-based frequency measures to validate the RFMMH.

Additionally, for the first time we test *incremental validity* – »the degree to which a measure explains or predicts some phenomena of interest relative to other measures« (HAYNES/LENCH 2003: 457). When implementing a new measure (RFMMH) where a well-validated and reliable scale (SRHI) already exists, it is important that the new measure captures the construct of interest (habit strength) at least as accurately as the established one. The most important indicator of incremental validity is a more accurate prediction of central related constructs (use frequency) by the new measure compared to the established one (HAYNES/LENCH 2003). Furthermore, economic considerations like an easier administration may apply if the new measure performs at least as good as the established one.

RQ1: Does the RFMMH predict use frequency better than the SRHI?

4.2 *Applicability of the* RFMMH *to heterogeneous samples*

So far, the RFMMH has only been applied in a student sample, but its feasibility needs specific attention since it imposes time pressure on respondents. The amount of time pressure must be adequate for heterogeneous samples including respondents of lower cognitive resources. Individual characteristics might limit respondents' ability to react fast enough to answer within a time limit.

There is numerous evidence for inter-individual differences in cognitive speed. Cognitive power of the brain, working memory, and processing resources associated with slower processing of information are lower for less educated (as a proxy for intelligence) and decline with age (FAUST 1999; MACPHERSON/PHILLIPS/DELLA SALA 2002; SALTHOUSE/BABCOCK/SHAW 1991; ZELINSKI/BURNIGHT 1997). A result of lower cognitive speed is longer response time (for an overview see FAUST et al. 1999). This raises the question whether the RFMMH is applicable for various socio-demographic groups, especially samples with a broad range of age and educational levels.

The original RFMMH study imposed a time limit of 7 seconds on the respondents. Reaction time was well within the provided time frame

($M = 3.46$ s; $SD = 0.69$; NAAB/SCHNAUBER 2016). This reaction time includes the whole process of reading the item and choosing an answer. As the questionnaire automatically switched to the next page after the time limit, respondents who would have needed more time could not answer an item. Therefore, item non-response within the RFMMH is an additional indicator for individual handling of time pressure. The vast majority of respondents in the initial study (81%) was able to answer all RFMMH items (NAAB/SCHNAUBER 2016). Given the outlined considerations, it seems worthwhile to investigate how respondents of different age and educational levels are able to handle the administration of the RFMMH.

RQ2: Do age and educational level influence reaction time to goal items presented in the RFMMH?

RQ3: Do age and educational level influence the amount of item non-response in the RFMMH?

5. Method

Data from a larger project on the role of habits in media device selection (see SCHNAUBER 2017 for details) serves to test convergent validity by assessing whether the RFMMH correlates adequately with the established habit measure SRHI (H1) and use frequency (H2). Incremental validity is established by comparing the correlations of the RFMMH and the SRHI with use frequency (RQ1). Furthermore, we examine the applicability of the RFMMH in a heterogeneous sample including elderly and less educated respondents in regard to reaction time (RQ2) and completion without item non-response (RQ3).

5.1 *Sample and procedure*

In total, 915 respondents took part in an online survey. Participants were recruited via an online access panel, based on quotas representative for German Internet users aged 18 to 69 (response rate: 39%). After data cleaning, 791 cases were included in the analyses. The sample matched the population well: 51 percent male and 49 percent female, 59 percent low educated and

41 percent highly educated, mean age 43.41 years (SD = 13.18). Of all participants, 347 also successfully completed an online diary.[4] For 14 days, participants reported for each half-hour interval between 4.30 pm and 9.00 pm (nine intervals) whether they used a media device (television, computer, smartphone, tablet, (printed) newspaper, radio). This time frame was selected as it covers most private media use in Germany (ENGEL/BREUNIG 2015). Within this chapter, we focus on television and computer to directly compare the current results to the initial paper (NAAB/SCHNAUBER 2016). Additionally, smartphone use is included as its ubiquitous use options may influence habit strength and instigation. Thus, the inclusion of smartphone habits provides a more complete picture of the RFMMH's validity.

5.2 *Measures*

For each media device, respondents rated their use frequency and then completed the RFMMH and the SRHI. In between, respondents answered unrelated questions to prevent halo effects. Table 1 contains the descriptive statistics of all relevant variables.

The procedure of the RFMMH followed the description of Naab and Schnauber (2016) described above. Response categories were television, radio, (printed) newspaper, computer, tablet, smartphone, and ›I would do something else‹. Habit strength was computed for television, computer, and smartphone by summing up the number of choices of the respective device across the 16 goal dimensions. Thus, habit strength ranges from 0 = *device not chosen in any situation* to 16 = *device chosen in every situation*. Higher values indicate stronger general goal-related habits (type 4).

Respondents answered an adapted version of the SRHI focusing on the automaticity of habitual selection for television, computer, and smartphone on a five-point agreement scale (VERPLANKEN/ORBELL 2003; 11 items, e.g., ›Mostly, I switch on [media device] automatically‹; see also GARDNER 2015). Only respondents who used the respective device at least seldom answered the SRHI. Cronbach's alphas indicate good internal consistencies for all media devices (Table 1).

4 Only participants who completed at least 12 out of 14 days were included in the final analyses.

TABLE 1
Descriptive statistics for all measures

Measures	*N*	*M*	*SD*	*Mdn*	*Min*	*Max*	α
Television							
RFMMH	740	4.21	2.88	4.00	0.00	16.00	
SRHI	740	2.91	0.88	2.91	1.00	5.00	.89
Survey-based use frequency	740	5.16	0.90	5.00	1.00	6.00	
Diary-based use frequency	324	10.09	6.32	10.00	0.00	39.00	
Computer							
RFMMH	770	5.82	3.66	6.00	0.00	16.00	
SRHI	770	3.10	0.73	3.00	1.00	5.00	.83
Survey-based use frequency	770	5.58	0.71	6.00	1.00	6.00	
Diary-based use frequency	340	7.57	6.18	7.00	0.00	39.00	
Smartphone							
RFMMH	618	1.89	2.79	1.00	0.00	16.00	
SRHI	618	3.04	1.03	3.00	1.00	5.00	.93
Survey-based use frequency	618	5.55	0.88	6.00	1.00	6.00	
Diary-based use frequency	259	8.92	11.54	6.00	0.00	90.00	

Note. RFMMH = Response-frequency measure of media habit: 0 = *device not chosen in any situation/low habit stength* to 16 = *device chosen in every situation/high habit strength*; survey-based use frequency: 1 = *never*, 6 = *several times a day*; diary-based use frequency: number of media use episodes reported in the diary; SRHi = Self-report habit index (11 items; 1 = *low habit strength*, 5 = *high habit strength*).

Respondents assessed their *use frequency* on a retrospective self-report scale from 1 = *never* to 6 = *several times a day*. Additionally, we constructed an alternative score of use frequency based on the diary data. Within each half-hour interval, participants indicated if they had started or continued using a media device. Total use frequency for each device within the diary period was calculated by summing up all intervals in which media use was started. A value of 14 for instance indicates that a participant switched on television 14 times within the diary period. Whether this respondent watched continuously for the next four hours or just for five minutes is not captured by this measure of use frequency. This conforms to the definition of habit in this chapter: The initiation, thus the selection, may be triggered automatically and therefore be influenced by habit strength, not the duration of the following habit performance.

As *socio-demographic* measures, respondents' sex, age, and education level (low education = *Volks-/Hauptschule, Realschule [less than 12 years of school]*; high = *(Fach-)Abitur [12 years of school or more]*) were assessed.

6. Results

6.1 *Relation with the* SRHI *and use frequency*

For all media devices, habit strength measured by the RFMMH correlated[5] significantly with the SRHI ($r_{television}$ = .30, 95% CI [.19, .41]; $r_{computer}$ = .13, 95% CI [.01, .24]; $r_{smartphone}$ = .40, 95% CI [.31, .49]), with survey-based use frequency ($r_{television}$ = .38, 95% CI [.29, .48]; $r_{computer}$ = .29, 95% CI [.20, .38]; $r_{smartphone}$ = .28, 95% CI [.23, .33]), and with diary-based use frequency ($r_{television}$ = .35, 95% CI [.24, .44]; $r_{computer}$ = .31, 95% CI [.20, .41]; $r_{smartphone}$ = .30, 95% CI [.18, .44]). Correlations were – as expected – moderate (COHEN 1988) with one exception: For computer, the RFMMH and the SRHI correlated only weakly. Overall, H1 and H2 were supported, indicating convergent validity of the RFMMH – particularly for television and smartphone.

To assess incremental validity (RQ1), we compared correlations with use frequency between the SRHI and the RFMMH to assess the unique relation between the two habit measures and use frequency. The SRHI correlated significantly stronger with *survey-based use frequency* for television (SRHI: r = .54, 95% CI [.46, .62]; z = -2.89, p = .002) and smartphone (SRHI: r = .42, 95% CI [.33, .50]; z = -2.18, p = .015) than the RFMMH. For computer (SRHI: r = .26, 95% CI [.17, .36]; z = 0.46, p = 0.323), both measures performed equally well. Compared to the SRHI, the RFMMH correlated significantly stronger with *diary-based use frequency* for television (SRHI: r = .16, 95% CI [.04, .26]; z = 3.05, p = .001) and computer (SRHI: r = .15, 95% CI [.05, .25]; z = 2.35, p = .009). For smartphone (SRHI: r = .33, 95% CI [.25, .43]; z = -0.47, p = .319), there was no significant difference.

5 As the variables were not normally distributed, bootstrapping was applied. Bootstrap standard errors and bias-corrected 95 percent confidence intervals were generated based on 1,000 bootstrap samples.

6.2 *Reaction Time*

On average, respondents took 3.68 s ($SD = 0.91$) to answer an RFMMH item. Thus, the reaction time was well within the provided time frame of 7 s. To test whether different age and education groups differ in their reaction times (RQ2), we conducted a multiple regression (dependent variable: reaction time; independent variables: education level (0 = low) and age). None of the predictors significantly explained reaction time ($b_{education} = 0.01$; $t = 0.16$; $p = .876$; $b_{age} = 0.00$; $t = 0.35$; $p = .725$) nor was the model itself significant ($R^2 = .00$; $F(2/786) = 0.07$; $p = .932$, $N = 791$). Elderly or less educated respondents thus did not take longer to complete the RFMMH compared to younger or highly educated participants.

6.3 *Item non-response*

77 percent of the respondents answered all RFMMH situations, and only 1 percent answered less than two thirds of the 16 items. On average, less than one (out of 16) items was not answered. The results indicate that there were no substantial problems when completing the RFMMH. To test whether specific socio-demographic groups differ in their ability to complete the RFMMH (RQ3), we conducted a logistic regression[6] (dependent variable: 0 = no item non-response, 1 = at least one item not answered; independent variables: education level (0 = low) and age; Nagelkerke's $R^2 = .03$; $\chi^2(2) = 15.24$, $p < .001$; $N = 791$). Age was the only significant predictor: Older respondents tended to produce item non-response more frequently; however, the effect size was small (Exp(B) = 1.03, $W = 14.59$; $p < .001$). Education level did not predict item non-response (Exp(B) = 1.13, $W = 0.50$; $p = .478$).

7. Discussion

The role of habit strength in media selection receives growing attention in communication research. Various studies have shown that habits are

6 Due to the distribution of the number of the items not answered – 77 percent of the respondents answered all items – a linear regression model did not fit the data.

an important predictor of different media activities. Therefore, valid and economic measures of habit strength applicable to samples with different levels of cognitive ability are needed. Recently, Naab and Schnauber (2016) introduced the response-frequency measure of media habit (RFMMH) to communication research.

The results of the current study largely point to convergent validity of the RFMMH in a heterogeneous sample: As hypothesized, the RFMMH correlated moderately with use frequency for all media devices. Furthermore, the RFMMH correlated moderately with the SRHI for two out of three devices. Unlike in the initial study, correlations between the two measures were, however, rather low for computer habits. This may result from at least two reasons: First, the SRHI may not capture computer habits adequately. However, the SRHI is widely used and validated for various behaviors. Therefore, this explanation seems less likely. Second, the RFMMH may not be a valid measure of computer habit strength. Computers, especially because their use is strongly tied to Internet use, can be used universally, serving a very broad range of goals. This might make the computer very suitable for general habits following the above conception. This is also shown be the high absolute level of the RFMMH for computer ($M = 5.82$, $SD = 3.66$). However, the mere fact that a device can be used for many purposes does not necessarily imply that its use is always triggered automatically. As the initial (NAAB/SCHNAUBER 2016) as well as further studies (SCHNAUBER-STOCKMANN/NAAB, forthcoming) speak in favor of the RFMMH's validity for measuring computer/Internet habit strength, future research is needed to clarify this issue.

With respect to incremental validity, comparing the established SRHI and the RFMMH in their predictive power of retrospectively self-reported use frequency showed no advantage of the RFMMH. On first glance, this might suggest that the RFMMH is at best as successful as the SRHI in measuring habit strength. However, there may be a bias due to common method variance (BAUMGARTNER/STEENKAMP 2001): Respondents who tend to agree in surveys may choose higher values for the SRHI as well as for use frequency. The RFMMH, however, does not rely on comparable scales. Self-reports on consciousness and frequency may suffer from the same challenges of reliable retrieval and articulation. This argument is strengthened by the result that the RFMMH performed significantly better for two out of three media devices when use frequency was measured diary-based. This speaks for the incremental validity of the RFMMH, as the diary-based measure is less prone

to biases compared to self-reported use frequency (SUDMAN/BRADBURN/SCHWARZ 1996).

The administration of the RFMMH worked well for a heterogeneous sample, although there were slight differences in the ease of completing the RFMMH. Older respondents tended to have more difficulties as indicated by the higher probability of item non-response, but they were still well able to complete the RFMMH and did not need more time. A lower education level did not influence the ability to complete the RFMMH and did not result in slower handling. However, as a limitation, it has to be kept in mind that participants were recruited via an online access panel. Individuals registered in online access panels differ from the general population in their computer affinity and computer skills. These may be related to the time needed to complete the RFMMH. To finally decide on the feasibility of the RFMMH, a sample without this potentially biased skill level is needed. Nevertheless, the RFMMH is a self-administered online measure. Thus, basic computer skills are required for completion. Therefore, the current results strongly suggest that the RFMMH is applicable to heterogeneous samples.

In conclusion, the current study has taken a further step towards validating the RFMMH and – keeping the potential limited validity for computer habits in mind – indicates that it is a measure worth considering in a broad range of audience studies referring to media selection. In contrast to existing self-report measures, the RFMMH focuses on automatic script-based initiation of a behavior, which is the core of the habit construct. Furthermore, the application of the RFMMH is economic. Its administration proceeds fast: Whereas the SRHI has to be repeated for each (media use) behavior of interest, the RFMMH is only administered once. Additionally, it differs from common psychological scale measures. This might be beneficial to the perception of a survey by the respondents as being rich in variety. Thus, the RFMMH can complement existing habit measures and jointly provide a more complete picture of the role of habit strength in media use. Complementing self-report measures of habit strength focusing on perceived repetition, lack of awareness, and controllability in performing a behavior, the RFMMH contributes a measure of script-based activation.

Habits are important constructs in communication research, for example as determinants of media use (PETERS 2007), procrastination (SCHNAUBER-STOCKMANN/MEIER/REINECKE 2018), and audience activity (BAYER/CAMPBELL 2012; BAYER et al. 2016), but also for media practitioners

(EASTMAN/FERGUSON 2002). Valid measurement therefore lays ground to relevant studies in these fields.

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