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Specific Situations or Specific People? How Do Extrinsic and Intrinsic Factors Interact in Cultivation Research?

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Based on the rationale of dual process models, processing strategies influence the cultivation of first-order beliefs. Dual process models predict two key prerequisites for processing systematically: motivation and ability, which in turn can be influenced by intrinsic as well as extrinsic factors. Yet most research has concentrated on extrinsic factors by varying characteristics of the situation. The interaction between intrinsic and extrinsic characteristics, however, has not been researched to date. We present a field study testing for this kind of interaction. Results of a general population study indicate that intrinsic (education) as well as extrinsic (survey mode) factors moderate cultivation. Additionally, we found a person-situation interaction, indicating that cultivation is influenced by extrinsic factors in different ways, depending on an individual's intrinsic characteristics.

Keywords: cultivation, heuristic processing, information processing, media bias perceptions, media effects

Cultivation analysis investigates how television shapes viewers' conceptions and judgments of social reality. The idea that television serves as a symbolic environment and a medium of socialization was first formulated by George Gerbner (1969). In essence, the cultivation hypothesis states that the more people watch television, the more they tend to form social judgments in line with the messages of the world portrayed on television instead of actual reality (Morgan & Shanahan, 2010). For instance, as television presents many violent messages, heavy television viewers may believe that the world is more violent and dangerous than it actually is.

In recent decades, some cultivation researchers have focused on mental processing strategies to explain cultivation (Bradley, 2007; Busselle, 2001; Busselle & Shrum, 2003; Hawkins & Pingree, 1980; Potter, 1991; Schroeder, 2005; Shapiro & Lang, 1991; Shrum & O'Guinn, 1993). One major line of research deals with heuristic and systematic processing and their influence on cultivation judgments. Cultivation of first-order judgments is assumed to be stronger when processing heuristically and can be diminished when processing systematically.

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In everyday life, heuristic processing is the default mode. People change their processing strategy only when they are motivated and able to do so (as specified in various dual process models; for a review, see Smith & DeCoster, 2000). Motivation and ability, in turn, may stem from two different sources: Intrinsic motivation and ability are stable characteristics of a person. Extrinsic motivation and ability are factors influenced by characteristics of the situation. In this article, we analyze the role of intrinsic and extrinsic characteristics related to motivation and ability in cultivation of first-order judgments. We endeavor to contribute to the understanding of how these factors interact if neither of them is kept stable in a laboratory situation.

Cultivation Analysis

The cultivation hypothesis states that "those who spend more time watching television are more likely to perceive the real world in ways that reflect the most common and recurrent messages of the world of fictional television" (Morgan & Shanahan, 2010, p. 337). Cultivation analysis investigates this biased perception via surveys. In these analyses, television viewing is the independent variable and judgments about social reality are the dependent variables.

When assessing television viewing, researchers must decide whether to focus on specific genres or overall exposure. For this decision, the topic under investigation is of relevance. When dealing with specific topics (e.g., the representation of occupations such as scientists and doctors as well as topics such as sexual stereotypes and mental illnesses), cultivation may stem from genres that cover the topic of investigation more than average.

In this study, we focus on perceptions of crime. There are indicators that overall television viewing may be the better independent measure in this case: Compared to other topics, crime and violence are consistently overrepresented in different genres on television (Diefenbach & West, 2001; Gerbner, 1969; Krüger, 2011a, 2011b; Schramm, Lyle, & Parker, 1961), speaking for a metamessage of television as a whole and not specific genres. Yet there is an ongoing discussion about whether genre-specific measures or overall television viewing better predict cultivation; there are also opposing results that demonstrate the existence of (stronger) cultivation for genre viewing (Custers & van den Bulck, 2013; Eschholz, Chiricos, & Gertz, 2003; Heath & Petraitis, 1987; Weitzer & Kubrin, 2004). Although many cultivation studies only consider exposure to specific genres or program types, the focus on overall viewing is more in line with Gerbner's and his colleagues' original thinking. Morgan and Shanahan (2010) argue that "people (especially heavy viewers) do not watch isolated genres only, and that any 'impact' of individual program types should be considered in the context of overall viewing experience" (p. 341). Therefore, we focus on overall television viewing.

The dependent variables in the analysis are viewers' reality judgments. Based on a distinction introduced by Hawkins and Pingree (1982), Gerbner, Gross, Morgan, and Signorielli (1986) differentiate between two types of cultivation measures: First-order cultivation judgments refer to frequency or probability estimates—for example, the percentage of police officers in the total workforce, the proportion of marriages that end in divorce, and the number of annual cases of cosmetic surgery, all of which are overrepresented on television (see Diefenbach & West, 2001; Rossmann & Brosius, 2005; Shrum, 1996).

Second-order cultivation judgments deal with values and belief systems. The most prominent example is the "mean world" syndrome, whereby heavy television viewers perceive the world as a mean and dangerous place (Gerbner, Gross, Morgan, & Signorielli, 1994). The original idea was that values and beliefs (second-order cultivation) result from the biased representation of demographic facts (first-order cultivation). This relation, however, has never been clearly demonstrated empirically (e.g., Hawkins, Pingree, & Adler, 1987). For this reason, Gerbner and colleagues did not adhere to this distinction. Yet many other researchers still refer to it. The distinction between the two types has become common, but the question of their causal order has not received much attention (Morgan, Shanahan, & Signorielli, 2012).

For one specific area of cultivation research, the distinction between first- and second-order cultivation measures is central, irrespective of their originally implied sequence of occurrence: using cognitive processes to explain the occurrence of cultivation (Bradley, 2007; Busselle, 2001; Busselle & Shrum, 2003; Schroeder, 2005; Shapiro & Lang, 1991; Shrum & O'Guinn, 1993). It is assumed that these processes differ between first- and second-order cultivation judgments (Shrum, 2004; Shrum & Lee, 2012). In this study, we focus on first-order cultivation judgments. Previous research indicates that heuristic processing leads to biased first-order cultivation judgments (Shrum, 1996, 2001, 2004). In the next section, we explicate the model in greater detail.

The Heuristic Processing Model of Cultivation

Shrum's work specifically applies social cognition models to cultivation (Shrum, 1995, 2001, 2004; Shrum & Lee, 2012). The principles of Shrum's approach are based on the logic of dual process models. They claim that, in general, people process information in two ways: via heuristic processing, which uses only a few cognitive resources, and systematic processing, which uses more cognitive resources (Smith & DeCoster, 2000). Communication researchers mostly refer to the elaboration likelihood model by Petty and Cacioppo (1986) and the heuristic-systematic model by Chaiken, Liberman, and Eagly (1987). Although these models are not completely congruent, they are based on the same key prerequisites: To process systematically (or, in terms of the elaboration likelihood model, to use the central route), individuals must be both motivated and able to do so. Otherwise, they will form their judgment heuristically (O'Guinn & Shrum, 1997; Shrum, 1996; Shrum & O'Guinn, 1993; Shrum, Wyer, & O'Guinn, 1998; Wyer & Srull, 1989). Heuristic and systematic processing is (at least in the elaboration likelihood model) construed as a continuum, allowing for varying levels of processing depth (Petty & Brinol, 2012; Petty & Wegener, 1999; see also Kruglanski, Thompson, & Spiegel, 1999).

Applied to cultivation, it is reasoned that cultivation of first-order judgments occurs mainly when a person is processing heuristically (Shrum, 1996, 2001; Shrum, et al., 1998). This can be explained by the availability heuristic, which states that people recall examples that are most accessible in their memory when making reality estimations (Busselle & Shrum, 2003; Roskos-Ewoldsen, 1996; Roskos-Ewoldsen, Roskos-Ewoldsen, & Dillman Carpentier, 2002; Schroeder, 2005; Tversky & Kahneman, 1973). Heavy television viewing makes relevant examples more accessible. This is supported by findings that heavy television viewers show faster response latencies when giving first-order cultivation judgments (Shrum & O'Guinn, 1993) and that the ease of retrieving examples often portrayed on television is related

to hours of television viewing (Busselle & Shrum, 2003). Conversely, if people's attention is drawn to television, this should lead to source discounting and, therefore, diminished cultivation of first-order judgments (Shrum et al., 1998). The same idea applies when individuals are motivated to process systematically. If individuals process systematically, they show less—or even "reversed"—cultivation of first-order judgments (Shrum, 2001). In our analysis of the different influences on motivation and ability occurring in cultivation analysis, we distinguish between two different sources of ability and motivation: Intrinsic characteristics are inherent to the person and thus stable. Factors outside of the individual that originate in the (survey) situation are extrinsic characteristics.

Intrinsic Characteristics

When examining processing strategies, a person's motivation and ability must be analyzed. In this article, we associate motivation with need for cognition (NFC), and we associate ability with education. Although motivation and ability are presented separately in this section, it should be kept in mind that they might be confounded (Cacioppo & Petty, 1982). Nonetheless, evidence exists that NFC functions as an autonomous concept from intrinsic ability (Fleischhauer, Enge, Brocke, Ullrich, & Strobel, 2009). Moreover, we do not aim to compare the influence of ability and motivation; rather, we focus on the interaction of extrinsic and intrinsic factors. The contribution of motivation and ability in the first step helps illustrate the different intrinsic characteristics that influence processing strategy (and thus cultivation) in interaction with extrinsic characteristics.

Motivation to Process

The intrinsic motivation to process may be best assessed with the need for cognition concept. NFC describes the extent to which people enjoy engaging in a cognitive activity (Cacioppo & Petty, 1982; Petty & Cacioppo, 1986) and deal with tasks and social information (Cacioppo, Petty, & Kao, 1984). People with a high NFC tend to process systematically, whereas those with a low NFC tend to favor heuristic processing (Haugtvedt, Petty, & Cacioppo, 1992; Haugtvedt & Petty, 1992).

H1: Need for cognition moderates cultivation: Higher levels of need for cognition lead to lower cultivation.

Ability to Process

Two variables of a message recipient have been investigated in persuasion research: general intelligence and educational level (McGuire, 1969). It has been suggested that the greater a recipient's general intelligence or education, the greater their ability to process systematically (Hawkins & Pingree, 1982; Petty & Cacioppo, 1986). Education has been found to moderate cultivation in the manner that higher education leads to diminished cultivation (Morgan & Shanahan, 1997).

H2: Education moderates cultivation: Higher education leads to lower cultivation.

Extrinsic Characteristics

Several survey situation characteristics may extrinsically influence a person's processing strategy. Similar to the person's characteristics, the characteristics of the survey situation cannot be clearly distinguished with respect to motivation and ability. Extrinsic factors can influence both at the same time. Yet again, as we focus on a person-situation interaction rather than comparing the influences of motivation and ability, this confounding does not affect the analysis. Two major situational factors that influence processing strategies during a survey situation are applied in this study: the questionnaire instructions and the mode of the survey.

Questionnaire Instructions

A manipulation of how questions are posed can lead to different processing strategies. For instance, Shrum (2001) motivated student participants to process systematically by using an accuracy motivation/task importance manipulation (Chaiken, 1980): Students were instructed to answer as accurately as possible, and they were told that the results would be discussed afterward and "graded" by the experimenter. In the heuristic processing condition, participants were asked to answer spontaneously, "off the top of their heads," and "give the first answer that occurs." Participants in the controlled condition did not receive any instructions. Task importance has been shown to enhance systematic processing and thus reduce cultivation (see also Chaiken et al., 1987).

H3: *Questionnaire instructions moderate cultivation: Participants in the systematic condition show less cultivation compared to those in the heuristic condition.*

Survey Mode

The basic assumption of Shrum's (2001) process model is that first-order cultivation judgments are formed at the moment when the cultivation question is asked. Accordingly, the situation and the mode in which someone is surveyed can influence the processing strategy and thus the occurrence of cultivation (Shrum, 2007). First, the presence of an interviewer may have an impact on whether a person processes systematically or heuristically. Interviewers motivate respondents to (cognitively) engage in the interview (Dykema, Basson, & Schaeffer, 2008). Furthermore, the presence of an interviewer places social pressure on respondents, which may result in a higher motivation to give the correct answer, because respondents do not want to embarrass themselves in front of another person (Tourangeau, Rips, & Rasinski, 2000). In face-to-face and telephone surveys, interviewers are involved. Yet, because the interviewer is not physically present in telephone survey situations, their perseverance is nonbinding, leading to less confidence and therefore less cooperation and motivation among participants to engage with the questions compared to face-to-face interviews (Holbrook, Green, & Krosnick, 2003). In contrast, in self-administered interviews, no interviewer is involved; thus, an important source of motivation to process systematically is absent.

Second, the interview pace may influence the processing strategy. Shrum, O'Guinn, Semenik, and Faber (1991) found that response speed influences cultivation. To avoid awkward silences, telephone

interviews are generally shorter (Holbrook et al., 2003; Körmendi, 1988; Skykes & Collins, 1987), and responses are given more quickly (Groves & Kahn, 1979) than they are during face-to-face interviews. Therefore, particularly easily accessible information is used to answer questions (Lamp, Maurer, & Zerback, 2007). In self-administered surveys, respondents answer at their own pace, they can reread questions, and they are under no time pressure (Bishop, Hippler, Schwarz, & Strack, 2001; Dillman, & Parsons, 2008; Tourangeau et al., 2000), allowing for systematic processing.

Shrum (2007) cites unreported data from Morgan and Shanahan showing small but significant differences in the size of cultivation as a function of the survey mode. Cultivation was greatest when measured in telephone surveys and smallest when measured in face-to-face interviews, with self-administration falling in between. This is consistent with the arguments presented above as well as the findings by Shrum (2007). He tested the heuristic processing model by manipulating the survey mode—telephone and self-administered interviews—within a general population sample.

H4: *Survey mode moderates cultivation: Telephone interviews lead to the highest cultivation and face-to-face interviews to the lowest cultivation. Self-administrated interviews fall in between*.

Person-Situation Interactions in the Cultivation Process

The four hypotheses presented above state how intrinsic and extrinsic factors are expected to moderate cultivation. Yet those are only two-way interactions between the respective intrinsic or extrinsic factors and television on the cultivation judgment. In the next step, we examine the interaction between intrinsic and extrinsic factors (for a thorough discussion on person-situation interactions, see, e.g., Sorrentino, 2013).

Shrum (2001) found that actively manipulating the questionnaire instructions so that people tended to process heuristically or systematically led to more cultivation in the heuristic condition. However, this was only tested with a student sample, which is homogeneous and favorable toward systematic processing (Cacioppo & Petty, 1982; Haugtvedt & Petty, 1992; Haugtvedt et al., 1992; Petty & Cacioppo, 1986). Shrum (2007) also tested for different survey methods fostering or deflating cultivation on a representative sample but he did not actively manipulate the questionnaire instructions. In both studies, Shrum found that forcing people to process systematically deflates cultivation, whereas heuristic processing promotes cultivation. However, Shrum did not combine the situational manipulations with heterogeneous personal characteristics, testing for their interaction. In this study, we combine Shrum's 2001 and 2007 studies: We actively manipulate the extrinsic factors of questionnaire instructions (Shrum, 2001) and survey mode (Shrum, 2007) on a general population sample. This sample is more heterogeneous than Shrum's 2001 student sample and thus allows testing the interaction with the intrinsic factors of education and the need for cognition in combination with extrinsic factors.

When considering a possible interaction of extrinsic and intrinsic factors and their influence on the level of systematic processing, two outcomes are possible: First, favorable extrinsic factors could become *especially effective* when they are in line or congruent with intrinsic factors (i.e., a highly motivated and able person being confronted with the systematic questionnaire instructions and/or a survey mode

fostering systematic processing; see the concept of synergistic interaction—e.g., Schmitt & Sabbagh, 2004). The favorable preconditions of individuals with high NFC and/or education allow for an easier shift toward higher levels of systematic processing. This means that we should find diminished cultivation especially among people with high NFC and/or education when meeting the extrinsic factors (systematic condition in the questionnaire instructions and face-to-face interview mode). Conversely, for people with lower levels of NFC and/or education, the hurdle to systematic processing is higher, because more shortcomings have to be compensated for. On the continuum from heuristic to systematic processing, it is more demanding and thus less likely people with lower NFC to pass a certain threshold needed to reduce cultivation. Therefore, they should still show higher cultivation even when the respective extrinsic factors are met.

The second possibility is that those with favorable intrinsic preconditions (high NFC and/or education) by default show higher levels of systematic processing (Petty & Cacioppo, 1986). Thus, extrinsic factors *may lose their effectiveness* due to a ceiling effect (ceiling effects for individuals high in NFC have been detected; see, e.g., Priester & Petty, 1995, experiment 2). A shift toward even more systematic processing is less likely for them. In this case, participants with higher NFC and/or education should react less to extrinsic factors, fostering systematic processing (systematic condition in the questionnaire instructions and face-to-face interview mode), because they cannot effectively reduce cultivation. Those with lower NFC, however, should shift from heuristic to systematic processing when meeting the respective extrinsic factors. Because the interaction between intrinsic and extrinsic factors remains unclear and allows for different possible outcomes, we ask:

RQ1: How do extrinsic and intrinsic factors interact with respect to cultivation? Do participants with different levels of need for cognition and education react to extrinsic factors in different ways?

Method and Data

Design

A general population survey with 824 participants was conducted in three modes: via telephone (computer-assisted telephone interview [CATI]; n = 345), face-to-face (n = 350), and self-administered (n = 129). Undergraduate communication research students conducted the CATI and face-to-face interviews and distributed and collected the questionnaires for self-administered interviews. The CATI sampling frame was based on a random-last-digit design adapted for Germany (Gabler, Häder, & Hoffmeyer-Zlotnik, 1998). Within a household, participants were selected via the last-birthday method. The response rate was 12%. Quota sampling was used for face-to-face and self-administered interviews. Quotas on age, gender, and occupation status were based on census data for the German population (Statistisches Bundesamt, 2009). Interviews were mainly conducted in the Rhineland-Palatinate area in Germany. Due to financial and logistical restrictions (the interviews were conducted by students within survey research courses), it was impossible to randomly assign participants to any of the three conditions. This reduces the internal validity of our research design and may limit the comparability between the three modes and, thus, results pertaining to their mediating role in cultivation. However, the three modes of data collection are still comparable to one another: No significant differences exist between the three

modes in terms of sociodemographics and NFC (see Table 1). Differences between the modes can hence be attributed to the mode and not to structural differences in the samples. Additionally, because participants could not choose which mode they preferred, there is no self-selection bias concerning the survey mode in our data. This procedure is in line with studies comparing survey modes in various research areas (e.g., Ansolabehere & Schaffner, 2014; Groves, 1978).

Thirteen cases were excluded due to missing values for the decisive variables (television viewing, first-order cultivation judgments, education, and NFC). We also excluded participants who recognized the purpose of the study: Participants were asked about their opinion on the topic or aim of the study in an open-ended question following the questions on their television viewing. An answer was assessed as correct if a participant stated that television viewing influenced people's perceptions of crime. In total, 135 participants recognized the purpose of the study (70 in the face-to-face condition, 40 in the CATI condition, and 25 in the self-administered condition). Because it is unclear at which point of the interview they recognized the aim of the study, and therefore whether they tailored their answers accordingly, we took the conservative approach and dropped these participants from further analyses. Thus, 676 cases were included in the subsequent analyses.

Table 1 shows the sample composition for the three modes and the total survey compared to the actual distribution in the German population. Gender and age follow the population parameters quite well. Even the distribution of the CATI sample (which was not based on quotas) is similar to the German population—although slightly younger. There is a clear bias toward higher education compared to the actual distribution. This holds true for all three modes and is a common phenomenon in survey research (Groves, 1989; Keeter, Kennedy, Dimock, Best, & Craighill, 2006; van Goor & Rispens, 2004). Consequently, the representativeness is limited. Nevertheless, our main focus is to investigate relationships between variables and not to estimate their proportion within the population.

Dependent Measure: First-Order Cultivation Judgments

Crime perception was chosen as the questionnaire's topic, because this area is well researched and established measures are available (Bilandzic, 2002; Gerbner & Gross, 1976a, 1976b; Hawkins & Pingree, 1980). Questions measuring first-order cultivation judgments were taken from earlier cultivation studies: the percentage of police officers (Bilandzic, 2002; Bonfadelli, 1983; Cohen & Weimann, 2000; Gerbner & Gross, 1976a), criminal offenses involving weapons (similar to Gross & Aday, 2003; Hawkins & Pingree, 1980, Nabi & Sullivan, 2001), the percentage of bodies on which an autopsy is performed (Meltzer, Naab, & Daschmann 2012), and violent crimes in Germany (Cohen & Weimann, 2000; Hawkins et al., 1987). These four questions were measured on scales ranging from 0% to 50% to allow intuitive estimations, while giving the participants a hint of the range in which the correct answer lies (Daschmann, 2001; Rossmann, 2008). A composite index of the four indicators was conducted ($\alpha = .70$), which serves as dependent measurement for the subsequent analyses and will hereinafter be referred to as the cultivation index.

Table 1. Characteristics of the Sample Compared to the General Population.

Characteristic	Face-to-face interviews (*n* = 279)	Computer-assisted telephone interviews (*n* = 299)	Self-administered interviews (*n* = 98)	Total (*N* = 676)	German population
Gender					
Male	45	46	48	64	49
Female	55	54	52	54	51
Age					
18–29	14	19	14	18	17
30–59	50	53	54	25	52
60 or older	36	28	32	30	31
Education level					
Low[a]	54	53	59	54	78
High[b]	46	47	41	46	22
Need for cognition (*M* and *SD*)	3.6 (0.8)	3.8 (0.8)	3.7 (0.8)	3.7 (0.8)	

Note. Gender: $\chi^2(2) = 0.23$, $p = .892$; age: $\chi^2(4) = 7.53$, $p = .082$; education level: $\chi^2(2) = 1.20$, $p = .548$; need for cognition: $F(2, 673) = 3.82$, $p = .092$ for the comparison of the three modes of data collection. Sums that are higher or lower than 100% are rounding errors. Source for population parameters is Statistisches Bundesamt (2009).

[a] *Haupt-/Volksschule* and *Mittlere Reife*, comparable to middle school.

[b] *Fachabitur* and *Abitur*, comparable to high school.

Independent Measure: Television Viewing

Participants estimated their average television viewing in hours per day separately for weekdays and the weekend. The two estimates were combined to one score ($(hours_{weekdays} \times 5 + hours_{weekend} \times 2)/7$) indicating the hours of regular television viewing per day (Potter & Chang, 1990). On average, participants watch 2.8 (*SD* = 1.5) hours per day.

Moderating Variables

Intrinsic Characteristics

Motivation was measured with a short German version of the NFC scale (Bless, Wänke, Bohner, Fellhauer, & Schwarz, 1994). Alpha coefficient was .60 (four items). Thus, internal consistency is rather low. Although lower levels of alpha coefficients are generally acceptable for scales based on only a few items (Cortina, 1993), the low Cronbach's α of the NFC scale affects any relationship with other variables, resulting in an underestimation of their relation (Schmitt, 1996). Therefore, results in this article concerning the role of need for cognition in cultivation must be treated with caution. *Ability* was operationalized by participants' *education level*, measured categorically by the German types of school diplomas: Participants rated themselves to one of four education levels. Two groups were formed according to this already-achieved or intended (for those who were still in school, *n* = 7) formal education status: low education (*n* = 367) includes *Haupt-/Volksschule* and *Mittlere Reife* (similar to middle school), and high education (*n* = 309) includes *Fachabitur* and *Abitur* (similar to high school).

Extrinsic Characteristics

First**,** the *mode of data collection* was varied: Interviews were conducted face-to-face, by telephone or were self-administered. Furthermore, within each mode, a spilt-ballot experiment was included, which manipulated the *questionnaire instructions*: The introductory comment, as well as a reminder before each cultivation question in the *heuristic condition*, requested the participant to "guess," to answer "spontaneously," or to give "the first answer that occurs." In the *systematic condition*, participants were asked for an elaborate answer ("Please take your time and think about it" and "If you think about it carefully, what would you say?"). Participants were randomly assigned to the two experimental conditions. Randomization was successful (gender: $\chi^2(1) = 0.02$, $p = .877$; age: $F(1, 671) = 2.27$, $p = .132$; education: $\chi^2(1) = 0.15$; $p = .699$; NFC: $F(1, 674) = 1.53$, $p = .136$).

Sociodemographics

In addition to education, we assessed participants' ages and genders.

Treatment Check

Two items served as treatment checks of the experimental variation of the questionnaire instructions ("It was difficult for me to give the right answer" and "It was important to me to give the right answer"); assessed on a five-point agreement scale (Shrum, 2001). The systematic group reported that it was more difficult for them to give the right answer ($M = 2.3$, $SD = 1.2$) than did the heuristic group ($M = 2.1$, $SD = 1.2$, $F(1, 674) = 6.67$, $p = .010$). The systematic group also indicated that it was more important to provide the right answer ($M = 4.2$, $SD = 1.1$) than did the heuristic group ($M = 4.0$, $SD = 1.2$, $F(1, 674) = 4.22$, $p = .040$). There is, however, no significant difference between the three *modes of data collection* concerning the difficulty (face-to-face: $M = 2.1$, $SD = 1.1$; CATI: $M = 2.3$, $SD = 1.3$; self-administered: $M = 2.2$, $SD = 1.2$; $F(2, 673) = 2.20$, $p = .112$) and the importance of providing the right answer (face-to-face: $M = 4.2$, $SD = 1.1$; CATI: $M = 4.1$, $SD = 1.2$; self-administered: $M = 4.0$, $SD = 1.1$; $F(2, 673) = 1.05$, $p = .349$).

Results

To test the hypotheses and answer the research question, we conducted hierarchical multiple regression analyses. The dependent measure is the cultivation index. Control variables are gender (dummy-coded with male as the reference group) and age. Independent variables are television viewing, intrinsic characteristics (education, dummy-coded with low education as the reference group, and NFC), and extrinsic characteristics (survey mode, dummy-coded with self-administered as the reference group, and experimental variation, dummy-coded with heuristic condition as the reference group). Metric variables were mean-centered. Our hypotheses are tested by the two-way interactions between television viewing and intrinsic as well as extrinsic variables (see Model 2 in Table 2). To answer the research question, three-way interactions between the variables were conducted (see Model 3 in Table 2).

Table 2. Hierarchical Multiple Regression Analyses Predicting the Cultivation Index From Sociodemographics, TV Viewing, Mode of Data Collection, Questionnaire Instructions, and Their Interactions.

	Model 1	Model 2	Model 3
Predictor	*b*	*b*	*b*
Block 1			
TV viewing	0.848***	1.941**	2.475**
Gender (0 = male)	4.041***	3.996***	3.977***
Age	−0.070***	−0.062**	−0.064**
Education (0 = low)	−4.310***	−2.008	−1.918
Need for cognition	−1.586***	−2.129†	−2.023
Mode of data collection (0 = self-administered)			
Face-to-face	−3.026***	−4.258**	−4.907***
CATI	3.196***	4.770***	4.400***
Questionnaire instructions (0 = heuristic)	−0.045	−1.513	−1.702†
Block 2			
TV viewing × Education		−2.546*	−0.488†
TV viewing × NFC		−0.102	0.934
TV viewing × Mode: face-to-face vs. CATI and self-administered		−1.427†	−0.704
TV viewing × Mode: CATI vs. face-to-face and self-administered		2.145*	1.322†
TV viewing × Questionnaire instructions		0.190	0.376
All other 2-way-interaction terms included in the model as well			
Block 3			
TV viewing × Education × Mode: face-to-face vs. CATI and self-administered			3.635*
TV viewing × Education × Mode: CATI vs. face-to-face and self-administered			3.577*
TV viewing x NFC × Mode: face-to-face vs. CATI and self-administered			1.232
TV viewing x NFC × Mode: CATI vs. face-to-face and self-administered			0.279

TV viewing × Education × Questionnaire instructions			−0.205
TV Viewing × NFC × Questionnaire Instructions			0.660
Δ R^2		.01†	.01†
Total R^2	.18***	.19***	.20***

Note. Unstandardized regression coefficients. N = 676.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

For the intrinsic moderators, we find a significant interaction between television viewing and education but not NFC. Therefore, H1 is not supported. However, as stated earlier, this may be due to the low Cronbach's α of the NFC scale. To probe the significant interaction, we used simple slope analysis (Hayes & Matthes, 2009). As shown in Figure 1, only participants with low education are cultivated by television (b = 1.94, $p < .01$). First-order beliefs of highly educated participants are not influenced by television viewing (b = −0.37, p = n.s.). Thus, H2 is supported.

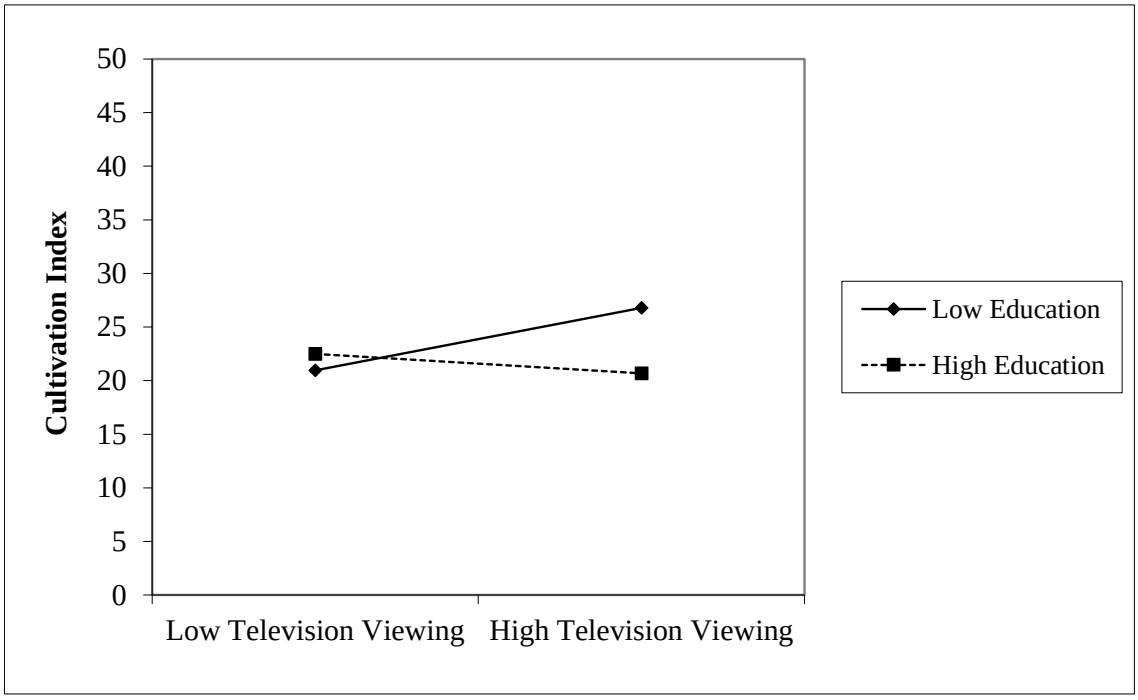

***Figure 1. Simple slope analysis of the two-way interaction between television viewing and education on the cultivation index. Significance of interaction term* p < .05.**

Turning to the extrinsic moderators, questionnaire instructions do not interact with television viewing, so H3 is not supported. However, the interaction between television viewing and survey mode is significant. In line with H4, cultivation is strongest when interviews are conducted via telephone (b = 1.97, p < .05) and weakest when interviews are conducted face-to-face (b = 0.46, p = n.s.), with self-administered interviews falling in between (b = 0.98, p < .05; see Figure 2).

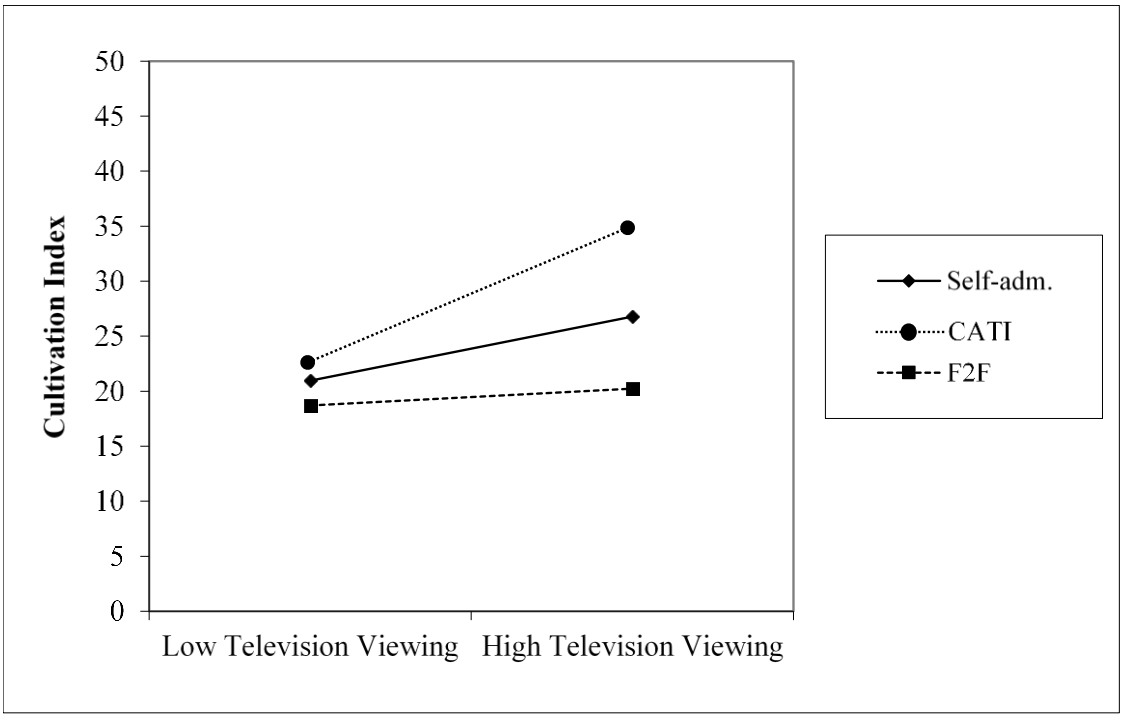

***Figure 2. Simple slope analysis of the two-way interaction between television viewing and survey mode on the cultivation index. Low TV viewing (mean – 1 standard deviation), high TV viewing (mean + 1 standard deviation). Significance of interaction terms* p < .05.**

Finally, we were interested in the person-situation interaction (RQ1). Of the three-way-interactions tested, only the interaction between television viewing, education, and survey mode is significant (see Figure 3). Participants with lower education are prone to the variation of survey mode. Whereas cultivation is detectable within this group when interviewed via telephone (b = 2.48; p < .05) or self-administered (b = 0.98; p < .05), cultivation is eliminated in the face-to-face condition (b = 0.33; p = n.s.). For highly educated participants, the mode of data collection does not moderate the influence of television viewing on first-order beliefs (telephone: b = 0.36, p = n.s.; self-administered: b = –1.07, p = n.s.; face-to-face: b = 0.23, p = n.s.).

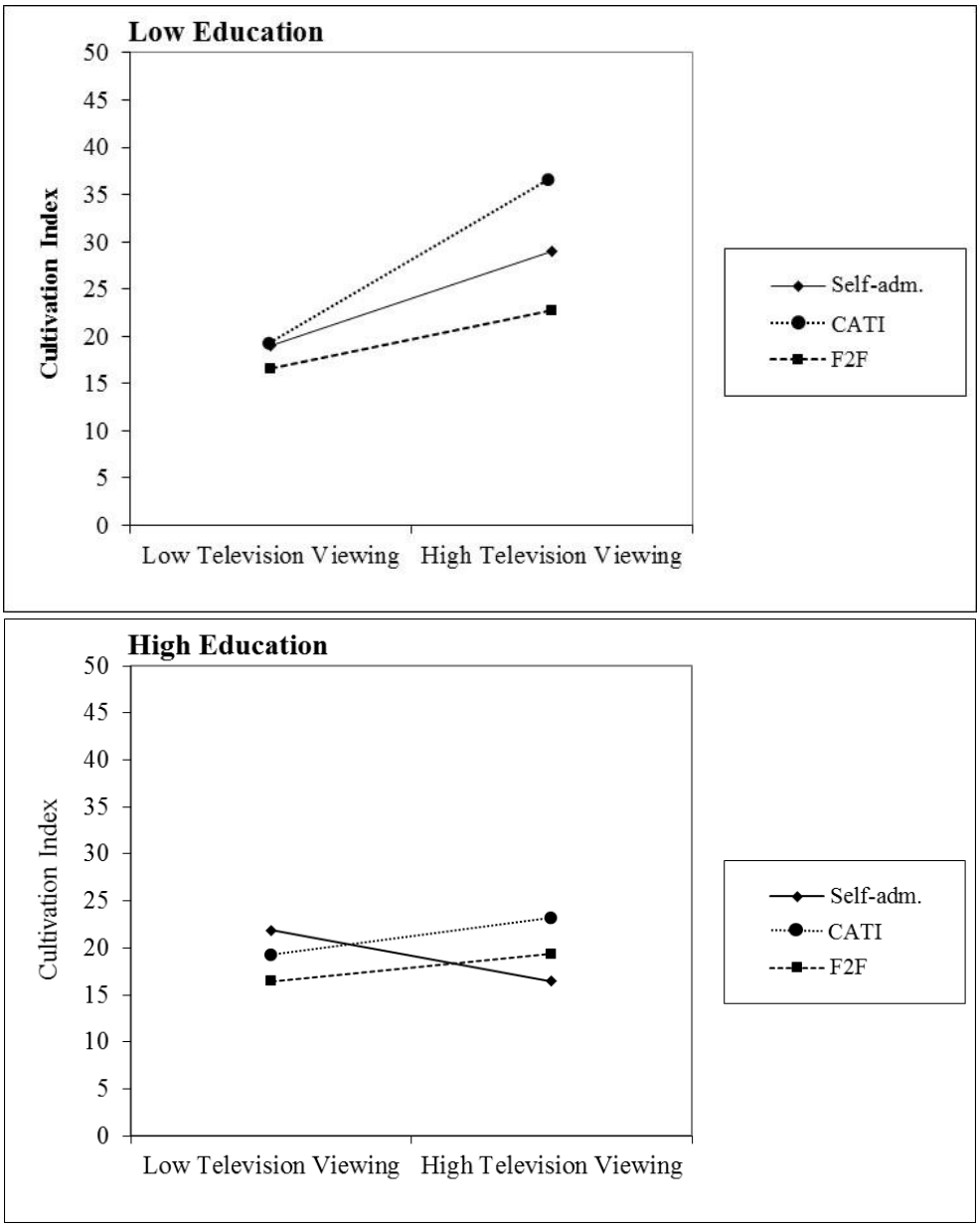

Figure 3. Simple slope analysis of the three-way-interaction between television viewing, education, and survey mode on the cultivation index. Low TV viewing (mean – 1 standard deviation), high TV viewing (mean +1 standard deviation). Significance of interaction terms **p < .05.**

Discussion

Cultivation theory states that those who watch television heavily are more likely to perceive the real world in the way it is presented on television. Research on the underlying processes has mainly dealt with establishing general models of cultivation. Most prominently, the heuristic processing model (Shrum, 2001) is empirically well established. Previous research on the heuristic processing model has shown that intrinsic as well as extrinsic factors potentially influence cultivation of first-order beliefs. This study tested the interaction of personal characteristics (need for cognition and education) and extrinsic factors (survey mode and manipulation of questionnaire instructions). Results indicate that intrinsic (education) as well as extrinsic (survey mode) factors moderate cultivation in line with the heuristic processing model. Additionally, we found a person-situation interaction, indicating that cultivation is influenced by extrinsic factors in different ways, depending on an individual's intrinsic characteristics.

Before addressing and discussing our results in detail, we would like to mention the study's limitations: First, due to time restrictions, especially in the telephone interview condition, we did not use the complete scale to measure need for cognition but only four items, resulting in a Cronbach's α value of .60. This methodological limitation has to be kept in mind, especially due to the null findings for NFC (Schmitt, 1996). Second, we did not randomly assign participants to one of the three survey modes and used different sampling procedures. This may limit the comparability between the three modes and, thus, internal validity. However, the samples do not differ significantly with regard to their central parameters (see Table 1), and participants were not allowed to select which mode they were interviewed in. Therefore, we compared them anyway.

Of the two *intrinsic factors* tested (NFC and education level), only the latter moderates cultivation as hypothesized. Other research testing the interaction between NFC and television viewing yields mixed evidence: Although Shrum, Burroughs, and Rindfleisch (2005) found an interaction, Coenen and van den Bulck (2015) did not. Both studies furthermore dealt with second-order judgments. We do not want to reject the potentially moderating role of NFC in cultivation based on our study because of our measurement of NFC with only four items and a rather low internal consistency. Further research is needed to investigate the disparate results on the role of NFC in cultivation.

Turning to the *extrinsic factors* researched, questionnaire instructions, and survey mode, we, in line with Shrum (2007), find that survey mode affects cultivation: The more the survey situation furthers heuristic processing, the higher the level of cultivation measured. Yet we do not find the expected moderation for the manipulation of questionnaire instructions. We do not find diminished cultivation in those who were manipulated to process systematically. There are a few possible explanations for these divergent results. First, Shrum's (2001) results are based on self-administered interviews. Possibly, the manipulation only worked in this mode. We therefore split the sample and tested the effect of questionnaire instructions separately for each survey mode. The interaction between television viewing and questionnaire instructions, however, was insignificant in all conditions. Second, the moderate manipulation via instructions may be ineffective in a field study conducted outside the laboratory. However, the treatment check indicated that participants noticed the manipulation. Future research should

use stronger manipulations. A possible manipulation for additional research on this topic under field conditions is to promise participants a certain amount of money (or another incentive) if they provide the "right" answer, instead of simply telling them to think more carefully. With an incentive, a stronger positive form of involvement could be achieved.

The core of this study is the *interaction between intrinsic and extrinsic factors*. We posed a research question regarding this interaction with two possible outcomes: First, it is possible that favorable personal characteristics allow for an easier shift toward systematic processing. Thus, people with higher levels of NFC and/or education should show diminished cultivation when extrinsic factors fostering systematic processing are present. People with lower levels of NFC and education should, however, still show higher levels of cultivation. The second possibility is that those with favorable preconditions already show high levels of systematic processing. In this case, participants with higher NFC and/or education should react less to extrinsic factors, because they cannot be as effective in reducing cultivation. Those with lower levels of NFC or education, however, should shift from heuristic to systematic processing when meeting the respective extrinsic factors. Our results support the second possibility: Whereas participants with lower education are prone to the variation of survey mode, the mode of data collection does not moderate the influence of television viewing on first-order judgments for participants with higher education. Thus, in addition to our and Shrum's (2007) results on the general moderating role of survey mode, participants with lower education in a general population sample are affected by survey mode. We interpret our findings as a kind of ceiling effect. Those with favorable personal characteristics may have already been processing systematically, which is why we find no cultivation in this condition.

This does not mean that the first possibility presented above is to be rejected when it comes to person-situation interactions: Shrum (2001) successfully manipulated a student sample by using an accuracy motivation/task importance manipulation (Chaiken, 1980). This sample has favorable preconditions, because the participants are high in education and very likely higher in NFC than a general population sample (Cacioppo & Petty, 1982; Haugtvedt et al., 1992; Haugtvedt & Petty, 1992; Petty & Cacioppo, 1986). This illustrates that the level of systematic processing can be enhanced by extrinsic factors even in case of people with favorable preconditions. Obviously, the person-situation interaction depends on the specifics of a study—for example, aspects of sampling and mode of data collection.

This leads to three implications to be considered by cultivation researchers when conducting studies: (1) Is a specific group (not the general population) surveyed? If so, one should reflect whether this group possesses favorable preconditions to process systematically. This may diminish cultivation, whereas a focus on a group of people with less favorable personal preconditions will foster them. (2) Cultivation differs as a function of survey mode, as already noted by Shrum (2007). The next question is thus: Is the method of data collection favoring heuristic processing? (3) Regardless of the choice of the first two steps, they are likely to cause interaction. Our data support the assumption that the mode of data collection affects cultivation *differently* for people with different personal characteristics. When concentrating on one specific homogeneous group of participants, cultivation may not be observed at all due to a person-situation interaction. This would lead to an underestimation of television's influence on society. "We all too often ignore the importance of the person by situation interaction, putting at risk the scope and applicability of our research" (Sorrentino, 2013, p. 9). Thus, we urge researchers to consider

sampling and data collection carefully and to continue collecting data both in the laboratory and in the field. If possible, these two designs should be combined in a field experiment, because an interaction effect can only be detected with such a design.

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