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The Differential Susceptibility to Media Effects Model

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In this theoretical article, we introduce the Differential Susceptibility to Media Effects Model (DSMM), a new, integrative model to improve our understanding of media effects. The DSMM organizes, integrates, and extends the insights developed in earlier microlevel media-effects theories. It distinguishes 3 types of susceptibility to media effects: dispositional, developmental, and social susceptibility. Using the analogy of a mixing console, the DSMM proposes 3 media response states that mediate media effects: cognitive, emotional, and excitative. The assumptions on which the DSMM is based together explain (a) why some individuals are more highly susceptible to media effects than others, (b) how and why media influence those individuals, and (c) how media effects can be enhanced or counteracted.

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The past decades have witnessed thousands of empirical studies into the cognitive, emotional, attitudinal, and behavioral effects of media on children and adults (Potter & Riddle, 2007). The effect sizes that have been found for most outcome variables are consistent, albeit small to moderate at best. For example, recent meta-analyses on the effects of violent videogames on aggression have yielded effect sizes ranging from $r = .08$ (Ferguson & Kilburn, 2009) to $r = .19$ (Anderson et al., 2010). Likewise, studies of the effects of advertising on materialism have revealed small to moderate effects sizes (Buijzen & Valkenburg, 2003). However, for other outcome variables, media effects are less consistent or even conflicting. This is the case for research on the effects of social media on social connectedness (Valkenburg & Peter, 2011), and for studies of media effects on ADHD and ADHD-related behaviors, such as attention problems (Kirkorian, Wartella, & Anderson, 2008).

Although the small and inconsistent effects reported are not unique to media-effects research, it is important to investigate whether they are truly small or an invalid representation of the underlying effect sizes in the population. Invalid small and inconsistent media effects can be due to methodological weaknesses, in particular unreliable media use measures, which may lead to the attenuation of effect sizes. Invalid small and inconsistent effects can also result from a suboptimal

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conceptualization of media effects, a position we take in this article. In our view, a possible cause of the small and inconsistent media effects is that insights of existing media-effects theories have not been systematically evaluated and synthesized in a comprehensive media-effects model.

The overall aim of this article is to organize the media-effects literature in order to achieve more conceptual coherence about the role of media variables (media use, media processing) and nonmedia variables (individual-difference variables, social context) in media effects research. Although media-effects theories typically include media and nonmedia variables in their conceptions, there is still insufficient consensus about how to conceptualize the roles of and relationships between these variables. On the basis of a review of existing media-effects theories, we introduce a new, integrative model to better understand the roles of, and relationships between, media and nonmedia variables in media-effects theories. The model, which we have named the *Differential Susceptibility to Media Effects Model* (DSMM), focuses on microlevel media effects. Microlevel media-effects theories base their inferences on observations of the individual media user.

The DSMM builds upon earlier individual-level media-effects theories that have been identified as well-cited theories in the reviews of Bryant and Miron (2004), Potter and Riddle (2007), and Potter (2012). These theories are Bandura's (1986) Social Cognitive Theory; Berkowitz' (1984) Neoassociationist Model and other accounts of Media Priming (Roskos-Ewoldson & Roskos-Ewoldson, 2009); Klapper's (1960) Selective Exposure Theory; Lang's (2009) Limited Capacity Model of Motivated Mediated Message Processing; Markus and Zajonc's (1985) Orientations-Stimulus-Orientations-Response (O-S-O-R) Model and its extensions in communication research (e.g., Communication Mediation Model; McLeod, Kosicki, & McLeod, 2009); Petty and Cacioppo's (1986) Elaboration Likelihood Model; Katz, Blumler, and Gurevitch's (1973) Uses-and-Gratifications Theory; and microlevel variants of Cultivation Theory (Shrum, 2009). It also builds upon some recent well-cited media-effects theories, in particular Slater's (2007) Reinforcing Spiral Model, and upon several theories that have been used to understand media effects on youth: Anderson and Bushman's (2002) General Aggression Model, Potter's (1999) Lineation Theory, and Steele & Brown's (1995) Media Practice Model.

Throughout this article, we refer to media effects as the deliberative and non-deliberative short- and long-term within-person changes in cognitions, emotions, attitudes, beliefs, physiology, and behavior that result from media use (see Potter, 2011, 2012, for definitions and more elaborate conceptualizations of these six types of media effects). Media use, if not indicated otherwise, is defined broadly as the intended or incidental use of media types (e.g., TV, computer games), content (e.g., entertainment, advertising), and technologies (e.g., social media).

Organizing existing media-effects theories along five global features

The aim of this article is to achieve more conceptual coherence about the role of media variables and nonmedia variables. While reviewing the existing microlevel

media-effects theories, we observed that these theories could be organized along the following five global features that address the relationships between media and nonmedia variables.

Conditional media effects

Models that propose conditional media effects share the notion that effects of media on cognitions, emotions, attitudes, beliefs, physiology, and behavior can be enhanced or reduced by individual-difference (e.g., gender, temperament, developmental level) and social-context variables (e.g., parents, peers). These variables are moderators, that is, variables that modify the direction and/or strength of the effect of media use on a given outcome. If a moderator is valid, a media effect is conditional, which means that it does not equally hold for all media users. An example of a conditional media-effects model is Bandura's (2009) Social Cognitive Theory in which preexisting self-efficacy is conceptualized as a moderator of media-promoted behavior. Similarly, in Petty and Cacioppo's (1986) Elaboration Likelihood Model, need for cognition, the tendency to enjoy effortful information processing, is seen as a moderator of media effects. Finally, Klapper's (1960) Selective Exposure Theory, Potter's (1999) Lineation Theory, Uses-and-Gratifications Theory (Rubin, 2009), and Slater's (2007) Reinforcing Spiral Model recognize that individual-difference and social-context factors interact with media effects. Like these earlier theories, the DSMM rejects universal media effects and acknowledges that nonmedia variables moderate media effects.

Indirect effects type I: *media use as a mediator*

The media-effects literature typically conceptualizes three types of indirect effects. The first type considers *media use* as a mediator between individual-difference variables and outcomes of media use (Slater, 2007). A mediator, or intervening variable, is a variable that provides a causal link between an independent and a dependent variable. In indirect-effects type I models, media use is predicted by individual-difference variables, such as gender, developmental level, and temperament. Media use, in turn, provides the causal connection between these individual-difference variables and the outcomes of interest. For example, teenagers high in sensation seeking are predisposed to use violent media, which in turn will stimulate their aggressive behavior. Examples of such models are Anderson and Bushman's (2002) General Aggression Model, Bandura's (2009) Social Cognitive Theory, Klapper's (1960) Selective Exposure Theory, McLeod et al.'s (2009) Communication Mediation Model, and Slater's (2007) Reinforcing Spiral Model. The DSMM also conceptualizes this type of indirect effect.

Indirect effects type II: *media response states as mediators*

Models that conceptualize this type of indirect effect consider the mental and physiological processes that occur during media use as a mediator between media use and outcomes. For example, exposure to an arousing news item may stimulate viewers' attention and physiological arousal, which in turn stimulate their recall of,

or attitudes toward, the news issue. Many media-effects theories recognize that the processes that occur while using media are the causal links between media use and media effects. These processes are named differently in various theories. They have been named message processing (Lang, Potter, & Bolls, 2009; Petty, Briñol, & Priester, 2009), exposure states (Potter, 2009), reception-activity orientations (McLeod et al., 2009), internal states (Anderson & Bushman, 2002), selective perception (e.g., Klapper, 1960), and online judgments (Shrum, 2009). Similar to these theories, the DSMM acknowledges that the mental and physiological processes that occur during media use mediate media effects. We call these processes media response states.

Indirect effects type III: media effects as mediators

Models that include media *effects* as mediators recognize that media effects themselves can be the cause of other media effects. These effects, which we call mediating media effects, provide the underlying mechanisms of (or causal route to) second-order media effects. The difference between mediating media effects and media response states is that media response states typically occur *during* media use. Mediating media effects *can* start during media use but they last beyond the media use situation. For example, adolescents' use of social media can enhance their intimate self-disclosure to friends (mediating media effect), which in turn influences their perceived quality of these friendships (second-order media effect; Valkenburg & Peter, 2009). Likewise, informational media use stimulates interpersonal discussion (mediating media effect), which in turn enhances participatory behavior (second-order media effect; Social Cognitive Theory, Bandura, 2009; Communication Mediation Model, McLeod et al., 2009; Two-Step Flow of Communication Theory, Lazarsfeld, Berelson, & Gaudet, 1944). The DSMM also recognizes mediating media effects.

Transactional media effects

Finally, models that conceptualize transactional media effects propose that outcomes of media use also influence media use. Transactional media-effects models consider media use and media effects as parts of a reciprocal over-time influence process, in which the media effect is also the cause of its change (Früh, & Schönbach, 1982). For example, adolescents' use of violent media may increase their aggressive tendencies, which may then stimulate their violent media use (Slater, 2007). Media-effects theories that include transactional effects are Anderson and Bushman's (2002) General Aggression Model, Bandura's (2009) Social Cognitive Theory, Slater's (2007) Reinforcing Spiral Model, and Steele and Brown's (1995) Media Practice Model. The DSMM also recognizes transactional media effects.

Synthesizing existing media-effects theories

While reviewing the existing microlevel media-effects theories, we noted a lack of consensus about what the media-effects process exactly entails. Some media-effects

theories focus predominantly on one type of indirect effects, for example on our indirect effects type I, in which media use is conceptualized as a mediator (e.g., Klapper, 1960; Slater, 2007). Others conceptualize indirect effects type I and type II (e.g., O-S-O-R model, Markus & Zajonc, 1985; Neoassociationistic Model, Berkowitz, 1984). Still others conceptualize all three types of indirect effects (Communication Mediation Model, McLeod et al., 2009). Theories that focus on indirect effects, and the research that follows from it, typically devote less attention to conditional effects (e.g., Sotirovic & McLeod, 2001; but for exceptions, see e.g., Holbert, 2005; Slater, 2007). In our view, however, we need models that systematically conceptualize conditional *and* indirect media effects. Only if we investigate both types of effects can we truly understand (a) which individuals are more highly susceptible to media effects than others, (b) how and why media use influences those individuals, and (c) how media effects can be enhanced or counteracted.

In the media-effects literature, there are some more comprehensive models that do conceptualize conditional and indirect effects. Both the General Aggression Model (Anderson & Bushman, 2002) and the Elaboration Likelihood Model (Petty et al., 2009) contain four of the five features of media-effects theories, but do not include media effects as mediators (General Aggression Model) or transactional effects (Elaboration Likelihood Model). The only theory that, to our knowledge, encompasses all five features of media-effects theories is Bandura's (2009) Social Cognitive Theory. Unfortunately, Social Cognitive Theory has only been scantily integrated in the media-effects literature (Pajares, Prestin, Chen, & Nabi, 2009). Social Cognitive Theory is a comprehensive theory with broad concepts that are related to one another in complex ways. As a result, it is often difficult to distill the meanings of its concepts and their exact links to other concepts, which might have hindered the empirical testing of its underlying mechanisms. However, due to the high potential of Social Cognitive Theory to understand media effects, the DSMM attempts to clarify some of its propositions, and, by doing so, stimulate its integration in media-effects research.

While reviewing earlier media-effects theories, we also observed a lack of consensus about the role of, and relationships between, media and nonmedia variables. In some theories, specific media variables are considered as mediators between media use and effects. In other theories, these same variables are conceptualized as moderators. For example, some theories consider media response variables, such as identification with characters and reality perception, as a *mediator* between media use and media effects (e.g., Transportation Theory; Green, Brock, & Kaufman, 2004; Extended Elaboration Likelihood Model, Slater, & Rouner, 2002). In other theories and empirical research, these same variables are conceptualized as *moderators* (e.g., Cultivation Theory, Shrum, 2006; Social Cognitive Theory, Bandura, 1986). An important aim of the DSMM is to more precisely identify the roles of and relationships between media and nonmedia variables and to specify the conditions under which these variables should be seen as a moderator or as a mediator in the media-effects process.

The DSMM: four related propositions

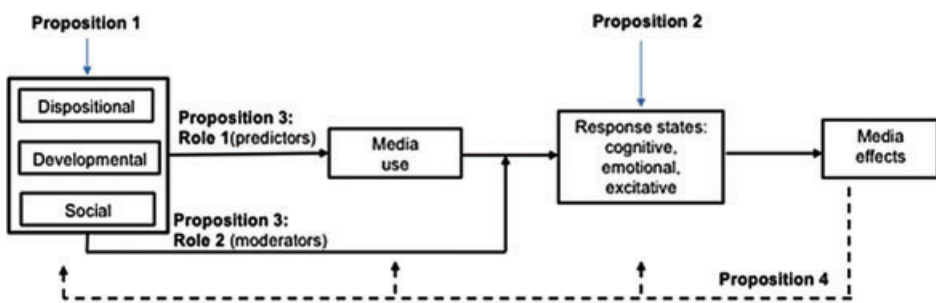
The DSMM consists of an integrated set of four related propositions that set forth the relations between the media and nonmedia variables that have been proposed in earlier media-effects theories. The DSMM recognizes and integrates all five features of earlier media-effects theories that we distinguished. The four propositions that follow involve only extensions to or specifications of these earlier theories. These propositions will particularly focus on conditional media effects, indirect effects type II (media response states as mediators), and transactional media effects.

Conditional media effects: three types of susceptibility

An important aim of several earlier media-effects theories has been to identify the various conditions under which media effects are more or less present. Unfortunately, the literature has not been consistent in its conceptualization of the conditional variables that affect the media-use-and-effects relationship. The DSMM conceptualizes three broad types of conditional variables, which we name differential-susceptibility variables. These differential-susceptibility variables are all preexisting; they are assessable before the media use situation. Proposition 1 is visualized in the left-hand square in Figure 1.

Proposition 1: Media effects are conditional; they depend on three types of differential-susceptibility variables: dispositional, developmental, and social.

Dispositional susceptibility is defined as all person dimensions that predispose the selection of and responsiveness to media, including gender, temperament, personality, cognitions (e.g., scripts and schemata), values, attitudes, beliefs, motivations, and moods. Some of these dimensions (e.g., personality, temperament) are more stable across time and situations than others (e.g., mood, motivations; Gray & Watson,



- Proposition 1:** Media effects depend on three types of differential susceptibility variables.
- Proposition 2:** Three media response states mediate the relationship between media use and effects.
- Proposition 3:** The differential susceptibility variables have two roles: they act as predictors and moderators.
- Proposition 4:** Media effects are transactional.

Figure 1 The four propositions of the Differential Susceptibility to Media Effects Model (DSMM).

2001). However, the distinction between stable and transient dimensions is often not clear-cut. First, even the most stable personality traits change over time and in response to environmental influences (Rothbart & Sheese, 2007). Second, more transient dimensions (e.g., moods) can last for hours or even days, and are to a certain extent a reflection of one's general cognitive and affective traits (Gray & Watson, 2001). In the DSMM, we conceive both stable and more transient person dimensions as relevant to media use and responsiveness.

Developmental susceptibility is defined as the selective use of, and responsiveness to, media due to cognitive, emotional, and social development. Developmental level predisposes media use in all developmental stages across the life span. However, its influence is the strongest in childhood and early adulthood and becomes smaller in middle and older adulthood. In middle and older adulthood, development is easily confounded with life-situation variables that may more strongly determine media use (e.g., caring for children in early and middle adulthood; health problems and lack of mobility in older adulthood; Mares & Woodard, 2006; van der Goot, Beentjes, & van Selm, 2006).

Social susceptibility is defined as all social-context factors that can influence an individual's selective use of and responsiveness to media. These social contexts can act on a micro (interpersonal context: e.g., family, friends, peers), meso (institutional context: e.g., school, church, work), and macro level (societal context: e.g., cultural norms and values; Ecological Systems Theory, Bronfenbrenner, 1979). Parents and peers can restrict or stimulate exposure to certain television programs or games. Similarly, schools, organizations, or governments can forbid or encourage access to certain Internet websites. Finally, the norms and values in a given society may disable or enable individuals to use particular media.

Indirect media effects: three media response states

Although several earlier media-effects theories have focused on the processes that occur during media use, the literature has been hindered by a lack of agreement about the types, terminology, and conceptual role of these processes. The DSMM distinguishes three media response states: cognitive, emotional, and excitative. All these response states have been identified in earlier media-effects theories (cognitive: Bandura, 2009; Lang, 2009; Petty et al., 2009; Shrum, 2009; emotional: Potter & Bolls, 2012; Slater & Rouner, 2002; and excitative: Anderson & Bushman, 2002). However, they have rarely been integrated into one media-effects model (for an exception, see Anderson & Bushman, 2002).

***Proposition 2:** Media effects are indirect; three media response states mediate the relationship between media use and media effects.*

Despite their central role in some media-effects theories, media response states are often not explicitly operationalized in media-effects research. Mediating or indirect variables, including media response states, are more often theorized than

empirically investigated (Potter, 2011). In the DSMM, media response states are conceptualized as state variables that originate from media use. Therefore, they are seen as *mediators* between media use and media effects. Figure 1 visualizes the mediating role of the three media response states. Media response states have been conceptualized as *moderators* in some earlier theories (e.g., Bandura, 1986; Shrum, 2006). We agree that such concepts can be conceived as moderators but only when they represent a preexisting, trait-like tendency to respond to media in a specific way. In the DSMM, trait-like tendencies to respond to media are conceptualized as dispositional-susceptibility variables.

Cognitive response state

Cognitive response states have been defined as “attention and retention” in Social Cognitive Theory (Bandura, 2009), as “absorption” and “counterarguing” in the Extended Elaboration Likelihood Model (Slater & Rouner, 2002), and as “accessibility of constructs” in Media Priming Theories (e.g., Berkowitz, 1984). In the DSMM, a cognitive response state refers to the extent to which media users selectively attend to and invest cognitive effort to comprehend media content (i.e., the message, the story line, the motivations, and perspectives of characters; Salomon, 1979). Concepts like cognitive absorption, reality perception, the cognitive dimensions of empathy (i.e., perspective taking), and counterarguing also represent cognitive response states.

Emotional response state

Microlevel media-effects research dealing with emotional response states is closely linked to psychological research. As a result, the conceptualization of emotional response states suffers from the same problems that hinder psychological research. For example, some psychologists define emotion as the umbrella term for all physiological, affective, and cognitive changes that occur in response to an internal or external stimulus. Others see affect as the experiential part of emotion, and again others use the concepts emotion and affect interchangeably (Davidson, 2003). In the DSMM, we concur with the latter vision. An emotional response state encompasses all affectively valenced reactions to media content (i.e., the message, the story line, and the vicarious affective reactions to characters). The emotional dimension of state empathy (i.e., the experience of emotions that are similar to those experienced by media characters) and sympathy (concern for media characters) are also seen as emotional response states.

Excitative response state

An excitative response state refers to the degree of physiological arousal (i.e., the activation of the sympathetic nervous system) in response to media (Lang et al., 2009). In dimensional views of emotions (e.g., Russell, 2003), physiological arousal is seen as an integral part of emotional processing. In these views, emotions consist of two orthogonal continuous dimensions: valence (i.e., pleasant–unpleasant) and intensity (i.e., high–low arousal). However, several media-effects theories, such as

Excitation-Transfer Theory (Zillmann, 1983) and Desensitization Theory (Cline, Croft, & Courier, 1973), conceptualize arousal as a unique mediator of media effects. In the DSMM, we regard the excitative response state as an independent (although interactive) media response state.

The mixing console analogy

Historically, emotions and cognitions have been seen as largely separate. However, contemporary researchers no longer view them as distinct forces within the human mind, and argue that they should be studied simultaneously and interactively (Duncan & Barrett, 2007; Vorderer, Klimmt, & Ritterfeld, 2004). In the DSMM, we concur with this position. However, we do believe it is useful to investigate cognitive, emotional, and excitative response states as separate entities because most individuals do experience thoughts, feelings, and arousal as separate (Barrett, Mesquita, Ochsner, & Gross, 2007; Bradley & Lang, 1994). Thus, while the cognitive, emotional, and excitative response states may ontologically not be distinct, phenomenologically they are (for more elaborate discussions, see Duncan & Barrett, 2007; Barrett et al., 2007).

To clarify the mutual inclusiveness of the three media response states, we use the mixing console as an analogy. Imagine a mixing console for music in a recording studio. Our mixing console consists of three sliders, which represent the cognitive, emotional, and excitative response states. According to the DSMM, in some media use situations all three sliders can be high. For example, when individuals watch a soccer game of their favorite team on television, it is conceivable that their cognitive, emotional, and excitative sliders are high. A similar intensity of engagement may occur when individuals play a highly involving computer game, such as a first-person shooter (Nacke & Lindley, 2008). In other media-use situations, the cognitive and emotional sliders may be particularly high and the excitative slider relatively low, for example when one watches sad media content, which generally leads to less arousal than violent content (Davydov, Zech, & Luminet, 2011; Krahe et al., 2011). In again other situations, the excitative slider may be particularly high, for example, when males watch pornography (Murnen & Stockton, 1997).

Until the evidence shows otherwise, the DSMM assumes that media effects are most evident and long lasting when the cognitive, or the cognitive and emotional or excitatory sliders, are high. This assumption is in line with most other media-effects and persuasion theories. The Elaboration Likelihood Model (Petty et al., 2009) argues that media effects are more enduring when the cognitive slider is high. This “high-cognitive processing-strong-effects assumption” is also assumed in Social Cognitive Theory (Bandura, 2009), psychological approaches to Cultivation Theory (Shrum, 2009), and Uses-and-Gratifications Theory (Rubin, 2009). Other media theories predict that the combination of a high cognitive and a high emotional slider results in the strongest media effects. For example, Transportation Theory posits that transported media users are cognitively, emotionally, and, depending on the theme of the story (e.g., sad vs. violent or sexual), physiologically involved, and that this state leads to the strongest media effects (Green et al., 2004). This also holds

for other theories that emphasize emotional response states (Anderson & Bushman, 2002; Slater & Rouner, 2002).

Some theories argue that media effects can occur when the cognitive slider of the mixing console is low (e.g., heuristic information processing; Petty et al., 2009) or when all sliders of the mixing console are low, a state which implies an automatic or unconscious media response state (Lang et al., 2009; Potter, 2009). A growing number of media-effects researchers, in particular advertising researchers, have attempted to study unconscious media effects. An important hindrance of this line of research is that self-report measures are not feasible, and that researchers must rely on physiological measures (e.g., skin conductance, ECG, fMRI) and implicit measures, such as implicit association tasks, to measure response states. Although unconscious media effects are plausible, the findings are still mixed, perhaps because most physiological and implicit tests are not yet sophisticated enough to reveal unconscious media effects (Moorman, 2010).

Finally, the DSMM assumes that, in some media-use situations, media effects might be deliberately reduced. This self-induced reduction in media effects may occur through self-regulation capacities of media users (Gross & Thompson, 2007). When one or more of the sliders are too high, for example when media content is too arousing, difficult, unrealistic, or inconsistent with existing beliefs, media users start to feel uncomfortable. In such situations, they can deliberately or automatically down-regulate their media response states, for example by strategic attention deployment (e.g., looking away from the screen) or by employing cognitive reappraisal strategies, that is, strategies to change the meaning of a stimulus to alter its impact (Gross & Thompson, 2007).

Unsolved issues

One unsolved problem is that we do not yet understand well enough which specific media content leads to which types of response states. It has been found that violent content leads to more physiological arousal than sad media content (Krahé et al., 2011), but even within the genre of sad media, arousal levels differ (Davydov et al., 2011). Another unsolved problem is that some combinations of media response states, for example a high cognitive/high emotional response state, may present a *qualitatively* rather than a quantitatively different type of response state (see Potter, 2009, for a conceptualization of qualitatively different response states). Lastly, we still lack the empirical evidence that shows which combination of response states leads to the strongest media effects. Although experimental media-effects research is progressively focusing on media response states, too few studies have linked response states to outcome variables (Lang et al., 2009). Future research should therefore elaborate on the propositions of the DSMM, and investigate (a) what media content leads to specific combinations of response states, (b) how media-induced response states vary across individuals, and (c) which combinations of response states result in what kind of media effects.

Multiple roles of the differential-susceptibility variables

An extension of earlier media-effects models in the DSMM is the conceptual role of the three types of differential-susceptibility variables. The DSMM assigns two different conceptual roles to these variables. First, they all predict media *use* (see the path named “Role 1” from the differential-susceptibility variables to media use in Figure 1). Second, they all stimulate or reduce media *effects*. This happens through their moderating influence on the effect of media use on media response states (see the path named “Role 2” in Figure 1; by convention, moderation is visualized by a path orthogonal to the causal path that is moderated). Thus, the DSMM argues that media use and the differential-susceptibility variables have an interactive influence on the media response states: Certain characteristics of media (e.g., content or formal features) influence media response states, but this influence depends on dispositional, developmental, and social-context differences among media users.

Proposition 3: *The differential-susceptibility variables have two roles; they act as predictors of media use and as moderators of the effect of media use on media response states.*

Qualitative critical audience research has frequently emphasized that audiences differ in their interpretations of media content (Livingstone, 1998), and that these interpretations partly depend on gender, class, race, and age (Kim, 2004; Morley, 1980). However, none of the social science-based media-effects theories has, to our knowledge, explicitly assigned multiple roles to any of the differential-susceptibility variables. In social-science theories, differential-susceptibility variables have been conceptualized as a predictor, mediator, *or* moderator. A close review of these theories does suggest that some of them assign multiple roles to these variables, albeit only implicitly. For example, preexisting self-efficacy in Social Cognitive Theory is assumed to predict media use *and* moderate its effects. Likewise, in the Elaboration Likelihood Model (Petty et al., 2009), motivation and ability to process seem to predict media use and moderate its effect on message processing. To our knowledge, however, these implicit propositions have never been investigated empirically. The concurrent roles of the DSMM provide the theoretical equivalent of a specific type of moderated mediation in which a predictor of variable *X* is also the moderator of the effect of variable *X* on variable *Y* (Preacher, Rucker, & Hayes, 2007).

Proposition 3 implies that the variables that predispose media use also moderate the effects of media use on the three media response states. Individuals have the tendency to seek out media that, at least to a certain extent, converge with their dispositions (Klapper, 1960), developmental level (Valkenburg & Cantor, 2000), and the norms that prevail in the social groups to which they belong (McDonald, 2009). It is conceivable that these same variables also moderate the effects of media on media response states. In the next sections, we discuss how and why the variables that

predispose media use also moderate the effects of media use on the media response states.

Dispositional susceptibility

Evidence

The empirical evidence for the effect of dispositions on media use is strong. Most dispositional variables identified in the DSMM, including gender, personality/temperament (e.g., neuroticism, trait aggression, need for affect, need for cognition, sensation seeking), cognitions (scripts and schemata), attitudes, motivations, identity, and moods (e.g., sadness, happiness) have been shown to predispose media use (for reviews, see Kracmar, 2009; Knobloch-Westerwick, 2006; Oliver, Kim, & Sanders, 2006). The evidence for the moderating role of these variables on media response states is less strong, but not absent. A high need for cognition moderates message effects on cognitive response states (Cacioppo, Petty, Feinstein, Blair, & Jarvis, 1996; Shrum, 2009). Trait aggressiveness moderates media violence effects on the cognitive (e.g., misinterpretation of ambiguous nonviolent acts) and emotional response states (e.g., decreased empathy with characters; Kracmar, 2009; Schultz, IZard, Ackerman, & Youngstrom, 2001). Finally, need for affect and trait empathy enhance emotional response states when watching sad or frightening films (Kracmar, 2009; Oliver & Krakowiak, 2009).

Explanation

The simultaneous roles of dispositional variables outlined in Proposition 3 can be explained by what we call *the disposition-content congruency hypothesis*. This hypothesis states that media content that is in part congruent with one's dispositions is more likely to lead to media effects than incongruent media content (Klapper, 1960). Individuals have a tendency to seek out media that do not diverge too much from their preexisting cognitions, emotions, attitudes, beliefs, and behavior (Klapper, 1960, Oliver et al., 2006; but for exceptions see Smith, Fabrigar, Powell, & Estrada, 2007). However, dispositionally congruent media content can also influence the media response states of the media user. This process can be explained by processing fluency, the objective or subjective ease with which individuals process information (Alter & Oppenheimer, 2009). In comparison to dispositionally incongruent content, congruent content is processed faster and more efficiently because it can be related to more existing mental schemata of the media user. Therefore, the processing of congruent content requires less cognitive effort, which leaves more resources available for the processing of less salient content (Alba & Hutchinson, 1987; Lang, 2009). Dispositionally congruent content can also affect *emotional* response states through processing fluency. Congruent content enhances the media users' experience of familiarity or at least their illusion of familiarity (Whittlesea, 1993). This (illusion of) familiarity in turn enhances positive affect and aesthetic pleasure (i.e., pleasurable experiences toward objects that are not mediated by reasoning). This process has been labeled as the hedonistic fluency hypothesis (Reber, Schwarz, & Winkielman, 2004).

Congruent media content can also affect the response states because of a more elaborate spreading activation in the semantic network of the brain. According to Media Priming Theories (e.g., Berkowitz, 1984) different “nodes” (e.g., cognitions, emotions) are all stored in semantically related associative networks. When one node (e.g., a cognitive one) in the network is activated, other nodes (e.g., emotional ones) are also simultaneously activated. Because dispositionally congruent content stimulates more and more different nodes in the semantic network, it can affect all three media response states.

Developmental susceptibility

Evidence

Cognitive and emotional developmental levels are strong predictors of media use and preferences (Valkenburg & Cantor, 2000; van der Goot et al., 2006). Toddlers are mostly attracted to media with a slow pace and familiar contexts; preschoolers typically like a faster pace and more adventurous fantasy contexts; children in middle childhood seek for realistic content, from which social lessons can be learned; adolescents typically go for media that portray humor based on taboos and irreverent or risky behavior; and older adults more often prefer nonarousing and uplifting media content (Mares, Oliver, & Cantor, 2008; Mares & Woodard, 2006; Valkenburg & Cantor, 2000).

Evidence for the moderating role of developmental level on the media response states is scarce. In comparison to older children and adults, younger children are less effective in investing cognitive effort during media use. They often still lack the knowledge and experience to which they can relate new information. Younger children also react with stronger physiological arousal to violent and frightening media, even if this content is unrealistic (Valkenburg & Cantor, 2000). Finally, middle and older adults invest more cognitive effort in processing positive stimuli (e.g., babies), whereas younger adults invest more cognitive effort in processing negative stimuli (e.g., mutilations; Mares et al., 2008).

Explanation

The moderate-discrepancy hypothesis (Valkenburg & Cantor, 2000) offers a viable explanation why developmental level predisposes media use and moderates its effects on media response states. In general, individuals prefer media content that is only moderately discrepant from their age-related comprehension schemata and emotional experiences. If they encounter media content that is too discrepant from these schemata and experiences, they will either avoid it or allocate less attention to it. The underlying mechanisms of the moderate-discrepancy hypothesis are similar to those that explain why dispositionally congruent content is processed faster and more effectively. Moderately discrepant media content, which is by definition in part familiar to the media user, is likely to be processed more fluently. Moderately discrepant content can also more easily be related to existing schemata than fully discrepant content. As a result, it can activate more and more different nodes (e.g., emotions, cognitions) in the semantic network.

Social susceptibility

Evidence

Social contexts at the micro, meso, and macro level are powerful in encouraging or discouraging media use (Klapper, 1960; McDonald, 2009). Social influences occur in two ways: deliberately, when parents, siblings, schools, or institutions restrict or regulate media use (Jordan, 2004; Nathanson, 2001), or more candidly, through the prevailing norms in the family, peer group, or (sub)cultures (McDonald, 2009). Social contexts can also amplify or dampen media response states. When physical violence is accepted in children's families, children learn to interpret media violence differently (Schultz et al., 2001), and become more susceptible to media effects on aggression (Krcmar, 2009). Social contexts can also moderate media response states during shared media use. Parents can deliberately channel their children's media response states while co-using media, for example by explaining content or by reassuring their children (Nathanson, 2001). Moderating effects on media response states also happens more candidly due to "emotional contagion" (McDonald, 2009). Because media users are very sensitive to others' attitudes, moods, and emotional reactions, their own cognitive, emotional, and excitative response states can be intensified or dampened during shared media use.

Explanation

An important question that has been under theorized in media-effects research is how and under which conditions social contexts can reinforce or override dispositionally and developmentally induced media preferences and effects. Social contexts can moderate media effects by exerting a converging or a contradictory influence (Chaffee, 1986). The *context-content convergence hypothesis* states that media effects are amplified if the messages converge with the opinions, values, and norms in the social environment of the media user. In cultivation theory, this phenomenon is called resonance: When something experienced in the media is similar to one's social environment, it creates a "double dose" of the message, which enhances media effects (Gerbner, Gross, Morgan, & Signorielli, 1980, p. 15). Context-content convergence can be explained by the interplay of two basic human needs: the need to belong (Baumeister & Leary, 1995) and the need to be consistent (Festinger, 1957). The need to belong is one's tendency to form and maintain relationships and to give and receive affect. If individuals lack belongingness, they experience distress. The convergence of one's own opinions, norm, and values with those of one's social environment is experienced as psychological closeness, which, in turn, leads to positive affect and happiness (Baumeister & Leary, 1995).

In the case of context-content *contradiction*, media effects should be weaker. In this case a *dissonance effect* occurs, an effect opposite to Gerbner et al.'s (1980) resonance effect. When media users are confronted with contradictory messages, they are less persuadable because they experience dissonance, a state of discomfort that is caused by conflicting cognitions (Festinger, 1957). Dissonance is typically resolved by altering cognitions. Media users can either change their cognitions about the media

message or their cognitions about their social environment. The first option is more common than the second one. Interpersonal sources are generally perceived as more credible and persuasive than media content (Chaffee, 1986; Klapper, 1960). Owing to their need to belong *and* their need to be consistent, media users are consequently more likely to alter their cognitions about media messages to achieve, retain, or regain context-content congruency.

In the less common case that media users alter their cognitions about their social environment in favor of the media messages, they dismiss the counterinformation provided by their environment. This can happen if they perceive their social environment as less credible or authoritative than the media message or messenger. Adolescents, for example, have a tendency to question their parents' authority in domains that involve personal issues, such as friendships and media use (Smetana, 1995). If parents exert social influence in these domains, reactance may occur. Reactance is an aversive affective reaction toward regulations that intrudes into one's perceived freedom or autonomy (Brehm & Brehm, 1981). Reactance can eventually lead to opposite reactions than the ones that parents, for example, tried to encourage. The specific interactions between media and social-context effects have received little attention in the media-effects literature (for exceptions, see e.g., Hornik, 2006). Future media-effects research should more systematically theorize and investigate when and how different social-contexts interact with media effects.

Media effects are transactional

In line with earlier media-effects models (e.g., Bandura, 2009; Slater, 2007), the DSMM recognizes transactional media effects, that is, the notion that outcomes of media influence can also cause media use. The DSMM extends these earlier models in two ways. First, it also proposes that media outcomes influence media response states. Second, it states that media outcomes affect the differential-susceptibility variables. Media effects thus have a reciprocal causal effect on media processing, media use, and the differential-susceptibility variables (as indicated by the broken lines in Figure 1).

***Proposition 4:** Media effects are transactional; they not only influence media use, but also the media response states, and differential-susceptibility variables.*

Transactional effects between media effects and media response states have received little research attention. Still, some studies have pointed to this transaction. In a study on the effects of pornography featuring underage actors, Paul and Linz (2008) suggested that individuals who repeatedly view this type of pornography become more habituated to, and less negative about, the idea of sexual interactions with underage youth. The more the negative evaluations of the content decrease, the more these individuals may realize that the pornography is arousing. Increased knowledge as an outcome of media use can also improve subsequent cognitive processing of media content (Lang, 2009). Increased knowledge reduces the cognitive

effort necessary for processing content and thus frees other cognitive resources, which can be used for a more elaborate processing (Alba & Hutchinson, 1987; Lang, 2009). Finally, adolescents who frequently watch pornography more often tend to see women as sex objects, which in turn increases their emotional responses to this material (Peter & Valkenburg, 2009).

Several existing media-effects theories have put forward the notion of transactions between media effects and differential-susceptibility variables. The idea that media effects affect an individual's disposition has been outlined most clearly in the General Aggression Model (Anderson & Bushman, 2002), which states that repeated exposure to violent media content leads to an aggressive personality. Similarly, the Media Practice Model (Steele & Brown, 1995) proposes that media effects can influence adolescents' development in the sense that their identities change after they incorporate media content into their selves. Finally, media effects can influence individuals' social context (McDonald, 2009), for example when parents restrict their children's access to particular media content after having observed undesirable effects on their children (Gentile, Nathanson, Rasmussen, Reimer, & Walsh, 2012).

The DSMM in future research

Conditional and indirect media-effects models are inevitably more complex and less parsimonious than universal and direct media-effects models. Still, we hope that future researchers elaborate on our insights even if they utilize only parts of the DSMM as their theoretical basis. The propositions of the DSMM can be tested in all types of studies, including observational studies in families or peer groups and cross-sectional surveys. However, to test its causal assumptions, experimental and longitudinal designs are most suitable. In the remainder of this article, we offer some suggestions for researchers who decide to use the DSMM as a theoretical framework.

Measuring media use

One of most important challenges in media-effects research is to measure media use reliably and validly, and with the abundance of media and with media-multitasking this will only become more difficult. In nonexperimental research, media diaries are usually considered the gold standard for measuring media use, but they are expensive and time-consuming. Fortunately, various validation studies have shown that the assessment of media use in media diaries converges with self-report measures of media use in surveys (for a recent review, see Fikkers, Valkenburg, & Vossen, 2012).

Media response states

Media response states have predominantly been measured in observational and experimental settings. Several measurement methods have been employed including observations, self-reports, think-aloud procedures (thoughts reported while using media), thought-listings (retrospective reports of thoughts), and psychophysiological

measures (for a review, see Potter & Bolls, 2012). Measuring media response states in survey research is more challenging. It can be realized by experience sampling methods, in which respondents are asked to report their thoughts and feelings while using media. Experience sampling methods can also be implemented in media diaries, in which respondents are first asked which media they have used on specific hours, after which they are asked to remember how they were cognitively, affectively, and physiologically affected by the media content or technology. A method to measure arousal and emotions through self-reports is the nonverbal pictorial Self-Assessment Mannekin (SAM) developed by Bradley and Lang (1994), which has been found valid for adults, but also for children as of 7 years.

Measuring nonmedia variables

The DSMM requires the measurement of three types of nonmedia variables: dispositional, social, and developmental. In experiments in which media exposure is the treatment variable, the measurement of nonmedia variables could be realized by including one or more additional “quasi-independent” variables that measure disposition, cognitive level, or perceived social factors that are hypothesized to interact with the treatment variable. Unfortunately, many existing survey measures of nonmedia variables are too long to be included in surveys next to other media and nonmedia variables. Researchers have, therefore, increasingly tried to shorten existing measures (e.g., need for cognition, trait aggression, parenting, empathy), albeit sometimes not in a programmatic way. Future researchers should continue these efforts, and share the psychometric results of these scales with one another, so that we can improve consensus about the best short versions of these scales.

Conclusion

The DSMM may help future media-effects researchers to reveal how and why specific types of media affect certain individuals; why some individuals are particularly susceptible to media effects; and how this susceptibility is enhanced or reduced. This knowledge is important for parents, but also for program makers, health professionals, and policy makers. Only if we know which, when, how, and why individuals may be influenced by certain types of media will we be able to adequately target prevention and intervention strategies at them. Future research should not only focus on individuals who are particularly susceptible to positive and negative media effects but also on those who are not, because this group may just be as informative to future research as those who are susceptible to media influences. Only by investigating differences between the “susceptibles” and the “insusceptibles” will we better understand the size and nature of microlevel media effects.

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