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# Media Effects: Theory and Research

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Annu. Rev. Psychol. 2016. 67:315–38

First published online as a Review in Advance on August 19, 2015

The *Annual Review of Psychology* is online at psych.annualreviews.org

This article's doi: 10.1146/annurev-psych-122414-033608

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## Keywords

media effects theory, selective exposure, media violence, computer-mediated communication (CMC), mass communication, mass media, meta-analysis

## Abstract

This review analyzes trends and commonalities among prominent theories of media effects. On the basis of exemplary meta-analyses of media effects and bibliometric studies of well-cited theories, we identify and discuss five features of media effects theories as well as their empirical support. Each of these features specifies the conditions under which media may produce effects on certain types of individuals. Our review ends with a discussion of media effects in newer media environments. This includes theories of computer-mediated communication, the development of which appears to share a similar pattern of reformulation from unidirectional, receiver-oriented views, to theories that recognize the transactional nature of communication. We conclude by outlining challenges and promising avenues for future research.

## Contents




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## INTRODUCTION

Research on the effects of media originated under the umbrella term "mass communication research." The last five reviews on the effects of media that appeared in the *Annual Review of Psychology* include the word "mass" in their titles (Liebert & Schwartzberg 1977, Roberts & Bachen 1981, Schramm 1962, Tannenbaum & Greenberg 1968, Weiss 1971). The concept of mass communication arose during the 1920s as a response to new opportunities to reach large audiences via the mass media: newspapers, radio, and film (McQuail 2010). However, "mass" refers not only to the size of the audience that mass media reach, but also to uniform consumption, uniform impacts, and anonymity, notions that are progressively incompatible with contemporary media use.

Since the 1980s, media use has become increasingly individualized and, with the advent of the Internet, has also taken a decidedly personalized character. This increase in individualization and personalization of media use has enabled a form of communication that Castells (2007) has called mass self-communication. Mass self-communication shares with mass communication the notions that messages are transmitted to potentially large audiences and that the reception of media content is self-selected: Media users select media content to serve their own needs, regardless of whether those needs match the intent of the generator of the content (McQuail 2010). However, whereas mass communication research focuses only on media reception processes, mass self-communication focuses on media reception and generation processes and, thus, on the effects of media generation on the generators themselves (Castells 2007).

The current coexistence of mass communication (e.g., via newspapers, radio, and television) with mass self-communication (e.g., via social media) is reflected in the structure and content of this article. The aim of this review is to assess the most important media effects theories that have emerged in the past four decades and to chart the development of media effects thinking from its roots in assumptions about unidirectional effects to contemporary recognition of complex reciprocal interactions. To do so, we do not aim to discuss each of the theories of media effects that has emerged successively. Instead, we start with a brief overview of approaches and their summary by way of several exemplary meta-analyses of media effects. We then organize our review around five important features of media effects theories, including their analytic implications

**Media use:** the intended or incidental selection of media types (e.g., TV, video games, the Internet), content (e.g., entertainment, advertising, news), and technologies (e.g., social media)

**Media effects:** the deliberate and nondeliberate short- and long-term within-person changes in cognitions (including beliefs), emotions, attitudes, and behavior that result from media use

and empirical support. Subsequently, we describe the effects of mass self-communication in the newer media environment. We briefly discuss the historical development of theories of computer-mediated communication (CMC), including the state of present-day CMC theories and research. We conclude by outlining challenges and promising avenues for future research.

## Meta-Analyses of Media Effects

Research on the effects of media emerged between the 1920s and 1930s, but it became a prominent focus only at the end of the 1950s, after the introduction of television and the emergence of academic communication departments in Europe and the United States (but see Hovland et al. 1953, Katz & Lazarsfeld 1955, Lazarsfeld et al. 1948). These developments generated a proliferation of media effects theories and research, albeit initially—as in other social science disciplines—at a fairly basic level. By the 1980s, thousands of empirical studies had been published investigating the cognitive, emotional, attitudinal, and behavioral effects of media on children and adults (Potter 2012, Potter & Riddle 2007). Moreover, since the 1990s, a sizeable number of meta-analyses have synthesized the results of these empirical studies. **Table 1** presents a list of 20 examples of meta-analyses on media effects that have appeared in the past two decades. These meta-analyses were selected because together they cover the broad plenitude of media effects that have been investigated since the 1960s, ranging from the effects of exposure to media violence on aggression and of advertising on purchase behavior, to the effects of Internet use on political engagement and of Facebook use on loneliness.

Meta-analyses of media effects have typically yielded small to moderate effect sizes that lie between $r = 0.10$ and $r = 0.20$, with some deviations. For example, as **Table 1** shows, meta-analyses of the effects of violent computer games on aggressive behavior have reported effect sizes of $r = 0.08$ (Ferguson & Kilburn 2009), $r = 0.15$ (Sherry 2001), and $r = 0.19$ (Anderson & Bushman 2001, Anderson et al. 2010). Meta-analyses of the effects of health campaigns on health behavior have yielded effects sizes between $r = 0.04$ and $r = 0.15$ (Snyder et al. 2004), and those of the effects of media use on body dissatisfaction between $r = 0.08$ (Holmstrom 2004) and $r = 0.14$ (Grabe et al. 2008).

Although small to medium effect sizes are common in many disciplines (Valkenburg & Peter 2013b), several researchers have argued that the small media effects reported defy common sense because everyday experience offers many anecdotal examples of strong media effects (e.g., McGuire 1986). For example, even though a recent meta-analysis of studies into the effects of fear-provoking media on children's fright reactions yielded a small to moderate average effect on fear and anxiety ($r = 0.18$; Pearce & Field 2015), severe media-induced emotional reactions around the clinical threshold have been observed in small subgroups of children.

Such discrepancies in results are less contradictory than they seem at first sight. They suggest that there are strong individual differences in susceptibility to media effects. Meta-analyses of media effects typically focus on main effects or group-level moderator effects. As a result, they do not highlight more subtle yet potent individual differences (Pearce & Field 2015). In the past four decades, media effects theories have tried to specify the conditions under which media produce effects on certain individuals. There are several explanations of why media effects are limited when observed in large heterogeneous groups. These explanations are grounded in five specific features of media effects theories. Four of these features were identified earlier by Valkenburg & Peter (2013a), albeit in less detail. This review both complements and extends the Valkenburg & Peter analysis by adding more evidence and seeking parallels between the mass communication and mass self-communication literature.

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**Table 1 Exemplary meta-analyses of media effects**

| Study | Type of media use | Outcome | *r* |
|---|---|---|---|
| 1. Wood et al. (1991) | Media violence | Aggression | 0.13[a] |
| 2. Paik & Comstock (1994) | Media violence | Antisocial behavior | 0.31 |
| 3. Allen et al. (1995) | Exposure to nudity | Aggression | −0.14 |
| | Violent pornography | Aggression | 0.22 |
| 4. Anderson & Bushman (2001) | Video game use | Aggression | 0.19 |
| | | Prosocial behavior | −0.16 |
| 5. Sherry (2001) | Violent video game use | Aggression | 0.15 |
| 6. Snyder et al. (2004) | Health campaigns | Seat belt use | 0.15 |
| | | Alcohol consumption | 0.09 |
| | | Smoking | 0.05 |
| 7. Marshall et al. (2004) | Television viewing | Fatness/physical activity | 0.08/−0.13 |
| | Video game use | Fatness/physical activity | 0.13/−0.14 |
| 8. Mares & Woodard (2005) | Child use of positive media | Positive interaction | 0.24 |
| | | Altruism | 0.37 |
| | | Stereotype reduction | 0.20 |
| 9. Wellman et al. (2006) | Tobacco use in media | Attitudes toward smoking | 0.11[a] |
| | | Smoking initiation | 0.22 |
| 10. Desmond & Garveth (2007) | Exposure to advertising | Brand attitude | 0.15 |
| | | Product selection | 0.15 |
| 11. Barlett et al. (2008) | Media use | Male body esteem | −0.11 |
| | | Male body satisfaction | −0.10 |
| 12. Grabe et al. (2008) | Media use | Body satisfaction | −0.14 |
| | | Internalization of thin ideal | −0.19 |
| | | Eating behaviors/beliefs | −0.15 |
| 13. Savage & Yancey (2008) | Media violence/panel studies | Criminal aggression | 0.12 |
| | Media violence/experiment studies | Criminal aggression | 0.06 |
| 14. Ferguson & Kilburn (2009) | Media violence | Aggression | 0.08 |
| 15. Boulianne (2009) | Internet use | Political engagement | 0.07 |
| | Online news use | Political engagement | 0.13 |
| 16. Anderson et al. (2010) | Video games | Aggression | 0.19 |
| 17. Powers et al. (2013) | Video games (quasi/true experiments) | Spatial imagery | 0.13/0.21[a] |
| | | Executive function | 0.21/0.08 |
| 18. Nikkelen et al. (2014) | Media use/media violence | ADHD-related behaviors | 0.12/0.12 |
| 19. Song et al. (2014) | Facebook use | Loneliness | 0.17 |
| 20. Pearce & Field (2015) | Exposure to scary television | Fear/anxiety | 0.18 |

[a]Differing effect sizes (e.g., odds ratio, Cohen's *d*) were transformed to correlations (*r*).
Abbreviation: ADHD, attention-deficit/hyperactivity disorder.

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## FIVE FEATURES OF MEDIA EFFECTS THEORIES

The focus of this review is on micro-level media effects theories. Several bibliographic analyses have tried to document the state of the art of both micro- and macro-level media effects theories in the scholarly journals (Bryant & Miron 2004, Potter 2012, Potter & Riddle 2007). **Table 2** lists the micro-level media effects theories that have been identified as particularly well cited in these bibliographic studies. Valkenburg & Peter (2013a) have recently attempted to organize existing

**Table 2 Well-cited micro-level media effects theories**

| Author(s) | Theory/model | Times cited[a] | Description |
|---|---|---|---|
| Lazarsfeld et al. (1948)<br>Katz and Lazarsfeld (1955) | Two-step flow theory | 6,161<br>4,789 | Argues that media effects are indirect rather than direct and established through the personal influence of opinion leaders |
| Tichenor et al. (1970) | Knowledge gap theory | 1,413 | Discusses how mass media can increase the gap in knowledge between those of higher and lower socioeconomic status |
| McCombs & Shaw (1972) | Agenda-setting theory | 6,390 | Describes how news media can influence the salience of topics on the public agenda |
| Katz et al. (1973)<br>Rosengren (1974) | Uses-and-gratifications theory | 901<br>481 | Attempts to understand why and how people actively seek out specific media to satisfy specific needs |
| Gerbner et al. (1980) | Cultivation theory | 1,297 | Argues that the more time people spend "living" in the television world, the more likely they are to believe the social reality portrayed on television |
| Berkowitz (1984) | Priming theory | 677 | Argues that media effects depend on the preconceptions that are already stored in human memory |
| Petty & Cacioppo (1986) | Elaboration likelihood model | 5,086 | Explains how mediated stimuli are processed (via either the central or peripheral route) and how this processing influences attitude formation or change |
| Entman (1993)<br>Scheufele (1999) | Framing<br>Framing as a theory of media effects | 6,597<br>2,196 | Discusses how the media draw attention to certain topics and place them within a field of meaning (i.e., frame), which in turn influences audience perceptions |
| Lang (2000) | Limited-capacity model | 884 | Analyzes how people's limited capacity for information processing affects their memory of, and engagement with, mediated messages |
| Bandura (2002) | Social cognitive theory of mass communication | 1,360 | Analyzes the psychological mechanisms through which symbolic communication through mass media influences human thought, affect, and behavior |
| Slater (2007)[b] | Reinforcing spiral theory | 234 | Argues that factors close to one's identity act as both a predictor and an outcome of media use |

[a]Citations in Google Scholar (April 2015).
[b]Slater's (2007) theory did not show up as a well-cited theory in the bibliographic studies of Bryant & Miron (2004), Potter (2012), and Potter & Riddle (2007), but its citations increased considerably after those publications appeared.

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micro-level media effects theories in terms of their basic assumptions. They observed that these theories differ substantially in how they conceptualize the media effects process. Some theories, particularly the earlier ones, focus primarily on unidirectional linear relationships between media use and certain outcomes (e.g., cultivation theory; Gerbner et al. 1980). Other, more comprehensive theories (e.g., Bandura 2009, Slater 2007) pay more attention to the interaction between media factors (media use, media processing) and nonmedia factors (e.g., disposition, social context). The existing media effects theories can be organized along the following five global features that address the relationships between both media factors and nonmedia factors and specify the boundary conditions of media effects.

**Micro-level media effects theories:** theories that base their observations and conclusions on individual media users rather than on groups, institutions, systems, or society at large

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## Feature 1: Selectivity of Media Use

A first feature of media effects theories that specifies the boundary conditions of media effects involves the selectivity paradigm. The two propositions of this paradigm are that (*a*) people only attend to a limited number of messages out of the constellation of messages that can potentially attract their attention, and (*b*) only those messages they select have the potential to influence them (Klapper 1960, Knobloch-Westerwick 2015, Rubin 2009). More than 60 years ago, researchers discovered that people do not randomly attend to media but rather focus on certain messages as a result of specific social or psychological needs or beliefs (Katz & Lazarsfeld 1955). For example, in their classic study of the 1940 US presidential election, Lazarsfeld et al. (1948) suggested that people often seek out political content that reinforces their beliefs while they avoid content that was meant to change their opinions. This insight led the researchers to conclude that the power of media to change attitudes or behavior is limited (Klapper 1960, Lazarsfeld et al. 1948).

The selectivity paradigm, so coined in the 1940s, has been further elaborated into two theoretical perspectives: uses-and-gratifications (Katz et al. 1973, Rosengren 1974, Rubin 2009) and selective exposure theory (Knobloch-Westerwick 2015, Zillmann & Bryant 1985). Both the uses-and-gratifications and selective exposure theory postulate that individuals select media in response to their needs or desires and that a variety of psychological and social factors guide and filter this selection. Both theories also propose that media use is a precursor to consequences (named obtained gratifications in uses-and-gratifications theory and media effects in selective exposure theory). An important difference between the two theories is that uses-and-gratifications theory conceptualizes media users as rational and aware of their selection motives, whereas selective exposure theory argues that media users are often not aware of, or at least not fully aware of, their selection motives. This difference in conceptualization of the media user has methodological consequences. For example, in line with the assumption that users can articulate their motives for using media, research based on the uses-and-gratifications theory mainly uses self-reports to gauge media use behavior. In contrast, research based on selective exposure theory typically uses unobtrusive observational methods of users' selective exposure to media (Knobloch-Westerwick 2015).

The selectivity approach emerged in the 1940s as a new paradigm that aimed to show that it is more relevant to investigate "what people do with the media" than "what media do to people" (Katz 1959, p. 2). Most of the early studies within this new paradigm conceptualized media use as the outcome; postexposure processes received less attention. In the past decade, however, the selectivity paradigm has become an integrated part of general media effects theories (e.g., social cognitive theory, Bandura 2009; conditional model of political communication effects, McLeod et al. 2009; reinforcing spiral model, Slater 2007; differential susceptibility to media effects model, Valkenburg & Peter 2013a). For the most part, these theories conceptualize media use as a mediator between antecedents and consequences of media effects. In other words, not the media but rather the media user is the center point in a process that may bring about a change, the media effect. This insight has important implications for media effects research. It means that individuals, by shaping their own selective media use (deliberately or not), also partly shape their own media effects. According to Valkenburg & Peter (2013a), three factors influence selective media use: dispositional, developmental, and social context factors.

**Dispositional factors.** Dispositions that may lead to selective media use range from more distal and stable factors (e.g., temperament, personality, gender) to more proximal and transient ones (e.g., beliefs, motivations, moods). Distal dispositions such as sensation seeking and trait aggression have been linked to watching violent, sexual, and frightening media; psychoticism (characterized by impulsiveness and nonconformism) to attraction to horror films; and need for

cognition to exposure to various mainstream types of news (for reviews, see Knobloch-Westerwick 2006, Krcmar 2009, Oliver & Krakowiak 2009). Finally, women are more likely to watch soap operas, drama, and romance than men are, whereas men are more likely to select sports, horror, and action-adventure than females are (for more evidence, see Knobloch-Westerwick 2015, Oliver et al. 2006, Oliver & Krakowiak 2009).

The evidence of the effects of proximal dispositions on selective exposure is more complex. Since the work of Lazarsfeld et al. (1948) and Klapper (1960), the selectivity paradigm has predominantly been inspired by Festinger's (1957) cognitive dissonance theory, which argues that people typically avoid discomforting cognitive dissonance caused by information that is incompatible with their existing dispositions (e.g., beliefs, attitudes). To avoid or solve this state of dissonance, they may actively seek information that reinforces their dispositions, and they avoid potentially contradictory information that would exacerbate dissonance. However, although there is ample evidence for the notion that individuals seek congenial information (Hart et al. 2009), cognitive dissonance reduction is not as consistent a cause of selective exposure as it was previously assumed to be (Donsbach 2009, Hart et al. 2009, Smith et al. 2007). First, the seeking of congenial information seems to hold more consistently for political than for health messages (Hart et al. 2009, Knobloch-Westerwick 2015). Second, subsequent evidence showed that under specific conditions, people are willing or even eager to attend to uncongenial information, for example, when the perceived utility of information is great, when they are uncommitted to an attitude, or when the reliability of the offered information turns out to be poor (Hart et al. 2009).

In the realm of media entertainment, counterintuitive findings also challenged the consistency assumption. For example, when it comes to fearful and tragic entertainment, people often expose themselves to content that is inconsistent with their moods and existing values and that may even elicit uncomfortable reactions, such as fear and sadness. Several more recent theories have proposed plausible explanations for people's occasional attitude-inconsistent selective exposure to information and entertainment, for example, information-utility theory (Atkin 1973), mood management theory (Zillmann & Bryant 1985), and eudaimonia theory (Oliver 2008).

**Developmental factors.** As for development, research has shown that individuals typically prefer media content that is only moderately discrepant from their age-related comprehension schemata and experiences (e.g., Valkenburg & Cantor 2001). If they encounter media content that is too discrepant, they will allocate less attention to it or avoid it. This moderate-discrepancy hypothesis explains, for example, why (*a*) toddlers are mostly attracted to media with a slow pace, familiar contexts, and simple characters; (*b*) preschoolers typically choose a faster pace, more adventurous contexts, and more sophisticated characters; and (*c*) adolescents are the most avid users of social media and seek entertainment that presents humor based on taboos and irreverent or risky behavior (Valkenburg & Peter 2013a). Although developmentally related media preferences are most evident in childhood, they also extend to adulthood. For example, in comparison to younger adults, middle-aged and older adults more strongly prefer nonarousing, meaningful, and uplifting media content, whereas younger adults more strongly prefer arousing, violent, and frightening media (Mares et al. 2008, Mares & Sun 2010, Mares & Woodard 2006).

**Social context factors.** Most media effects theories recognize the importance of social context at the micro, meso, and macro level in encouraging or discouraging media use (Klapper 1960, Prior 2005, Slater 2007). Social influences can occur deliberately and overtly, when institutions, schools, or parents restrict or regulate media use (Nathanson 2001, Webster 2009). On the macro level, structural aspects of the media system (e.g., channel availability) can affect media choices

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(Webster 2009), whereas on the micro level, adults can forbid children to watch violent content and encourage them to use educational media (Nathanson 2001).

Social influences can also occur more covertly, through an individual's perception of the prevailing norms in the groups to which they belong (e.g., family, peer clique, subcultures). This more subtle influence has received relatively little attention in the literature. The majority of research has focused on individual antecedents of media use, thereby ignoring the notion that selective media use also operates on the level of social identity (Harwood 1999), the part of our self-concept that we derive from our membership in a social group or groups (Taifel 1978). Selective exposure is most likely to occur when it is perceived to converge with the opinions, values, and norms in the social group(s) to which media users perceive themselves to belong.

People have a strong need to identify with group norms and to bolster their self-esteem by comparing their social identity to the norms and attitudes of relevant outgroups (Taifel & Turner 1979). Media offer individuals many opportunities to develop and maintain their social identities. They can use media to learn about ingroups and outgroups (e.g., age groups, ethnic groups; Harwood 1999). For example, adolescents often watch drama to learn social lessons about how people like themselves flirt or start and end relationships or which types of humor are appropriate (Valkenburg 2014). Hence, it is likely that media provide media users with "social identity gratifications" (Blumler 1985, Harwood 1999).

## Feature 2: Media Properties as Predictors

A second feature of media effects theories that may specify the boundary conditions of media effects involves properties of media themselves. Three types of media properties may influence media effects: modality (e.g., text, auditory, visual, audiovisual), content properties (e.g., violence, fearfulness, type of character, argument strength), and structural properties (e.g., special effects, pace, visual surprises).

**Modality.** Since the early days of mass communication research, it has been common to study the differential effectiveness of modalities for information processing and learning. Marshall McLuhan (1964) is best known for his theory of the differential impact of modalities. By means of his aphorism, "The medium is the message," he argued that media affect individuals and society not by the content delivered but primarily by their modalities. Inspired by McLuhan's theories, a myriad of media comparison studies have tested whether information delivered via auditory or textual modalities encouraged learning, reading skills, or imagination more (or less) than information delivered through audiovisual media (e.g., Beentjes & van der Voort 1988, Greenfield et al. 1986). These media comparison studies largely lost their appeal in the new millennium, probably because they often failed to produce convincing results, especially when it comes to learning (Clark 2012). Many content and structural properties related to the presentation of information (e.g., difficulty, repetition, prompting) turned out to be more important for learning and information processing than modality (Clark 2012).

Due to advances in technology, in the new millennium research interest in the differential effects of media modalities has shifted to, for example, a comparison of the effects of interfaces that differ in their degree of interactivity on engagement, information processing, and learning (Sundar et al. 2015). Media comparison studies also started to focus on the differential effects of reading on paper versus screens (via tablets or e-readers) for learning and information processing (e.g., Mangen et al. 2013, Small et al. 2009). This rapidly growing literature has to date yielded small and inconsistent differences in favor of reading on paper (cf. Mangen et al. 2013, Rockinson-Szapkiw et al. 2013).



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**Content properties.** The contribution of media content to guide selective exposure or to predict media effects has received relatively little attention on both the theoretical and the empirical levels. For example, in an edited book about selective exposure (Hartmann 2009), not a single chapter focused on specific media content that may trigger or enhance the likelihood of selective exposure. Likewise, a comprehensive edited volume on media effects contained no integrating theory on how media content may enhance or constrain media effects (Bryant & Oliver 2009). Although related fields (e.g., cinematography, advertising) have paid more attention to content properties that may attract attention or enhance effects (e.g., Boerman et al. 2011), media effects researchers typically assess the effectiveness of media content/messages from the psychological reactions they elicit (O'Keefe 2003, Slater et al. 2015). For example, in experiments investigating the differential effects of fear-provoking messages, the extent of fearfulness is typically evaluated via pretests or manipulation checks in which subjects' reactions are observed or surveyed (O'Keefe 2003). Such an effect-based approach, however, offers little understanding of the specific content/message properties that have evoked these states in media users.

The complexity faced in formulating a comprehensive theory of content properties that guide selective exposure is particularly challenging because the attractiveness and effectiveness of content are strongly contingent upon individual users or, at best, subtypes of users. After all, what keeps one's attention on media content is the result of a complex and intertwined set of dispositional, developmental, and social context factors. For example, the nature of characters, narratives, contexts, and humor that attract the attention of early adolescents may be unappealing or even distasteful to other age groups. Still, the literature reveals some notions about media content that may guide selective exposure. For example, it has often been found that people pay more attention to negative media content than to positive content, especially when it comes to news (Zillmann et al. 2004). These results are consistent with theories that argue that people are hardwired for attention to danger-conveying stimuli (Shoemaker 1996). People attach more weight to negative information because such information probably contrasts with their baseline positive reactions to social information (Fiske 2002), a phenomenon named the Pollyanna effect (Matlin & Stang 1978). Pratto & John's (1991) work on automatic vigilance, the human tendency to automatically direct more attention to negative than positive stimuli, has sometimes been used to explain individuals' selective exposure to negative news or to sad and frightening entertainment (Knobloch-Westerwick 2015).

Several different media effects theories have proposed content properties that may enhance media effects. For example, Bandura's (2009) social cognitive theory postulates that media depictions of rewarded behavior and attractive media characters enhance the likelihood of media effects. Priming theory (Berkowitz & Powers 1979) predicts that justified violence (i.e., violence portrayed as morally correct) enhances the likelihood of aggressive outcomes. Transportation theory (Green & Brock 2000, Green et al. 2004) and the extended elaboration likelihood model (Slater & Rouner 2002) propose that media messages embedded in engaging narratives lead to increased media effects. And the elaboration likelihood model (Petty & Cacioppo 1986) predicts that argument strength and/or the attractiveness and credibility of the source can enhance persuasive effects. However, despite these scattered attempts, an overarching theory of content properties that may either guide selective exposure or moderate media effects is still largely lacking. What Swanson (1987) observed about uses-and-gratifications theory still holds for the role of content properties in media effects research: "It remains essentially a conception of the audience's mass communication experience in which the role and importance of message content are not well understood" (p. 245).

**Structural properties.** Research has also identified structural properties of media (e.g., visual surprises, special effects, peculiar sounds) that may trigger our orienting reflex to media; this reflex

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has been argued to instigate selective exposure (Knobloch-Westerwick 2015). The orienting reflex is our immediate and automatic response to change in our environment, such as a bright flash of light or a sudden noise. It is accompanied by an attentional process that has been called stimulus-driven or transient attention (e.g., Corbetta & Shulman 2002). This type of attention contrasts with goal-directed or sustained attention, which is not driven by stimulus properties but rather is directed by the goals and experiences of the media user him- or herself.

Stimulus-driven automatic attention is already present in infants and is less contingent on audience factors than sustained attention is (Bradley 2009, Valkenburg & Vroone 2004). However, although stimulus-driven automatic attention can instigate selective exposure, it is unlikely a sufficient condition for sustained selective exposure. First, after repeated exposure to a novel or otherwise salient stimulus, people's attention toward it becomes weaker, even if the stimulus is strong (Bradley 2009). Second, selective exposure is primarily guided by the goals and experiences of media users, and hence it is more sensitive than stimulus-driven attention to dispositional, developmental, and social context differences in the media users.

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## Feature 3: Media Effects Are Indirect

A third feature of many media effects theories that may specify the boundary conditions of media effects is that most media effects are indirect rather than direct (e.g., McLeod et al. 2009, Petty & Cacioppo 1986). An indirect effect is one in which the influence of an independent variable (e.g., media use) on other variables (e.g., outcomes of media use) works via its influence on one or more intervening (mediating) variables. The conceptualization of indirect media effects is important for two reasons. First, intervening variables provide important explanations for how and why media effects occur, and therefore they can be helpful when designing prevention and intervention programs. Second, ignoring indirect effects can lead to a biased estimation of effects sizes in empirical research and thus of meta-analyses (Holbert & Stephenson 2003). After all, it is the combination of direct and indirect effects that makes up the total effect of an independent variable on a dependent variable. Thus, "if an indirect effect does not receive proper attention, the relationship between two variables of concern may not be fully considered" (Raykov & Marcoulides 2012, p. 7).

Media effects theories have identified three types of indirect effects. In the first type, which we discussed in the section about selectivity (Feature 1), media use itself acts as an intervening variable between pre-media-use variables (development, dispositions, and social context factors) and outcome variables. In the second type of indirect effects, the cognitive, emotional, and physiological processes that occur during and shortly after exposure act as mediators. It has often been posited and shown that the way in which individuals process media forms the route to media effects. For example, research based on the elaboration likelihood model (Petty & Cacioppo 1986) has found that attitude change is more enduring when a message leads to a high level of attention and elaboration (i.e., the central route). Anderson & Bushman's (2002) general aggression model predicts indirect effects of exposure to media violence on aggression through three response states: cognition, emotion, and arousal. Finally, experiments based on Zillmann's (1996) excitation-transfer model have demonstrated that residual arousal that results from media-induced sexual excitement can intensify positive (e.g., altruistic) and negative (e.g., anger, aggression) feelings and behavior.

The third type of indirect effects that has been identified conceptualizes postexposure variables that may themselves be dependent variables (e.g., attitudes and beliefs) as mediators of other postexposure variables. Especially in political and health communication, it has repeatedly been found that effects of media use on political and health behavior are mediated by certain beliefs and attitudes (Holbert & Stephenson 2003). For example, recent work in political communication

increasingly conceptualizes the relationship between news media and voting behavior as indirect, mediated through various political beliefs and attitudes (McLeod et al. 2009). In addition, researchers focusing on agenda setting (McCombs & Shaw 1972), a theory that explains how news media influence the salience of topics on the public agenda by enhancing accessibility in the memories of the audience, have recently reconceptualized agenda setting as a mediator between exposure to news and subsequent political beliefs and attitudes (McCombs & Reynolds 2009).

Finally, theories of health communication via media campaigns also turned from direct associations between individuals' exposure to programs and health behavior, as seen in the 1980s, to a focus on indirect effects in the 1990s. The ultimate goal of most research-based health campaigns is to achieve a change in behaviors, such as reducing alcohol intake or quitting smoking (Hornik 2003). In addition, most theory-based health campaigns are grounded in the notion that the more researchers know about the intervening variables (i.e., the underlying mechanisms) between exposure to programs and a given health behavior, the better they can develop an effective campaign or intervention to reinforce or change that behavior (Fishbein & Cappella 2006). In their review of health communication theories, Fishbein & Cappella (2006) identified seven potential intervening variables that are worth considering in health campaigns, including beliefs about and attitudes toward the behavior and perceived norms concerning performance of the behavior. Identifying such variables is essential to understand not only the underlying mechanisms of media effects but also the true magnitude of these effects.

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## Feature 4: Media Effects Are Conditional

Models that propose conditional media effects share the notion that media effects can be enhanced or reduced by individual difference and social context variables. Several media effects theories recognize conditional media effects, including uses-and-gratifications theory (Rubin 2009), reinforcing spiral model (Slater 2007), the conditional model of political communication effects (McLeod et al. 2009), the elaboration likelihood model (Petty & Cacioppo 1986), and the differential susceptibility to media effects model (Valkenburg & Peter 2013a). For example, in the elaboration likelihood model, need for cognition—the tendency to enjoy effortful information processing—is seen as a moderator of media effects on attitudes.

Some theories have proposed that the same factors that can predispose media selection can also modify the direction or strength of the effects of media use (e.g., Bandura 2009, McLeod et al. 2009). Valkenburg & Peter (2013a) argued that dispositional, developmental, and social context factors have a double role in the media effects process: They not only predict media use, but in interaction with media properties they influence the way in which media content is processed. In other words, properties of media affect how media content is processed (i.e., property-driven processing), but the effects of this property-driven processing are contingent upon specific dispositions, developmental level, and social context factors of the media user.

As previously discussed, individuals have the tendency, at least to a certain extent, to seek out congenial media content (Hart et al. 2009, Klapper 1960); that is, content that does not deviate too much from their dispositions and developmental level and the norms that prevail in the social groups to which they belong. It is conceivable that these same factors can also moderate the way in which media content is processed. Qualitative critical audience research has often emphasized that audiences differ in their interpretations of media content (e.g., Hall 1980) and that these interpretations partly depend on gender, class, race, and age (e.g., Kim 2004). However, in social science–based media effects theories, such interactive influences on media processing have, to our knowledge, received less attention. There has been ample research on selective exposure and selective recall but less research on selective reception processes (Hart et al. 2009). Moreover,

the scarce research that is available has mainly focused on cognitive processing of media content and less on emotional processing, despite the growing evidence that emotional processes, such as identification with characters and involvement in the narrative, are important routes to persuasion (e.g., Slater & Rouner 2002).

As for dispositions, research indicates that trait aggressiveness moderates media violence effects on cognitive processing (e.g., misinterpretation of ambiguous nonviolent acts) and emotional processing (e.g., a decreased empathy with characters; Bushman 1995, Krcmar 2009). A high need for cognition has been shown to moderate message effects on cognitive processing (Cacioppo et al. 1996, Shrum 2009). Trait empathy and need for affect can enhance emotional processing when watching sad or frightening films (Krcmar 2009, Oliver & Krakowiak 2009). Finally, bodily needs such as hunger may significantly alter the way in which individuals perceive food products presented on a screen. Such products may seem bigger when subjects are hungry than when they are not (McClelland & Atkinson 1948).

The moderating role of dispositional variables can be explained by the disposition-content congruency hypothesis (Valkenburg & Peter 2013a), which argues that dispositionally congruent media content may be processed faster and more efficiently than incongruent content because it can be assimilated more readily to the media user's existing cognitive schemata. Because congruent content requires less cognitive effort, it leaves more resources available for the processing of less salient content (Alba & Hutchinson 1987). Dispositionally congruent content can also affect emotional processing through processing fluency. Congruent content enhances the media users' experience of familiarity or at least their illusion of familiarity. This (illusion of) familiarity may in turn enhance positive affect and aesthetic pleasure, a process that has been named the hedonistic fluency hypothesis (Reber et al. 2004).

As for the moderating role of developmental level, research shows that, in comparison to older children and adults, younger children are less effective in investing cognitive effort during media use. They still lack the knowledge and experience to assimilate new information into their existing framework. They also show stronger physiological arousal reactions to violent and frightening media, even if this content is unrealistic (Valkenburg & Cantor 2001). Finally, whereas younger adults invest more cognitive effort in processing negative stimuli (e.g., mutilations; Mares et al. 2008), middle and older adults invest more cognitive effort in processing positive stimuli (e.g., babies, animals). As previously discussed, if individuals encounter media content that is too discrepant from these schemata and experiences, they will either avoid it or allocate less attention to it. Moderately discrepant media content, which is, by definition, partly familiar to a media user, is also likely to be processed more fluently. Such content can more easily be related to existing schemata than can fully discrepant content. As a result, it can activate more and more different nodes (e.g., emotions, cognitions) in people's semantic network (Valkenburg & Peter 2013a).

Social contexts can also modify the way in which we perceive media. When physical violence is accepted in families, children may learn to interpret media violence differently than do other children (Schultz et al. 2001), and they may become more susceptible to media effects on aggression (Fikkers et al. 2013). Moderating effects on cognitive and emotional processing also happen more covertly due to emotional contagion (McDonald 2009). Because media users are sensitive to others' attitudes, moods, and emotional reactions, their own cognitive and emotional responses can be intensified or dampened during shared media use. Valkenburg & Peter's (2013a) context-content convergence hypothesis posits that individuals are more susceptible to media messages if these messages converge with the values and norms in the social environment of the media user. In cultivation theory (Gerbner et al. 1980, p. 15), this phenomenon has been named resonance: When something experienced in the media is similar to one's social environment, it creates a double dose of the message, which enhances the likelihood of media effects.



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## Feature 5: Media Effects Are Transactional

A final feature of media effects theories that may specify the boundary conditions of media effects is that such effects are transactional (e.g., Anderson & Bushman 2002, Bandura 2009, Früh & Schönbach 1982, Slater 2007). Transactional theories assume reciprocal causal relationships between characteristics of the media users, their selective media use, factors in their environment, and outcomes of media (Bandura 2009). Transactional theories elaborate on the selectivity paradigm (Feature 1), which assumes that individuals, by selectively exposing themselves to media, in part shape their own media effects. Transactional models aim to explain how and why this occurs. They specify the boundaries of media effects by recognizing that media users can be influenced only by media content that they selectively use and selectively interpret.

Transactional media effects theories are usually quite complex and based on at least three assumptions. First, producers and receivers of media content/messages are connected through communication technologies (e.g., radio, television, Internet) and engage in transactions; that is, they exchange information and values with each other through communication technologies (Bauer 1964). These transactions between producers and receivers imply that communication technologies function as reciprocal mediators between these entities (Früh & Schönbach 1982). Second, both producers and receivers of media content/messages influence each other and, hence, both can change as a result of the media content/messages they produce or receive: Receivers can change as a result of their own selective media choices (see Feature 1) and selective perception processes (see Feature 4); producers can change because they learn from, or cater to, what they perceive to be audience needs and preferences (Webster 2009). Third, transactions can be distinguished as interpersonal, that is, the transactions between producers and receivers, and intrapersonal, that is, the transactions within the cognitive and affective systems of the producers or receivers themselves (cf. Früh & Schönbach 1982). Intrapersonal transactions may, for example, guide selective exposure to, and selective perception of, interpersonal transactions.

Transactional models of media effects see predictive paths both from media use to media outcomes, and from these outcomes to media use. Such paths have been conceptualized as dynamic (Früh & Schönbach 1982) or, more specifically, as a reinforcing spiral (Slater 2007). The depiction of reciprocal media-outcome relationships as a reinforcing spiral may imply a positive or negative feedback loop that ends in extreme media use and extreme levels on outcome variables (Slater 2015). However, transactional models assign a central moderating role to the social environment in which the producers and receivers are embedded. For example, Bandura (2009) assumes that humans have interactive agency, which means that they are neither entirely autonomous from their environment nor completely subject to environmental influences. Influences of media on individuals may therefore initially increase, but as a result of dispositional, developmental, or environmental forces, in time individuals will tend toward homeostasis (Slater 2015).

Transactional media effects have received little research attention. For example, none of the recent meta-analyses on media use and aggression have been able to include effect sizes for reciprocal relationships in their analyses despite the accumulation of longitudinal studies in the field (e.g., see the meta-analyses of Anderson et al. 2010, Ferguson & Kilburn 2009). This even holds for the relationship between media use and ADHD symptoms, which can be integral parts of one's identity and thus likely to predispose media use. Of about 40 empirical studies on the relationship between media use and ADHD symptoms, more than 95% conceptualize media use only as a cause and not as a result of these symptoms (Nikkelen et al. 2014).

However, other studies have pointed to transactional media effects. For example, Slater et al. (2003) found that exposure to violent media prospectively predicted aggressiveness, and aggressiveness prospectively predicted violent media content. Eveland et al. (2003) found that individuals'

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elaboration of television and print news messages was reciprocally related to their level of political knowledge. Such reciprocal relationships have also been found for sensation seeking and watching R-rated movies (Stoolmiller et al. 2010). Finally, adolescents who frequently watch pornography more often tend to see women as sex objects, which in turn increases their use of and emotional responses to this material (Peter & Valkenburg 2009).

## MEDIA EFFECTS IN THE NEWER MEDIA ENVIRONMENT

Theories and research on the effects of individual or group behavior in computer-mediated environments emerged in the 1970s, long before the Internet became widespread. Unlike media effects research, which evolved from the study of mass communication, this strand of theory and research originated as a hybrid of interpersonal communication, teleconferencing, and organizational behavior, with a focus on how computer-mediated communication (CMC) affected interpersonal and group interaction. Theories of CMC have typically focused on discovering, and comparing, the psychological and behavioral effects of face-to-face communication to those of CMC. Alternatively, they studied how communicating online in large-scale networks of strangers differs from proximal interactions with known partners. CMC theories often centered on questions such as whether, and how, certain characteristics of CMC, such as anonymity or the lack of nonverbal (auditory or visual) cues, influence the quality of social interaction and the impressions CMC partners form of one another.

### Computer-Mediated Communication Theories

The first generation of CMC theories, which have retrospectively been named cues-filtered-out theories, tried to compare the "lean" text-only applications such as email and online discussion boards with the presumably richer face-to-face communication (for a review, see Culnan & Markus 1987). They tried to explain why, for example, CMC fosters less socioemotional communication and more shallow impressions of communication partners and why depersonalization and anonymity due to CMC can lead to inhibited behavior, such as flaming. Well-known theories from that period are the media richness theory of Daft & Lengel (1986), the social presence theory of Short et al. (1976), and the lack of social context cues hypothesis of Sproull & Kiesler (1986).

As the Internet became widely adopted for personal use and popular accounts of supportive virtual communities garnered attention, the 1990s saw a new cluster of theories with less restrictive views of CMC. An influential theory from that period is Walther's (1992) social information processing theory, which explains how CMC partners gradually overcome the absence of nonverbal cues online by creatively employing verbal cues and interaction strategies (such as content and style variations and more direct personal questions and answers) to encode and decode social and emotional messages in CMC. In this way, with sufficient time and message exchanges, the level of impression development among communication partners and the intimacy of CMC can become comparable to that of face-to-face communication. An alternative approach, the social identification/deindividuation (SIDE) model, argues that text-only CMC, without physical appearance cues that signal the individual identities of partners, enhances the salience of a social identity at the expense of a personal identity (Postmes et al. 2000). The enhanced categorization of the self and others as members of groups in CMC causes participants to behave according to perceived group norms. As a result, CMC leads to more normative behavior than that of face-to-face groups.

Another influential approach from that period is Walther's (1996) hyperpersonal communication model, with the even more optimistic prediction that text-only messages can lead to more favorable impressions of a CMC partner and more intimacy than does face-to-face



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communication. According to the model, CMC message creation encourages communication partners to present themselves in optimal ways. By exploiting CMC's capacity for greater control over self-presentations, they can carefully craft their self-portrayals more nicely or attractively than they generally do, or are able to, in face-to-face interactions. Recipients of CMC communication, in turn, fill in the blanks in their impressions of their partners that the absence of audiovisual cues leaves open, which encourages them to idealize these partners. According to Walther, CMC can thereby even become hyperpersonal, that is, more intimate than offline communication.

Inspired by Walther's hyperpersonal communication theory, Valkenburg & Peter (2009) developed and tested the Internet-enhanced self-disclosure hypothesis among adolescents. They argued that the Web 2.0 technologies that arose in the new millennium are increasingly designed to encourage communication with existing friends. As a result, much of the time that adolescents spend with such technologies is used to maintain existing friendships, which may eventually enhance the closeness of these friendships. In several of their studies they found that, due to their limited audiovisual cues, social media may lead adolescents to perceive that the Internet provides a safe place to disclose intimate information to their friends. The more adolescents used social media, the more they disclosed themselves online to their friends. This enhanced online self-disclosure, in turn, stimulated the quality of their friendships, albeit only when adolescents used social media to communicate primarily with their existing friends and not when they used it primarily to chat with strangers (Valkenburg & Peter 2009, 2011).

The focus of early CMC theories on anonymity and limited nonverbal cues fit well through 2005, when CMC was predominantly text-based and typically took place in anonymous chat rooms and newsgroups between unacquainted communication partners. However, with the introduction of Web 2.0 applications such as Twitter (2006), Facebook (2006), WhatsApp (2009), and Instagram (2010), online communication has diversified, with many more audiovisual platforms as well as uses within existing relationships. People now actively use a variety of text-based and audiovisual communication channels. These developments have made it more difficult, and sometimes less relevant, to compare specific CMC applications with each other or with face-to-face communication. These changes in technologies call for changes in theories and research.

## Mass Self-Communication and Expression Effects

In Web 2.0–based social applications, information is distributed multidirectionally in a network where audiences can vary from one to many. Importantly, Internet-based social communication enables everyone with an Internet connection to become a sender of information, that is, a content creator and a media source. Given that a considerable proportion of the information distributed via social media is personal and self-related, Castells (2007, p. 248), as discussed previously, has outlined a "new form of socialized communication" that he calls mass self-communication. Like mass communication, mass self-communication can potentially reach a global audience, but "it is self-generated in content, self-directed in emission," and it typically focuses on self-related information (Castells 2007, p. 248).

The concept of mass self-communication has important implications not only for media effects theories but also for CMC theories. Many, especially the older, CMC theories suffer from the same omissions as some older media effects theories. Both types of theories are often rooted in a reception model; that is, in the notion that certain properties of media or technologies (modality, content, structure) have a unidirectional impact on recipients. Even CMC theories, which are ostensibly theories that focus on the communication between two or more individuals, have often focused on the effects of certain CMC properties (i.e., anonymity, reduced nonverbal cues) on the recipients of these properties. Although media effects as well as CMC theories like to describe

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recipients as active in the sense that they have autonomy over the way they receive and interpret media or CMC properties, the assumed influence is unidirectional: from the media or technology to recipients. In fact, in both media effects and CMC theories, "effects" are often conceptualized as recipient effects.

The concept of mass self-communication does not deny the processes related to the reception of media content. However, its emphasis on the self-generated, self-directed, and self-focused character of Internet-based social communication draws our attention to the possible effects of content produced by the sender on him- or herself. Long before the advent of Web 2.0, observers noted that media users had become producers as well as consumers of information and entertainment, a phenomenon for which the now somewhat obsolete term "prosumers" was coined (Toffler 1980). This implies that, in terms of transactional media effects theories, CMC technology provides users not only a fast and easily accessible vehicle for interpersonal transactions, but also an increased opportunity for intrapersonal transactions; that is, transactions within the senders (and recipients) themselves. In other words, the production and distribution of content by a sender may affect not only its recipient(s), but also the sender him- or herself. This phenomenon, that our own behavior exerts influence on ourselves, has been recently referred to as an expression effect (Pingree 2007).

The study of expression effects is rather new in the field of media effects, and research into the mechanisms is still scarce. A plausible explanation for the occurrence of expression effects is based on the same need that guides selective media exposure—the need to be consistent. Bem's (1972) self-perception theory may be useful as a starting point. Like Festinger (1957), Bem suggests that people need to be consistent in their beliefs, attitudes, and behavior. Whereas the generally accepted belief is that cognitions and attitudes precede one's behavior, self-perception theory, in contrast, argues that individuals derive their cognitions, beliefs, and attitudes from their own prior overt behavior. They adapt their beliefs and attitudes by observing their own behavior in retrospect.

Several CMC studies have addressed expression effects. For example, Shah et al. (2005) found that online civic messaging—that is, the creation of political messages on the Internet—significantly influenced the senders' own civic engagement, and often more strongly than exposure to traditional news media. Gonzales & Hancock (2008) asked subjects to present themselves in either a public or private blog as either introverts or extraverts. They found that subjects later perceived themselves according to their introvert or extravert self-presentation, but only when their blogs were public. Such intrapersonal changes even appear to hold when the online self-presentation occurs through an avatar (a digital, graphical character that represents the CMC user in virtual worlds or games), a phenomenon that has been named the Proteus effect (Yee et al. 2009).

Other studies demonstrate ways in which expression and social effects combine. Valkenburg et al. (2006) found that adolescents' own behavior on social network sites is related to their self-esteem. Adolescents who created an online profile seemed to use feedback from their peers about these profiles to adjust and optimize their profiles, which was associated with more positive feedback. In this way, through improved feedback and their own communicative behavior, they managed to enhance their self-esteem. This result was extended by Walther et al. (2011a). Drawing on Gonzales & Hancock (2008), Walther et al. asked subjects to write blogs; half of the subjects were instructed to write as if they were introverts and the other half as extraverts. They showed that when CMC users received confirming feedback (from either a person or a computer program), it magnified the expression effect (i.e., the effect of their self-presentation on their own self-concept).

In summary, the scarce research into CMC research in general and expression effects in particular indicates that both intrapersonal (expression effects) and interpersonal (feedback)

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processes may affect the self-presentation and self-concepts of senders and recipients of mediated communication (Van Der Heide et al. 2013). In addition, both senders and recipients have specific dispositions that may prompt their media consumption, shape their attention to the messages that are exchanged, and affect their interpretation (Walther et al. 2011b). Future research should further explore the exact conditions that facilitate, and mechanisms that explain, expression effects. Future research should also attempt to understand whether and how expression effects occur, and for whom they particularly hold, so that interventions can be designed to mitigate negative effects (e.g., of comments on suicide or proanorexia sites) and encourage positive ones (e.g., comments on websites that encourage civic participation).

## CONCLUSION

In this review, we have taken stock of the development of two subdisciplines of communication science: (mass) media effects and computer-mediated communication (CMC). We charted some notable parallels in conceptual thinking within these subdisciplines. First, both media effects and CMC research have found their roots in theories that conceptualize effects as powerful and direct processes, which have been metaphorically called a hypodermic needle or magic bullet in media effects theories and technological determinism in CMC. Second, in the course of time, both subdisciplines progressed from a unidirectional receiver-oriented view to transactional paradigms. Current theories in both subdisciplines acknowledge that individuals shape and are shaped by their own selective use of media or communication technologies.

Despite this apparent progression in theory formation, research into the uses and effects of the newest generation of communication technologies is still in its infancy. An important factor that hampers the field is that its object of study, media and technology, is a moving target, a phenomenon that is continuously subject to change while we try to understand it. Since the advent of Web 2.0, these changes have rapidly accelerated. The tools and applications that we study are often outdated by the time that articles about them are published. Another factor is that our understanding of the uses and effects of media and communication technologies develop in a variety of disparate disciplines and subdisciplines that until now have often largely ignored each other, which also hampers integrative theory formation and testing (Craig 1999).

An integration of mass media and CMC research is more opportune than ever, now that we spend several hours per day with social media, and mass media communication has turned into mass self-communication. Take a phenomenon such as social TV, the most obvious blending of a mass medium and CMC, in which many people simultaneously share their TV experience with other viewers via Twitter or Facebook and divide their attention between television and the comments of thousands of other viewers. Based on the context-congruence hypothesis, it is to be expected that comments from like-minded coviewers may enhance selective processing of media content and, hence, media effects. However, research on such phenomena is still scarce. There is an obvious need for research that compares the effects of social watching with watching alone and specifies the conditions under which user-generated comments affect viewers.

There are more important technological trends that may influence one or more of the five features of media effects theories identified in this review. First, communication technologies have become ever more mobile. They moved from our desk (desktop), to our bag (laptop), to our pocket (smartphone), which has significantly altered our media use (Feature 1). Not only has the time we spend with communication technologies increased significantly, but also our tendency to media multitask (i.e., the use of TV, radio, print, the Internet, or any other medium in conjunction with another). About 30% of the time adolescents spend with media now consists of

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media multitasking (Rideout et al. 2010). This development has important research implications. How do we, for example, validly measure media use if individuals spend one-third of their media use multitasking (Feature 1)? And how can we still validly estimate the effects of such scattered media use?

Not only may our media use be more selective, another trend is that the media messages we receive are increasingly more selected for us. Personalization of media lies at the core of the "demassification of mass communication" because it further allows media users to select their own media content (Sundar et al. 2015, p. 60). Corporations such as Amazon, Netflix, and Google News increasingly attempt to personalize their content for each user in order to enhance engagement and shorten the distance between their products and website consumers. Personalization occurs through book or movie recommendations or by targeting information and advertising for individual users. Through personalization, corporations attempt to drive selective exposure (Feature 1) and help users find entertainment, information, or brands that they never knew existed but are likely to want. Research on personalization has rapidly emerged in the past few years. Preliminary evidence shows that personalization may increase the cognitive and emotional engagement of media users (Features 2 and 4), and by this route, it can enhance media effects (for an overview, see Sundar et al. 2015). Future research should address the underlying mechanisms and contingent conditions under which personalized media content may exert positive or negative transactional influences.

A final unmistakable trend in communication technologies that may enhance the likelihood of media effects is the increasing lifelike visualization in both mass communication and mass self-communication. Text-only CMC, which was still common around the start of the millennium, has been supplemented or even replaced by visual CMC (e.g., Instagram). Movies increasingly appear in 3D, and we will soon be able to experience virtual reality games or worlds by means of head-mounted devices such as Oculus Rift. Such display devices provide users with a strong degree of sensory richness because they make them think and feel that the environment responds to their actions and that users themselves are the source of changes to their environment (Sundar et al. 2015). Research into virtual reality or immersive virtual environments began in the past millennium, but recent technological advances are moving such technologies out of the research lab into our living room, where they can bring extremely engaging and vivid virtual worlds (Karutz & Bailenson 2015).

Research into the everyday experiences with such technologies is still scarce. Important questions are, for example, how the properties of such technologies may enhance emotional and cognitive involvement with vivid and lifelike characters and narratives (Features 2 and 4). And how may these properties further affect some of the canonical foci of (mass) media effects, such as learning, fear reactions, and aggression? These new developments may demand adjustments or refinements of theories and new ways of thinking. Providing answers to these questions and charting their implications for media effects research will make the task of the next contributors on this topic to the *Annual Review of Psychology* particularly interesting.

## DISCLOSURE STATEMENT

The authors are not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

## ACKNOWLEDGMENTS

This research was supported by a grant to the first author from the European Research Council under the European Union's Seventh Framework Program (FP7/2007–2013)/ERC grant agreement no. AdG09 249488-ENTCHILD.



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Annual Review of Psychology

Volume 67, 2016

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