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A Story about a Stupid Person Can Make You Act Stupid (or Smart): Behavioral Assimilation  
(and Contrast) as Narrative Impact

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### Abstract

Media priming refers to the residual, often unintended consequences of media use on subsequent perceptions, judgments, and behavior. Previous research showed that the media can prime behavior that is in line with the primed traits or concepts (assimilation). However, assimilation is expected to be less likely and priming may even yield reverse effect (contrast) when recipients have a dissimilarity testing mindset. Based on previous research on narrative comprehension and experience as well as research on media priming, a short term influence of stories on cognitive performance is predicted. In an experimental study, participants (N = 81) read a story about a stupid soccer hooligan. As expected, participants who read the story without a special processing instruction performed worse in a knowledge test than a control group who read an unrelated text. Participants with a reading goal instruction to find dissimilarities between the self and the main protagonist performed better than participants who read the story without this instruction. The effects of reported self-activation and story length were further considered. Future inquiries with narratives as primes and contrast effects in media effects research are discussed.

*Keywords:* media priming, narratives, knowledge, cognitive performance, active self

A Story about a Stupid Person Can Make You Act Stupid (or Smart): Behavioral Assimilation  
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Since the early 20<sup>th</sup> century social scientists have conducted research on the consequences of media use, and since the 1980s *media priming* belongs to the major concepts used to describe and explain the influence of media use on subsequent judgments and behavior (Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2009). Research on *priming* is concerned with the residual, often unintended consequences of some stimulus or event on subsequent perceptions, judgments, and behaviors (Bargh & Chartrand, 2000). The concept of media priming applies when the initial priming event is some kind of media use (for overviews: Roskos-Ewoldsen, Klinger, & Roskos-Ewoldsen, 2007; Roskos-Ewoldsen et al., 2009; Roskos-Ewoldsen & Roskos-Ewoldsen, 2009; see also Peter, 2002; Scheufele & Tewksbury, 2007). Effects of priming are supposed to be rather short-lived, they are expected to increase with the intensity of the prime, and with the ambiguity of the target (Roskos-Ewoldsen, et al., 2009; Roskos-Ewoldsen & Roskos-Ewoldsen, 2009). Recent overviews on media priming identified three major lines of research (e.g., Roskos-Ewoldsen et al., 2009; Roskos-Ewoldsen & Roskos-Ewoldsen, 2009), studies on media stereotypes and their influence on judgments regarding members of the stereotyped group depicted (e.g., Dixon, 2006; Ford, 1997; Hansen & Hansen, 1988; Oliver & Fonash, 2002), research on political news coverage and its impact on evaluations of politicians (e.g., Iyengar, Kinder, Peters & Krosnick, 1984; Krosnick & Kinder, 1990), and studies on media violence and aggressive thoughts and behavior (e.g., Anderson & Bushman, 2002; Berkowitz, 1984).

The present paper extends the scope of media priming to the influence of stories or narratives on cognitive performance. In addition to the media priming literature, the work

presented here is influenced by theory and research from social psychology, particularly research that examined the role of the active self in priming and research which examined priming effects on participants' knowledge test performance. In one seminal study Dijksterhuis and van Knippenberg (1998) had their participants reflect on the traits 'intelligent' or 'stupid' or related categories, i.e., a typical professor or a typical soccer hooligan. Subsequently, the participants were requested to answer a set of general knowledge items. Compared to control groups, priming trait intelligence or priming the professor stereotype led to a performance increase; priming trait stupidity or priming the hooligan stereotype led to a performance decrement in the subsequent knowledge test. However, under certain conditions the priming procedure yielded reverse results: Priming *Albert Einstein* led to poorer test results, priming *Claudia Schiffer* (a then-famous fashion model) led to better results on a general knowledge test (Dijksterhuis, Spears, et al., 1998).<sup>1</sup>

To date, there is substantial evidence that the media can initiate priming effects. The psychological mechanisms responsible for these effects, however, are less clear (Roskos-Ewoldsen et al., 2009). Existing theories on media priming such as the General Aggression Model (Anderson & Bushman, 2002) concentrate on one specific line of research and may not be applicable to media priming in general terms. Moreover, most theory and research on media priming has focused exclusively on assimilation effects, i.e., judgment and behavior that become more similar to the prime (Wheeler & Petty, 2001). However, features of the prime (e.g., Dijksterhuis, Spears et al., 1998) as well as features of the recipient may make assimilation unlikely and may even yield contrast effects i.e., behavioral consequences that are opposite to the prime.

This paper will introduce theories from social psychology that are frequently used to explain priming to behavior effects. Given the active role of the self in the comprehension and

experience of stories, two theoretical frameworks that focus on the active self receive particular attention. The general aim of this paper is to connect these theories to media priming and to test resulting predictions regarding the influence of stories on cognitive performance. To this end an experiment is presented that deals with the effects of a narrative prime on the performance in a test of general knowledge. Situated in this original field of media priming research, one specific goal is to investigate the influence of recipients' mindsets on media priming effects to occur. This includes the possibility of contrast effects, i.e., behavior that is opposite to the prime. Moreover, the aim of the present study is to examine the role of self-activation in media priming under different mindsets, which are operationalized through different processing goals. Due to fact that previous findings regarding the intensity or dosage (Miller & Krosnick, 1996) of a media prime were somewhat inconclusive, story length was included as an additional variable of interest.

*The perception-behavior-link and the comprehension and experience of stories*

An early framework that is frequently used to explain priming effects on behavior is the *ideomotor account* (e.g., Dijksterhuis & van Knippenberg, 1998; Dijksterhuis & Bargh, 2001). Scholars of the 19<sup>th</sup> century postulated that ideation about an action is sufficient to trigger that action (Carpenter, 1852; James, 1890, see Stock & Stock, 2004, for an overview). Indeed, empirical research found that imagining oneself to fall forwards initiated forward movements (Hull, 1933). Similarly, individuals who observe some other person's behavior tend to automatically imitate that behavior, which was demonstrated in different domains, such as facial expressions, movements and gestures, and voice and speech. These early accounts were picked up by social psychologists who emphasized the direct link between perception and action (*perception-behavior-link*, Dijksterhuis & Bargh, 2001). They assume that humans – like other species – are hard-wired to automatically imitate behavior (Dijksterhuis & Bargh, 2001, p. 28). However, individuals' tendency to imitate can be inhibited, a key difference to the behavior of

non-human species. Although intelligent behavior cannot be observed directly, priming of intelligent behavior was explained in terms of the perception-behavior-link (Dijksterhuis & van Knippenberg, 1998; Dijksterhuis & Bargh, 2001). It was assumed that the activation of trait intelligence (by directly priming the trait or by priming the professor stereotype) activated higher-order concepts which in turn stimulated hierarchically subordinate behavioral representations (e.g., to concentrate) that increase performance. Given the direct, unmediated association between perception and behavior, there is little room for individual differences in the responses to the priming stimulus (Wheeler, DeMarree, & Petty, 2007). The automatic perception-behavior-link may be an adequate model for much of the behavioral priming effects observed in the lab or in everyday life. A recipient's behavior such as yawning, for example, may directly mirror the behavior of a media character observed on the screen (Dijksterhuis & Bargh, 2001). However, the perception-behavior-link may not be sufficient to explain priming effects when more complex media stimuli such as narratives are considered (see Roskos-Ewoldsen et al., 2009 for a similar conclusion regarding network models of memory).

Theory and research on media comprehension suggest that there are important processes that mediate any link between some media stimuli and potential influences. According to this line of research, recipients actively construct a representation of the events described in written or audiovisual texts (Busselle & Bilandzic, 2008; 2009; Gerrig, 1993; Zwaan & Radvansky, 1998). These representations of events have been introduced as *situation models* (van Dijk & Kintsch, 1983) or *mental models* (Johnson-Laird, 1983) and go beyond a mere copy of the text's information. The recipient is active and "becomes the writer of his or her own version of the story" (Oatley, 2002, p. 43). Narratives require the recipient to use his or her own knowledge to infer meaning in order to comprehend the text (Eco, 1994). Inferring information enables the recipient to build a dynamic mental representation of a situation, an event, or an object.

Moreover, a recipient is required to locate him or herself within the mental model of the story in order to comprehend the narrative (Busselle & Bilandzic, 2008; 2009). Recipients adopt a cognitive standpoint within the narrative world and interpret the text from this perspective (e.g., Gerrig, 1993; Gerrig & Jacovina, 2009; Segal, 1995).

*Active self and the selective accessibility of self-relevant content in priming*

Due to the interaction between recipient and media product in story comprehension, theories that emphasize the role of the self in priming-to-behavior-effects may be better able to explain priming effects of stories or narratives than the direct perception-behavior-link. The active-self account (Wheeler, DeMarree, & Petty, 2005; 2007) is based on the distinction between an active self-concept and a chronic self-concept. The chronic self-concept represents aspects of the self that are stored in long-term memory, it is relatively stable, and it may not be affected by a single priming episode. Thus, a story about a stupid soccer hooligan is not supposed to change the reader's permanent competence self-concept, as psychological priming effects are considered to be short-term (Roskos-Ewoldsen et al., 2009).<sup>2</sup> The active self-concept (e.g., activated self-knowledge, goals or beliefs), determines an individual's behavior and this part of the self-concept is susceptible to priming influences. The active self-concept can have a great overlap with the chronic self-concept. However, situational influences such as primed constructs ("stupidity") may influence the active self and hence, affect behavior, even if these inputs (a stupid soccer hooligan) have little or no overlap with the chronic self-concept. Primed stimuli can activate certain parts of the chronic self-concept but also concepts that are not part of the chronic self can be activated and misattributed as aspects of the chronic self (Wheeler et al., 2007). The notion of the active self implies that primed traits and concepts need to be connected to the self in order to affect behavior. Under this perspective, primes do not affect behavior unless they influence the active self-concept (e.g., "I am too stupid to answer these difficult questions").

As noted earlier, primes can have reverse effects. Primes can not only activate self-related content that is consistent with the prime – primes can activate self-inconsistent concepts (e.g., “stupidity”) that are not related to the self and at the same time activate concepts that are self-relevant but opposite to the prime (“I am smart”). Due to the notion that self-related content affects behavior, priming can therefore result in behavior that is in line with the priming stimulus (assimilation) but also result in behavior that is opposite to the priming stimulus (contrast, cf. Wheeler & Petty, 2001). The distinction between processes that lead to assimilation and processes that lead to contrast effects are represented as a bifurcation in the selective accessibility model (Mussweiler, 2003; 2007). Its main focus is on comparison processes in light of salient exemplar primes. According to this model, people initially engage in a holistic assessment of target-standard similarity when exposed to a distinct stimulus prime. The prime is judged to be a point of reference or an interpretive frame. If the prime is judged dissimilar from the self (e.g., “I am no Einstein”) *dissimilarity-testing* follows: People tend to consider information *inconsistent* with the prime. If the prime is judged sufficiently similar to the self (e.g., “I go to college, like a professor does, somehow”) *similarity-testing* follows: People tend to consider information consistent with the prime. Once the processing mode is established, the amount of the self activation contributes to either assimilation or contrast. As a result, high levels self-activation should promote prime-consistent behavior in the similarity-testing mode, but should promote prime-inconsistent behavior when recipients engage in dissimilarity testing. Thus, in an experimental setting, differences between conditions that do or do not induce dissimilarity testing should be most pronounced for participants with high levels of self-activation. But which factors makes a person engage in one of the two hypothesis-testing mechanisms and not the other?

Most studies on priming-to-behavior effects have examined the stimulus side. Exemplars that are strongly associated with specific traits or attributes are more likely to yield contrast than

when those characteristics are primed without a distinctive exemplar. Especially when such an exemplar is extreme it may serve as a comparison standard which evokes prime inconsistent associations. In the above-mentioned study by Dijksterhuis, Spears, and colleagues (1998), a category (e.g., models) led to assimilation whereas an (extreme) exemplar (e.g., Claudia Schiffer) led to contrast effects (see also superman vs. superhero, Nelson & Norton, 2005; but see Schubert & Häfner, 2003). Studies that examined priming effects on the judgment of ambiguous stimuli point at two additional preconditions for contrast effects to occur: The traits that are activated by the primed stimulus need to be relevant to the target judgment or behavior to induce contrast effects. If the activated traits were irrelevant and the target was ambiguous, assimilation has been observed (Stapel & Winkielman, 1998). Moreover, primes that belong to the same category as the target are more likely perceived as a point of reference (cf. Brown, 1953). Previous research on animal versus human primes (Stapel & Koomen, 1997) suggests that the likelihood of contrast effects is enhanced when a story features a human as compared to a non-human protagonist.

On the recipient side, whenever people are predisposed to compare the prime with the target (which may be oneself or some other person or entity), contrast becomes more likely. In previous experiments, a dissimilarity-testing mindset was established through procedural priming tasks. Prior to the main priming event, participants completed a picture-comparison task which consisted of pairs of illustrated pictures. Participants were requested to either list *three similarities* (priming of a similarity testing mindset) or *three differences* (priming of a dissimilarity testing mindset) for each pair (e.g., Mussweiler, 2001; Corcoran, Hundhammer, & Mussweiler, 2009; Mussweiler & Damisch, 2008). This procedural priming task induced a similarity versus a dissimilarity mindset that was active in a subsequent experimental task. In a similar vein, Haddock, Macrea, and Fleck (2002) presented pictures of four fashion models and instructed participants to focus on similarities (similarity testing mindset) or differences

(dissimilarity testing mindset) between those four. As expected, the group that focused on dissimilarities obtained more correct answers on a subsequent knowledge test than the group that focused on similarities. For the field of media priming we assume that a recipient's processing goal, manipulated through explicit instructions, could influence the processing mindset in a similar direction.

When neither similarity testing nor dissimilarity testing is determined by establishing a certain mindset, what is the default priming outcome, assimilation or contrast? Considering mediated stories as a prime, the close connection between the recipient and the unfolding story and its protagonists that is characteristic of narrative comprehension and experience (Busselle & Bilandzic, 2008; 2009; Cohen, 2001; Gerrig, 1993; Mar & Oatley, 2008; Green & Brock, 2000) contributes to assimilation effects. This assumption is in line with research in the field of educational media and media literacy programming, where protagonists who engage in maladaptive behavior should ideally serve as a repulsive example. However, such interventions can backfire ("boomerang effects") due to unintended assimilation effects (Byrne, Linz, & Potter, 2009).

#### *The 'dosage hypothesis' of media priming*

One of the research lacunae in media priming is the lack of evidence that stronger primes exert larger effects (e.g., Roskos-Ewoldsen et al, 2009). Priming theory and research predicts that primes can vary in strength, which is a function of the intensity of the priming event (Carpentier, Roskos-Ewoldsen, & Roskos-Ewoldsen, 2008; Higgins, Bargh, & Lombardi, 1985). In the field of political priming, Miller and Krosnick (1996) referred to the *dosage* of the primed stimuli. The magnitude of a priming effect is supposed to be determined by the amount of information that is communicated and processed by the recipient. "The greater one's dosage of media content, the more one should be influenced by it" (p. 83). Research on the dosage hypothesis has been sparse

(Roskos-Ewoldsen et al., 2009). Correlational studies that used aggregate data in the political field are in line with the hypothesis (e.g., Holbrook & Hill, 2005; Willnat & Zhu, 1996). However, these results may be due to third variable effects (Carpentier et al., 2008). One experimental study that tested the dosage hypothesis presented information about energy policy and assessed judgments about President Carter (Iyengar, Kinder, Peters & Krosnick, 1984). They presented either six (high exposure) or three pieces of information (intermediate exposure) or no information at all. Whereas both, the high and the intermediate condition affected judgments about President Carter versus the control group, the former groups did not differ with regard to the magnitude of the effect. Carpentier and colleagues (2008) examined the impact of economic texts on ratings regarding President Reagan. To manipulate intensity, they presented experimental texts of different lengths (100 vs. around 300 words). In contrast to their assumption, text length (intensity) had no effect on their dependent variables. In sum, few studies focused on the dosage hypothesis so far. Two experiments examined prime intensity using a stimulus length manipulation but found no support. However, we believe that this result is preliminary. Due to its close linkage to basic priming theory (Roskos-Ewoldsen et al., 2009) we assume that the dosage hypothesis deserves further attention. As yet, no media priming study conducted so far investigated the dosage hypothesis under conditions of contrast or even both, assimilation and contrast. If dosage mattered (cf. Miller & Krosnick, 1996) a factor that activates similarity testing (assimilation) versus dissimilarity testing (contrast) should be particularly influential in a high dosage condition. The selective accessibility model (Mussweiler, 2003) suggests that the effect of a factor that stimulates dissimilarity testing is stronger when the level of self-activation is high (see above). If the dosage of media content increased the effects expected from the priming event, the latter interaction should be particularly pronounced in a high dosage condition.

*Summary, study overview, and predictions*

Media priming is a well-established phenomenon and a significant part of the literature on media influence (see for example Nabi & Oliver, 2009; Bryant & Oliver, 2009). However, research has been divided and a coherent theory of media priming is missing. Based on the active part of the recipient in the comprehension of stories, the direct perception behavior-link may be an insufficient explanation for many instances of media priming. The active self account (Wheeler et al., 2005; 2007) as well as the selective accessibility model (Mussweiler, 2003; 2007) suggest that the active self plays a crucial role in priming to behavior effects. The quality and the amount and activated self-content determine behavioral effects. Both theories involve the assumption that activated self-concepts can be either consistent or inconsistent with the prime, e.g., a stupid media character can activate self-content that is related to stupidity (“I am stupid”) or intelligence (“I am clever”). The kind of self-content that is activated and therefore the behavior that follows the prime depends on whether the recipient engages in similarity-testing or in dissimilarity testing. Previous research involved procedural priming methods to influence a participant’s mindset (similarity-testing or dissimilarity testing). Given that narrative comprehension and experience typically involves a close connection between the recipient and the protagonist (e.g., Busselle & Bilandzic, 2008; Mar & Oatley, 2008) our first hypothesis is that priming effects of a story will result in assimilation effects, unless a dissimilarity testing mindset is induced.

In the experiment outlined below, the media prime was a narrative with a stupidly acting soccer hooligan as the main protagonist. This distinct human exemplar was portrayed as extremely unintelligent, a trait which was highly relevant for a subsequent set of general knowledge questions.

H1: After reading a story about a stupid soccer hooligan (default condition) the performance in a test of general knowledge will be impeded, as compared to a control group.

It was further expected that the influence of media priming on behavior is subject to the readers' mindset. In previous research, this mindset was manipulated with the help of procedural priming. We assumed that explicit processing instructions would serve as an alternative way to evoke a dissimilarity testing mindset. Even if narratives tend to produce assimilation effects in a default condition, specific reading goals may prevent assimilation effects and may activate self-concepts that are contrary to the prime. In the present experiment we explicitly instructed half of the hooligan story-readers to think about self-related traits and own behaviors that are inconsistent with the hooligan traits and behaviors.

We were reluctant, however, to predict a clear-cut contrast effect in the field of general knowledge assessment. We believed that in this field, participants are somewhat limited to do better than individuals in the control group who perform up to their full potential. Therefore we put the issue of a contrast effect as a research question.

RQ1: Will the knowledge scores of readers with the goal of activating prime-inconsistent self-content when reading a story about a stupid soccer hooligan (dissimilarity condition) differ from the knowledge scores of a control group?

We did, however, assume that when reading the hooligan text, recipients in the dissimilarity condition obtain better scores than those in the default condition.

H2: Readers with the goal of activating prime-inconsistent self-content when reading a story about a stupid soccer hooligan (dissimilarity condition) will perform better in a test of general knowledge than readers who read the same story without this specific reading goal (default condition).

We further assumed that the influence of reading goals may interact with features of the story. Theory predicts that the size of a priming effect increases with the amount of information presented in a media priming event (Miller & Krosnick, 1996; Roskos-Ewoldsen et al., 2009). In previous studies, ‘dosage’ or ‘intensity’ of a prime was manipulated in providing shorter or longer informational texts (Iyengar et al., 1984; Carpentier et al., 2008). We prepared a short and a long version of the story. As the story unfolded, participants who read the longer version received more information about the soccer hooligan than participants who read the shorter version. Extending previous experimental studies that examined the main effects of dosage/intensity on assimilative priming, we investigated the influence of this variable on the reading goals factor (default versus dissimilarity testing condition). It was assumed that the differences between the default and the dissimilarity testing condition would increase with the dosage of the media prime. Differences between both reading goals (default condition vs. dissimilarity condition) should be more pronounced for the longer story.

H3: Differences between the default group and the dissimilarity testing group will be greater for the longer text than for the shorter text

Based on the active self-account (Wheeler et al., 2007) and the selective accessibility model, (Mussweiler, 2003; 2007) we considered the amount of self-activation among the recipients,

which included comparisons between the self and the main story character. We had two main expectations regarding this variable. First, participants who were requested to engage in dissimilarity testing should report higher levels of self-activation than the default group that read the same story. Second, we assumed the levels of self-activation to have opposite effects for participants in the default versus the dissimilarity testing condition (cf. Mussweiler, 2007). High levels of self-activation in the default group should be related to high levels of self-content that is consistent with the prime. Thus, self-activation should predict lower knowledge scores. In contrast, high levels of self-activation in the dissimilarity group should be related to high levels of self-content that is inconsistent with the prime. Thus, in this condition higher self-activation should predict higher knowledge scores. As a consequence, the differences between both reading goal groups should be particularly large when self-activation is high. As the differences between the reading goal conditions should be most distinctive in the longer story version, this interaction should be most striking when recipients were confronted with the long story versions.

H4: Performance differences between the default group and the dissimilarity testing group will increase with the amount of self-activation. This relationship will be strongest for the longer stories.

In addition to the variables needed to examine the hypotheses and the research question, state transportation was assessed. This variable was not at the heart of the present investigation but allowed us to compare the recipients' immersion into the narrative stimuli with recipients' immersion scores reported in previous studies on narrative processing and narrative impact (Green, 2004; Appel & Richter, 2010).

## Method

### *Participants*

Eighty-five participants were recruited in introductory psychology or education classes at an Austrian University. Four persons were excluded from the analyses because they did not follow instructions or did not complete the experimental material. The resulting 81 participants (45 female, 36 male) had a mean age of 26.1 years ( $SD = 5.5$ ). They received partial course credit for participating.

### *Material*

*Stories.* Short movie scripts were created. The experimental story was about a 35-year-old man named *Meier*, described as a xenophobic and aggressive soccer hooligan with a severe alcohol problem. The full story, headlined *Slow on the Uptake*, goes like this: Meier gets up in his flat. He looks at his calendar and has trouble understanding the day's motto. He dresses like a right-wing skinhead. Upon leaving his apartment, he runs into an argument with his neighbor, a Turkish immigrant. He then meets his friends in a bar and gets drunk. Later he joins his fellow hooligans at a soccer match and gets into a fight. He sleeps through the following day. On the next morning he learns from a newspaper that the match he attended was lost by his team and gets angry.

Two versions of this story were created that varied in length (cf. Carpentier et al., 2008; Miller & Krosnick, 1996). One version of the script included the full story and a second version consisted of half of the story, ending with the drunk scene in a bar. The shorter story-version was two pages in length (73 lines, 369 words), the longer four pages (152 lines, 690 words). As a control story, another short movie script was employed (4 pages, 138 lines, 688 words). The main protagonist was again called Meier. His character, however, does not display any stupid behavior. In the first sequence of this story, Meier waits at an airport. After an expected passenger arrives,

they both travel by car to another airport for reasons unknown to the reader. This story gave no reference as to the characters' intellectual abilities.

Design and layout of the stories followed movie screenplay conventions. They included dialogue and action descriptions, starting with a brief picture of the setting, e.g., BEDROOM / INTERIOR / DAY. The screenplay mode of presentation was chosen for two reasons: First, initial evidence indicates that readers of screenplays can get easily involved into a story of limited length. Second, the screenplay version that was created had a more professional appeal than a potential short story. All story versions were provided with line numbers, which were useful for one of the instructed activities.

*Reading Goals.* Those who received the hooligan text were randomly assigned to one of two conditions. The first group was instructed to read the text carefully and to summarize the story in two or three sentences. The second group received a different introduction which began with a task specification: "While reading this movie script, it is your job to make clear differences between yourself and the main character." Participants in this group had to underline all text passages in which they recognized differences between themselves and Meier. Additionally they were instructed to write down the five most remarkable differences and indicate the matching line number. We expected that the latter instruction initiated more self-activation and that this increased self-activation was directed towards differences between the hooligan and the self. Participants who were randomly assigned to the control condition were instructed to carefully read and summarize the control text.

*General Knowledge.* The participants filled out a multiple-choice test on general knowledge which was introduced as being difficult to very difficult. The 30 questions addressed classic knowledge domains like Geography (*What is the capital of Libya?*), Technical Sciences (*What kind of speed is expressed by the letter 'c' in Physics?*) or the Arts (*Who painted La*

*Guernica?*). Four answers including the correct one were provided. For each participant, the sum of correct answers in the knowledge test was calculated. With a minimum score of three (10%) and a maximum of 20 (67%) correct answers on the 30 questions, the test was difficult,  $M = 10.28$  (34.57%),  $SD = 3.37$ . The percentage of correct answers on the knowledge test (sum of correct answers / 30 x 100) served as our main dependent variable. Because this measure was moderately right-skewed in the raw data it was transformed (sqrt) prior to the inference statistics.

*Active self.* Six items focused on the state of self-activation and most of these items described a comparison with the main character of the story (“While reading, I thought about myself”, “While reading, I paid attention on similarities and differences between Meier and my own experiences and behavior”). The items went with a seven-point scale ranging from 1 to 7 ( $M = 3.18$ ;  $SD = 1.54$ ). The reliability of this scale was good, as indicated by Cronbach’s  $\alpha = .83$ . An average score of all six items was built and used in all further analyses.

*Transportation.* A pre-tested German version of the transportation scale (Green & Brock, 2000; Appel & Richter, 2010) consisted of 14 items (e.g., “The narrative affected me emotionally”, “While I was reading the narrative, I could easily picture the events in it taking place”). Three imagination items were adopted to fit the story. All items went with a seven-point scale ranging from 1 to 7. The transportation scale yielded a Cronbach’s  $\alpha$  of .76. An average score was calculated. The control story ( $M = 4.11$ ;  $SD = 0.96$ ) and the hooligan story ( $M = 4.05$ ;  $SD = 0.83$ ) produced a similar amount of transportation,  $t(79) < 1$ . The transportation scores of those who read the hooligan story were about the same in all experimental conditions (main effects and interaction,  $F_s < 1.2$ ,  $p_s > .28$ ). Self-activation and transportation were positively related with  $r = .36$ ,  $p < .01$ , for the total sample.

*Procedure*

Participants took part in groups of 16 to 30 persons either before or after class. They received a booklet that was introduced as containing material from two unrelated research projects, with *story-scripts* and *questionnaire development* as the respective fields of research. The booklet consisted of an introduction, the story, the knowledge test, the reading experiences questionnaire and demographic measures (in this order). On average, participants finished the booklet in about 15 minutes.

### *Design*

The 81 participants were assigned randomly to one out of two versions of the experimental hooligan story (31 read the shorter, 32 read the longer version) and one out of two processing modes (34 received the default, 29 received the dissimilarity testing instruction). The remaining 18 participants read the control story. The data of the control group was used primarily as a baseline for calculating difference scores for the participants in the experimental conditions. Thus, the experiment followed a 2 (*story length*: short vs. long) x 2 (*reading goals*: default vs. dissimilarity testing) design with both factors varied between subjects.

### Results

For all significance tests reported here, type-I-error probability was set to .05 (two-tailed, unless indicated otherwise). Cohen's *d* or partial  $\eta^2$  are reported as measures of effect size (Cohen, 1988). Descriptive statistics and correlations of key variables in the study are given in Table 1.

### | Table 1 |

Prior to our main analyses, variations of the self-activation measure due to the experimental treatment were analyzed for the hooligan story readers. As expected, dissimilarity

testing evoked more self-activation ( $M = 4.30$ ;  $SD = 1.31$ ) than default reading ( $M = 2.23$ ,  $SD = 0.99$ ). This main effect was significant,  $F(1; 59) = 49.6$ ,  $p < .001$ , whereas self-activation was unaffected by story-length or the interaction between both factors,  $F_s < 1$ .

Figure 1 illustrates the main results of our experimental treatment with the control group as baseline. The mean percentage of correct answers of the control group was subtracted from the percentage of correct answers of those participants who had read the hooligan story under one of the four experimental conditions (default condition/short story; default condition/long story; dissimilarity condition/short story; dissimilarity condition/long story). Negative difference scores indicate a worse performance in the knowledge test than the control group; positive difference scores indicated a better performance than the control group.

| Figure 1 |

*Assimilation: A story about a stupid person impeded the performance in a general knowledge test*

Hypothesis 1 predicted that participants who read a story about a stupid person in the default condition perform worse in a test of knowledge than a control group who read an unrelated text. Control text readers gave an average of  $M = 36.85\%$  correct answers ( $SD = 10.00$ ). In line with our first hypothesis, the percentage of correct answers was smaller for the participants in our default condition (no goal to engage in dissimilarity testing). This applies to the short story version  $M = 32.16\%$  ( $SD = 11.95$ ) as well as to the long version ( $M = 30.39\%$ ;  $SD = 9.71$ ). Using the transformed dependent variable (sqrt) we conducted a t-test to compare the mean of those who read the hooligan story without specific instructions ( $n = 34$ , short and long story version collapsed) with the control group mean ( $n = 18$ ). As expected, participants who read a story about a stupid soccer hooligan in the default condition performed worse in a test of

general knowledge ( $M = 5.51$ ;  $SD = 0.97$ ) than participants who read a control text ( $M = 6.02$ ,  $SD = 0.81$ ),  $t(50) = 1.90$ ,  $p = .032$  (one-tailed),  $d = 0.53$ . The mean knowledge scores of those who received the dissimilarity-testing instruction ( $n = 29$ ;  $M = 6.01$ ;  $SD = 0.96$ ) was almost identical with the control group results, thus, no contrast effect could be observed (Research Question 1).

### *Reading goals and story length*

The following analysis focused on those who read the hooligan story only. When the control group participants are disregarded, the experimental treatment follows a 2 x 2 experimental design. The joint influence of reading goals (default reception vs. dissimilarity testing) and story length (short vs. long) were tested by means of an ANOVA with the percentage of correct answers (sqrt) as the dependent variable.

It was predicted that the dissimilarity testing goal lifted the test performance (Hypothesis 2) and that the difference between both conditions was more pronounced when the text was longer (Hypothesis 3). As expected in Hypothesis 2, participants in the dissimilarity testing group scored better than those in the default processing group,  $F(1, 59) = 4.07$ ,  $p < .05$ ,  $\eta_p^2 = .07$ . Those who actively looked for differences between themselves and the story protagonist outperformed participants who were not explicitly instructed to do so. The second factor, text length, yielded no significant main effect ( $F < 1$ ).

We further predicted that the differences between dissimilarity testing and default reception are larger in the condition of a high priming dosage, i.e., the longer text. The data seemed to follow this pattern (default short text:  $M = 5.57$ ,  $SD = 1.08$ ; default long text  $M = 5.44$ ,  $SD = 0.88$ ; dissimilarity short text:  $M = 5.75$ ,  $SD = 1.02$ ; dissimilarity long text:  $M = 6.25$ ,  $SD = 0.85$ ). However, the corresponding interaction between text-length and processing mode did not reach statistical significance,  $F(1, 59) = 1.66$ ,  $p > .10$ . Thus, Hypothesis 3 could not be supported.

*Different roles of self-activation*

As reported above, dissimilarity testing was associated with more self-activation than regular reception. Besides this effect on the amount of self activation, we expected that self-activation would play a different role depending on the reading goals. Comparing oneself with an underperforming protagonist in a default condition should be associated with a decrease in performance. The opposite is expected when dissimilarity testing takes place: The more participants compare themselves with an underperforming protagonist during dissimilarity testing, the better their own performance. This led us to suggest that the processing mode would matter most for those who actively compared themselves with the protagonist. Processing mode and self-activation were expected to exert their clearest impact on the group that read the longer text. If the data followed these predictions, a three-way-interaction should be found. Therefore we conducted a regression analysis with processing mode (effect-coded: -1 = default; 1 = dissimilarity testing), story length (effect-coded: -1 = short; 1 = long), and self-activation (continuous,  $z$ -transformed) as well as all higher-order interactions as predictors. Knowledge test performance served as our dependent variable.

In line with the assumptions, a significant three-way-interaction between processing mode, story length, and self-activation was found,  $B = 0.45$ ,  $SE_B = 0.17$ ,  $t = 2.74$ ,  $p < .01$ ,  $\Delta R^2 = .11$ . To further inspect this three-way-interaction, separate analyses for short and for long texts were conducted. When only the long story versions were analyzed, the interaction between the self-activation intensity and the reading goals was trend-significant,  $B = 0.40$ ,  $SE_B = 0.20$ ,  $t = 2.02$ ,  $p = .05$ ,  $\Delta R^2 = .10$ .

Figure 2 provides a graphic depiction of this interaction. In order to test for simple effects (cf. Cohen et al., 2003), both conditions were compared at a high degree of self-activation (one standard deviation above the sample mean) and a low degree of self-activation (one standard deviation below the sample mean). In these comparisons, an effect of processing mode occurred only in participants who reported a high degree of self-activation ( $B = 1.50$ ,  $SE_B = 0.58$ ,  $t = 2.58$ ,  $p < .05$ ,  $\Delta R^2 = .17$ ) but not in participants who reported a low degree of self-activation ( $B = -0.24$ ,  $SE_B = 0.63$ ,  $t = -0.39$ ,  $p > .70$ ,  $\Delta R^2 = .00$ ). This pattern of effects is in line with Hypothesis 4 and suggests that high self-activation has indeed different effects for recipients who are in a default processing mode versus recipients who look out for differences between themselves and a protagonist. A different pattern of results emerged when the short story versions were examined, as indicated by a trend-significant two-way interaction  $B = -0.51$ ,  $SE_B = 0.27$ ,  $t = -1.87$ ,  $p = .07$ . We are cautious in interpreting this trend-significant finding, because it is non-significant at the  $p = .05$  alpha-level and its direction was not expected.<sup>3</sup>

### Discussion

Models on the comprehension and experience of narratives as well as some lines of priming theory suggest that the active self plays a crucial role in media priming. Predictions developed from this theoretical perspective were tested in an experimental study that involved a short story as the prime and cognitive performance served as the main dependent variable. As expected, participants who read a narrative about a stupidly acting soccer hooligan performed worse in the knowledge test than participants who read a narrative about a character with no reference to his intellectual abilities. The present study is, to our knowledge, the first to show media priming effects of story characters on cognitive performance.<sup>4</sup> We believe that the short

term influence on cognitive functioning is a promising new field of inquiry for future research on media priming.

Consistent with many narratives that we encounter on TV, at the movies, or in books, the protagonist of the experimental story was rather extreme by everyday standards. Previous research on non-narrative priming found that such extreme and distinct human exemplars do not lead to assimilation but rather to contrast effects (cf., Biernat, 2005). Our protagonist, however, did produce an assimilation effect in the default condition. Scholars have emphasized the close connection between recipient and protagonist in narrative comprehension and experience from different perspectives (Busselle & Bilandzic, 2008; 2009; Cohen, 2001; Gerrig, 1993; Mar & Oatley, 2008; Green & Brock, 2000). Narratives tend to make people ‘walk in someone else’s shoes’. Possibly, this aspect of narrative comprehension and experience contributes to assimilation effects even if a protagonist is human, distinct, and engages in extreme behavior. Thus, one may assume that a stimulus that is included in a narrative is more likely to yield assimilation effects than the same stimulus that is not part of a narrative. To provide further evidence on the role of the narrative form in media priming, future research is encouraged that compares priming effects of stimuli presented in a narrative versus a non-narrative context.

Media priming is no “hypodermic needle” that leads to effects irrespective of recipient responses. In line with theories that highlight the role of the active self in priming (Wheeler et al., 2007; Mussweiler 2003), our results indicate that the recipients’ mindset critically determines priming outcomes. Whenever people perceive a certain trait or stereotype as a distinct standard to compare to, assimilation becomes unlikely and prime-inconsistent self-content is activated. We deliberately instructed one group of participants to view the hooligan character in the story as such a standard and to identify dissimilarities between the hooligan and his or her own person. Supporting the assumption that this reading goal suspends assimilation effects, this group showed

better results in the knowledge test than those who read the hooligan story without this instruction. However, we did not find a clear contrast effect, despite the rather explicit instruction to engage in dissimilarity testing. Those participants who read the hooligan story with the dissimilarity instruction did not score better in the knowledge test than the control group who read an unrelated story. We were reluctant to hypothesize contrast effects in the first place because retrieval of knowledge may be particularly difficult to enhance through short-term interventions (but see for example Dijksterhuis & van Knippenberg, 1998). Potentially, contrast effects can be more easily obtained in studies that use intelligent exemplars, in studies that examine cognitive performance tasks that require the processing of new information, or in studies that examine judgments about other people rather than complex recipient behavior.

We further predicted that the activation of self-relevant content leads to prime-consistent behavior (assimilation) in the default condition, but to prime-inconsistent behavior (contrast) in the dissimilarity condition, particularly in the long-story version. Our results were in line with this prediction: If not explicitly instructed to think about differences between one's own person and the soccer hooligan, self-activation tended to go along with lower performance. In contrast, self-activation tended to go along with higher performance when participants were explicitly instructed to find dissimilarities. Thus, the difference between the processing modes increased with the amount of self-activation, at least when the long story version is considered. This underscores the importance of the active self when media stories serve as a prime. An alternative explanation of our reading goal results is that the instruction to engage in dissimilarity testing may have simply distracted the readers from the text. Additional analyses do not support this interpretation. All participants in the contrast condition noted and underlined differences between the main protagonist and themselves (as instructed); at the same time, they were as transported

into the story world ( $M = 4.10$ ,  $SD = 0.89$ ) as those who simply read the story,  $M = 4.02$ ,  $SD = 0.77$ ,  $t(61) = 0.37$ ,  $p = .71$ .

We would like to emphasize the importance of considering social comparison processes and potential contrast effects in future media priming theory and research. Acknowledging the possibility of effects opposite to the media stimulus provides intriguing research perspectives – not only for the field of media priming but for research on media effects in general.

#### *Limitations and future research*

Our stimulus story may be considered a first limitation of the present research. The story was presented in form of a movie script because this was an economic way to create stimulus material that fit our preconceptions. Moreover, we assumed that - albeit unusual for the reader - the screenplay style can produce rather strong immersion. The average transportation score in our sample was around the midpoint of the scale ( $M = 4.05$ ). Previous studies that, like us, employed the complete transportation scale as introduced by Green and Brock (2000) yielded similar average scores for stories of high craftsmanship: A 3800 word story that was chosen because it contained compelling prose and addressed topics of interest to students resulted in average transportation scores of  $M = 4.25$  to  $M = 4.40$  (Green, 2004). The German language transportation items used in the present study yielded an average score of  $M = 3.83$  for a dramatic murder story (Appel & Richter, 2010). These results indicate that our screenplay version was not substantially less immersive than well-crafted texts presented in conventional prose. In sum, the story was rather unconventional, as it was a short movie script created for the purpose of the present study. Yet the movie script format enabled us to create a story for the purpose of this study without the help of a professional fiction writer. The average transportations scores also indicate that the story's potential to immerse readers did not differ substantially from other short stories written by professional writers in a conventional format. Although we have reason to

believe that our scripted text was a feasible way to present the story, future research is warranted to further corroborate the validity of this approach.

Second, although descriptive data pointed at larger effects of the reading goal instruction for the longer story version than for a shorter version, the interaction of both factors was non-significant. Thus, we were unable to demonstrate that the processing mode gains importance with an increasing length of the story (our refined dosage hypothesis, cf. Miller & Krosnick, 1996). The power to detect a non-disordinal interaction is often smaller than the power to detect a main effect (Maxwell & Delaney, 2004). Given our patterns of results, the power of the present experiment may have been too small to identify the expected interaction.

Third, story length was used to examine the influence of media dosage (Miller & Krosnick, 1996). We presented either a full story version or the participants read only about half of the story. As the hooligan protagonist was presented in a homogeneous manner throughout the whole text (e.g., his bad memory is referred to in the first and the second part of the story), we believe that story length was not confounded with story content. We think that this method preserved a rather realistic form of media use in comparison to alternative operationalizations which might have included repeated exposures to the same story (frequency of the priming event) or the manipulation of the time reserved to read the text (duration of the priming event). Nonetheless, future studies are encouraged that develop alternative ways to operationalize the dosage/intensity of a narrative.

Fourth, this study did not investigate stimuli factors that facilitate assimilation or contrast. Our design included a special task that requested recipients to process the text in a contrastive manner. Further research is needed to investigate which conditions contribute to variations in assimilation or contrast effects. The narrativity of the story or the extremity of the depicted traits/behaviors may be examined as stimulus factors (cf. Busselle & Bilandzic, 2008). Likewise,

future studies are encouraged to manipulate how positive the characters are described, and how likely recipients are inclined to experience closeness with the main character (Mussweiler, 2003). As compared to our hooligan protagonist (a rather negative figure), more positive characters may increase the tendency for assimilation effects. Future research in this direction seems particularly warranted, as popular narratives tend to regularly comprise positive figures as leading characters (cf., Appel, 2008).

In addition to stimulus features, individual differences (e.g., trait self-consciousness; need for cognition), and related interactions with stimulus factors may be examined. On the processing level, experiential states during media use may be investigated more systematically (cf. Green, 2005). Transportation (e.g., Appel & Richter, 2010; Green & Brock, 2000) as well as reminders of the reader's own experiences (Strange & Leung, 1999) have been linked to stronger narrative persuasion. In the present study, we found transportation to vary in line with self-activation, but we did not find a significant interaction between the experimentally induced processing mode and transportation on the knowledge test results. It seems worthwhile to further intensify research on recipient immersion in the context of narrative priming. This may incorporate more protagonist-centered conceptualizations of experiential states, such as suspense (e.g., Vorderer & Knobloch, 2000), empathy (e.g., Zillmann, 1991), or identification (e.g., Oatley, 1994).

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## Endnotes

<sup>1</sup> Apparently, the (former) fashion model Claudia Schiffer was (and maybe still is) associated with low intellectual ability in the Netherlands where this study was conducted.

<sup>2</sup> This is a critical distinction from persuasion effects which are supposed to be more stable than priming outcomes. Persuasive effects of a fictional narrative were even found to increase over time (Appel & Richter, 2007; see also Appel, 2008).

<sup>3</sup> The negative prefix of this regression weight was unexpected. However, we are cautious in interpreting this trend-significant finding. A graphic analysis of the data identified one multivariate outlier that drove this trend-significant interaction effect among readers of the short story versions. Excluding this outlier, the interaction observed for the short story version is non-significant  $B = -0.31$ ,  $SE_B = 0.35$ ,  $t = -0.90$ ,  $p = .38$ ,  $\Delta R^2 = .03$ . Excluding this outlier, the results of the three-way interaction are trend-significant with  $B = 0.35$ ,  $SE_B = 0.19$ ,  $t = 1.84$ ,  $p = .07$ ,  $\Delta R^2 = .05$ . Additional exploratory analyses addressed the relationship between transportation and performance depending on the processing mode. For the longer versions, the descriptive data point at a negative association between transportation and cognitive performance in the default condition, and a positive association between transportation and cognitive performance in the dissimilarity testing condition. This interaction was not significant, however, with  $B = 0.40$ ,  $SE_B = 0.32$ ,  $t = 1.25$ ,  $p > .20$ ,  $\Delta R^2 = .04$ .

<sup>4</sup> Short term effects of media use on cognitive performance were also demonstrated in one study on stereotype threat (Steele & Aronson, 1995) that used TV commercials as primes (Davies, Spencer, Quinn, & Gerhardstein, 2002, Study 1). Stereotype threat differs from the priming effects outlined here in crucial regards: Stereotype threat is a psychological state of stress and cognitive load that is likely when a negative stereotype of one's own group is activated (e.g., "women are bad at math"), and the target person identifies with the group (women) as well as with the task ("I do fairly well at math", Schmader, Johns & Forbes, 2008).

Table 1:

*Means, Standard Deviations and Intercorrelations of Relevant Variables*

	<i>M</i>	<i>SD</i>	1	2	3	4
1 Story length (short vs. long) <sup>a</sup>	0.51	0.50				
2 Processing (default vs. dissimilarity testing) <sup>b</sup>	0.46	0.50	.02			
3 Self-Activation	3.18	1.54	.04	.67***		
4 Transportation	4.05	0.83	-.10	.05	.41**	
5 Correct answers (square-root)	5.74	0.99	.09	.25*	.20	.12

*Note.*  $N = 63$  (experimental text only). <sup>a</sup> dummy coding 0=short text, 1 = long text; <sup>b</sup> dummy coding 0=default instruction, 1 = dissimilarity testing instruction

\*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

Figure caption

*Figure 1.* The impact of story length and reading goal on knowledge test scores. Descriptive results (means, standard errors) with the average percentage of correct answers in the control group as baseline.

*Figure 2.* Data plot with the amount of self-activation, and reading goal as predictors, and knowledge test scores (percent correct, sqrt) as the criterion. Long story version only.

Figure 1.

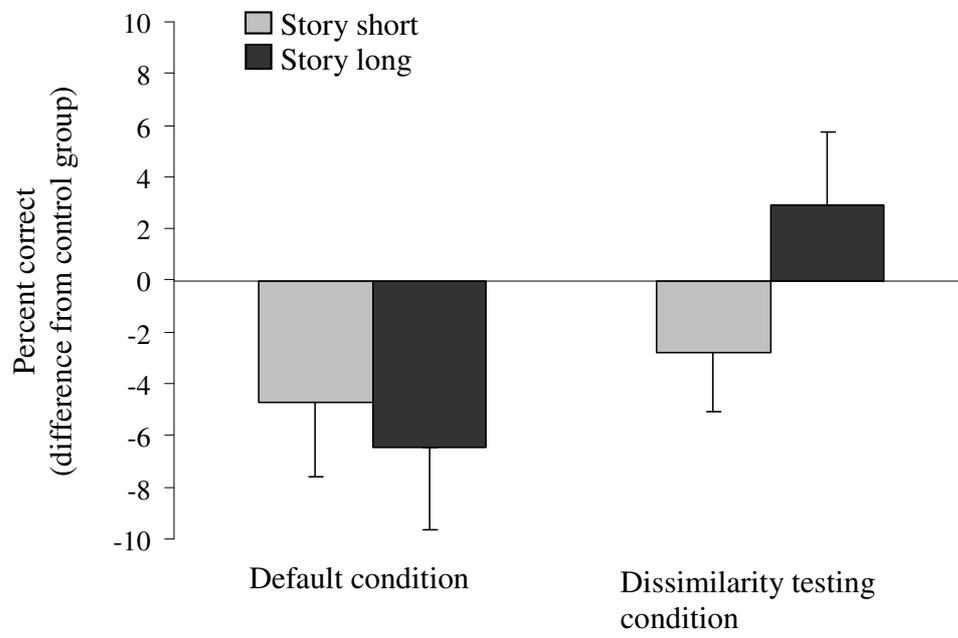


Figure 2.

