

# Gender Differences in Text-Based Interest: Text Characteristics as Underlying Variables

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## ABSTRACT

Reading motivation is a fundamental basis for reading behavior and performance. For learners, interest is an exceedingly important component of reading motivation. Prior research has shown that students' text-based interest varies significantly between texts. However, it is still unclear why one text elicits greater interest over another. Therefore, in this study, we investigated whether different text characteristics, such as text genre, topic, and protagonists' gender, are systematically related to students' text-based interest. Furthermore, we examined differences between girls and boys. We used data from a sample of 504 fourth-grade elementary school students to answer these questions. Eight texts were manipulated experimentally with respect to text genre, topic, and protagonists' gender. Students were assigned randomly to read one of the eight texts. Structural equation models showed that students' text-based interest was related to text genre, topic, and students' gender. Moreover, students' gender interacted significantly with text topic and protagonists' gender, with boys less interested in texts with a more female-typed text topic and in texts with female protagonists. The findings imply that text characteristics might help educators select reading material to encourage students' text-based interest. The results are discussed in terms of research and educational practice.

Proficiency in reading is essential for a host of tasks, such as deriving meaning from texts, not only in school but throughout life as well. Therefore, reading is a crucial precondition for academic success and participation in society (Martínez, Mateos, Martín, & Rijlaarsdam, 2015; OECD, 2019). Reading motivation is significantly related to reading competence and predicts reading performance beyond cognitive skills (e.g., Becker, McElvany, & Kortenbruck, 2010; De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012; Hebbecker, Förster, & Souvignier, 2019; Miyamoto, Pfof, & Artelt, 2019; Toste, Didion, Peng, Filderman, & McClelland, 2020; Wigfield, Gladstone, & Turci, 2016). One important motivational component is interest (Krapp & Prenzel, 2011; Renninger & Hidi, 2016; Schiefele, 2009). Although most elementary school students are generally motivated to read, some experience low motivation to engage in reading and have low interest in literature (Mullis, Martin, Foy, & Hooper, 2017). Boys, in particular, are overrepresented among readers with lower reading motivation (Clark, 2019; Logan & Johnston, 2009; Marinak & Gambrell, 2010; McGeown, Goodwin, Henderson, & Wright, 2012). Consequently, reading materials that meet students' reading preferences can play an important role in fostering reading motivation.

Research has shown that students' reading-related interests vary widely and that gender differences in text preference exist (Clark, 2019; McGeown, Osborne, Warhurst, Norgate, & Duncan, 2016; Merisuo-Storm, 2006). Drawing on theories positing interest as a crucial motivational construct and gender as a core individual characteristic, various text-related factors, such as text topic or genre, have been proposed as potential underlying factors of differences in students' text-based interest (Ainley, Hidi, & Berndorff, 2002; Hidi, 2001; Hidi & Renninger, 2006; Krapp, 2002). However, it is still not clear which text characteristics affect students' text-based interest and whether gender-specific effects occur. Furthermore, previous studies have mainly focused on only one text characteristic. Therefore, in the present study, we aimed to scrutinize the role of multiple text characteristics and students' gender in text-based interest through an experimental variation of texts.

## Interest as Motivational Component

Much research has emphasized the multifaceted structure of reading motivation, confirming that interest plays an essential role in motivational processes (Conradi, Jang, & McKenna, 2014; Neugebauer & Fujimoto, 2020; Schiefele & Löweke, 2018; Schiefele, Schaffner, Möller, & Wigfield, 2012). Intrinsic motivation is the intention to do something because it is experienced as interesting or satisfying (Ryan & Deci, 2017). Thus, interest can act as an important source of intrinsic motivation (Hidi & Harackiewicz, 2000; Renninger & Hidi, 2016). In terms of reading, intrinsic reading motivation could stem from interest in the reading material. Intrinsically motivated activities are perceived as rewarding, independently of external incentives such as good grades in school. Students' intrinsic reading motivation is associated with further motivational variables, such as attitudes, values, and interest (Conradi et al., 2014). Reading attitudes have been defined "as acquired predispositions to respond in a consistently favorable or unfavorable manner with respect to aspects of reading" (McKenna, Conradi, Lawrence, Jang, & Meyer, 2012, p. 285). Attitudes are based on positive or negative feelings about reading or more specific aspects related to reading, such as a particular book series. Positive reading attitudes foster students' desire to engage in reading but can also develop or change over time (Nolen, Horn, & Ward, 2015). Consequently, students with positive reading attitudes are also described as harboring interest in reading or reading interests (McKenna et al., 2012). The value of reading, meanwhile, refers to students' feelings about reading as an enjoyable or important and useful activity (Conradi et al., 2014; Eccles, 2005). Thus, reading value also contributes to reading motivation. If the perceived value of reading is high, a person's motivation to engage in reading is probably higher as well (e.g., Conradi et al., 2014).

Furthermore, interest is another important motivational variable which directs attention and behavior and was the central construct of the present study. Interest is a core element of self-determined actions and therefore a crucial source of intrinsically driven reading and learning processes (Ainley, Hidi, & Berndorff, 2002; Hidi, 2001; Hidi & Renninger, 2006; Silvia, 2006). Interest is often described with respect to three characteristics. First, it is often subdivided into situational interest and individual interest (Hidi & Renninger, 2006; Krapp, 2007; Schiefele, 2009; Schraw & Lehman, 2001). *Situational interest* is typically defined as an arousal of attention that is fleeting or temporary and that can be sparked by features of a text or the environment (Hidi & Harackiewicz, 2000; Hidi & Renninger, 2006; Knogler, 2017). It describes the extent to which a person is interested in something in a specific situation (Boekaerts & Boscolo, 2002; Hidi & Renninger, 2006; Schraw & Lehman, 2001). In contrast, *individual interest* refers to a rather stable, dispositional characteristic of a person and can be described as an enduring form of interest (Conradi et al., 2014; Krapp, 2002; Renninger & Hidi, 2016). Therefore, individual interest should be related to reading attitudes because it is likely that students with individual interest in reading aim to reengage in reading over time as well (McKenna et al., 2012). Second, referring to Krapp's (2002) person-object theory of interest, interest is based on the relation between a person and a specific object, which can be of a diverse nature, such as a school-related domain (e.g., language), an activity (e.g., reading), or a particular book. Third, interest comprises both affect- and value-related components (Ainley, 2006; Krapp, 2002; Schiefele, 2009). Thus, it is based on positive emotions, such as enjoyment or curiosity while reading and the perceived personal relevance of reading.

Moreover, an initial spark of interest can manifest into an individual interest. Hidi and Renninger's (2006) model of interest development distinguishes among four phases: triggered interest, maintained interest, emerging individual interest, and well-developed individual interest. The former two phases represent situational interest, whereas the latter two represent individual interest. Moreover, although triggered interest is mainly characterized by affective components such as higher attention and positive emotions, the perceived value of the activity increases as a person moves through the phases from maintained situational interest to the individual interest forms (Ainley, 2006; Hulleman, Durik, Schweigert, & Harackiewicz, 2008). Thus, situational interest can serve as an important starting point for the development of enduring interest (Hidi & Renninger, 2006; Krapp, 2002). Interest-driven actions have been shown to be associated with positive emotions, personal relevance, or thirst for knowledge (Guthrie et al., 2007; Hidi & Renninger, 2006; Rotgans & Schmidt, 2014; Silvia, 2006).

Text-based interest reflects whether a person is interested in a specific text at a certain moment. In the context

of reading research, text-based interest is often conceptualized as a subform of situational interest (Hidi, 2001; Schraw & Lehman, 2001; Wade, 2001). Moreover, text characteristics related to the text content or text structure are assumed to activate students' interest (Hidi, 1990; Wade, 2001). Empirical findings have shown that higher levels of text-based interest were related to greater persistency, higher levels of attention, and better reading comprehension (Fulmer & Frijters, 2011; Guthrie, Hoa, Wigfield, Tonks, & Perencevich, 2005; Soemer & Schiefele, 2019). However, although interest has been repeatedly shown to be one important source for intrinsically motivated reading, it is not clear which specific text characteristics affect students' interest and whether text-based interest differs by gender. Moreover, not only text characteristics or gender alone can be assumed to be significant for text-based interest, but also interactions between the two (Ainley, Hillman, & Hidi, 2002; Graham, Tisher, Ainley, & Kennedy, 2008).

## Interest Related to Text Characteristics

Students encounter various types of texts in and outside the school context that they can find differently interesting (Clark, 2019; McGeown, Bonsall, Andries, Howarth, & Wilkinson, 2020; McKenna et al., 2012). Thereby, different text characteristics can serve as keys to interest (Hidi, 2001; Wade, 2001). For example, text genre, text topic, and gender of protagonists have been shown to affect students' text-based interest (Ainley, Corrigan, & Richardson, 2005; Hidi, 2001; McGeown et al., 2020; Schraw & Lehman, 2001; Silvia, 2006). In this section, the relations among text genre, text topic, protagonists' gender, and text-based interest will be brought into focus.

### Text Genre

Different text genres are characterized by genre-specific features, such as content, text structure, and language style (Best, Floyd, & McNamara, 2008; Duke, Caughlan, Juzwik, & Martin, 2012; Mullis & Martin, 2015). In the elementary school context, a distinction is often made between narrative and informational text genres (Guthrie et al., 2007; Mullis & Martin, 2015; Nippold, Duthie, & Larsen, 2005; Pfof, Dörfler, & Artelt, 2013). Whereas texts in the narrative genre generally focus on a story line and actions by characters, informational texts present information and facts on topics or events (e.g., Best et al., 2008; Graesser, McNamara, & Louwerse, 2003). Moreover, both text genres comprise various subtypes, such as fictional stories, novels, and tales (narrative genre) or newspaper articles, nonfiction books, and biographies (informational genre; e.g., Mullis & Martin, 2015). In terms of the language style, informational texts usually have a higher vocabulary load and a more complex structure as compared with narrative texts (Graesser et al.,

2003). There are also further genre-specific characteristics of texts, such as the use of an introspective, dialogue, and a lively narrative style (narrative texts) versus descriptions, definitions, and a clear, objective style (informational texts). In addition, narrative and informational texts have different primary purposes (Best et al., 2008; Duke et al., 2012). Whereas narrative texts provide the reader with literary experiences, such as entertainment, emotional involvement, or insights into the characters, informational texts provide knowledge or information to the reader (Mullis & Martin, 2015).

Although the Progress in International Reading Literacy Study (PIRLS; Mullis et al., 2017; for Germany: Hußmann et al., 2017) reports regularly on elementary students' reading literacy in different text genres, only a few studies have related different text genres to students' text-based interest. Empirical findings have shown that during leisure time, students read narrative texts more often than informational texts (Clark, 2019; Duncan, McGeown, Griffiths, Stothard, & Dobai, 2016). Students in grades 3–6 reported generally reading more fiction than nonfiction (Parsons et al., 2018), and secondary school students preferred narrative texts, such as novels, stories, or tales, over nonfiction books (Pfof, Artelt, & Weinert, 2013). Clark (2019) presented similar results for students ages 8–11 and highlighted that students read fiction more often than nonfiction, magazines, or news. Locher, Becker, and Pfof (2019) examined ninth-grade students' recreational reading interests by comparing text genres and found that students mostly enjoyed reading contemporary fiction, fantasy, and science fiction and much less frequently reported preferring nonfiction. However, only a few studies have investigated whether text genre was a significant factor for students' text-based interest when the text topic was held equal across texts (Cervetti, Bravo, Hiebert, Pearson, & Jaynes, 2009; Romero, Paris, & Brem, 2005). The results underscored that elementary students did not clearly prefer one text genre over another. However, it should be noted that the samples of both studies were rather small ( $N = 74$  and  $34$ , respectively). There are also differences in the definition of narrative and nonfictional text genres, so individual text types are not always uniformly assigned to the same text genre. Therefore, research on the relation between text genre and text-based interest should be extended.

### Text Topic

In addition to text genre, the topic of a text directly relates to students' text-based interest. Reading a text on a specific topic that is considered personally relevant can provide an intrinsic purpose for readers, such as gaining deeper knowledge about the preferred topic. Research has indicated that students' level of interest is significantly affected by the text topic (Ainley, Hidi, & Berndorff, 2002; Boscolo, Ariasi, Del Favero, & Ballarin, 2011; Flowerday & Shell, 2015; Guthrie

et al., 2007). Ainley, Hidi, and Berndorff (2002) demonstrated that eighth- and ninth-grade students' interest in expository texts varied across different topics, such as culture, biology, and physics. The researchers found the strongest preference for so-called culture topics, such as body image. In a further study, Ainley, Hillman, and Hidi (2002) examined whether students' interest in text topics varied according to the presented titles of literary texts. These researchers found that 10th-grade students' interest ratings differed significantly depending on the text topic, with higher interest in texts about action as compared with texts about love and relationships. Boscolo et al. (2011) conducted a study with upper secondary students and identified small effects of students' interest in the text topics (globalization vs. terrorism) on their text-based interest after reading the texts ( $\eta^2 = .02$ ). Flowerday and Shell (2015) reported that university students' interest in a specific text was directly related to the topic covered. However, text titles were evaluated instead of entire texts.

In contrast, fewer research findings are available when it comes to elementary school students. One survey of out-of-school reading by Clark and Foster (2005) showed that preferences for text topics were recognizable even in elementary school: Topics such as adventure stories, fantasy stories, ghost stories, and detective stories were generally popular with students, although there was also much between-student variation in topic-related interest. However, the researchers did not take further important text criteria into account, such as the text genre or protagonists' gender.

## **Gender of Protagonists**

Protagonists are also relevant for students' text-based interest because they provide learners with the opportunity to identify with characters, giving the texts personal relevance (Bortolussi & Dixon, 2003; Dixon & Bortolussi, 2008a; Schrijvers, Janssen, Fialho, & Rijlaarsdam, 2016). Gender is a crucial component of such identification processes and can be particularly relevant for younger students (Kessels, Heyder, Latsch, & Hannover, 2014; Perry, Pauletti, & Cooper, 2019; Ruble, Martin, & Berenbaum, 2006). Based on the gender matching hypothesis, which states that students are more interested in protagonists whose gender matches their own, interest in texts with female protagonists and texts with male protagonists can be assumed to be balanced when looking at boys and girls in combination (Dixon & Bortolussi, 2008b; Hogan, 1994).

There has been hardly any recent research on students' interest in texts with male versus female protagonists. A few experimental studies have examined whether students' text-based interest varied significantly based on the protagonist's gender (Bleakley, Westerberg, & Hopkins, 1988; Bortolussi, Dixon, & Sopčák, 2010). Both revealed that school students and university students enjoyed reading

texts with a male protagonist more so than texts with a female protagonist, partially contradicting the gender matching hypothesis. The effect size found by Bleakley et al. (1988) was rather small ( $d = 0.22$ ). In a further study, Ainley, Hillman, and Hidi (2002) did not find any systematic differences in 10th-grade students' interest in texts based on protagonists' gender. Nonetheless, the texts used differed in topic and content, making it hard to draw conclusions on the relevance of protagonists' gender for students' text-based interest. Furthermore, most of these studies did not focus on elementary school students.

## **Interest Related to Gender and Text Characteristics**

Among younger students, gender has been shown to be linked to motivational variables in reading (Logan & Johnston, 2009; Marinak & Gambrell, 2010; McKenna, Kear, & Ellsworth, 1995; Mullis et al., 2017). For example, the study by McKenna et al. (1995) revealed that female students in grades 1–6 had more positive attitudes toward reading in both recreational and academic contexts as compared with boys in these grades. Comparable results have been found for middle school students (McKenna et al., 2012; Swalander & Taube, 2007). Moreover, in many different countries, girls in elementary and middle school often report having higher intrinsic reading motivation as compared with boys (Brozo et al., 2014; Kelley & Decker, 2009; Lau, 2009; Marinak & Gambrell, 2010; McGeown et al., 2012; Mucherah & Yoder, 2008). Given that such gender differences are apparent not only in reading-related attitudes and reading motivation but also in text-based interest (Clark, 2019; McGeown et al., 2012; Merisuo-Storm, 2006), it seems important to gain deeper insights, theoretical explanations, and empirical findings on gender-specific differences in text-based interest.

Following theoretical frameworks and empirical studies, gender is an essential part of a person's identity and impacts attitudes, values, academic interests, and private interests (Eccles & Wigfield, 2002; Hyde, 2014; Kessels et al., 2014; McGeown et al., 2012; Perry et al., 2019). According to the interest as identity regulation model by Kessels et al. (2014), discrepancies between a learner's gender and stereotypical beliefs about a domain can negatively affect the learner's interest. Because reading is often considered to be a rather feminine-attributed activity in society (Plante, Théoret, & Favreau, 2009; Steffens & Jelenec, 2011), boys are more likely than girls to develop less interest in reading and reading material. Furthermore, gender-stereotypical beliefs among families, teachers, and peers have been shown to impact students' interest and other motivational variables in reading (Muntoni & Retelsdorf, 2018, 2019; Muntoni, Wagner, & Retelsdorf, 2021; Retelsdorf, Schwartz,

& Asbrock, 2015; Wolter, Braun, & Hannover, 2015). However, it is also important to consider that gender-typical associations are shaped by cultural norms and values, so differences may arise across countries and cultures (Eccles, 2005; Else-Quest, Hyde, & Linn, 2010; Nagy et al., 2008). Moreover, although gender is currently considered to be a fluid psychological construct, binary gender conceptualizations (male/female) have contributed to a better understanding of gender disparities in reading motivation (Egan & Perry, 2001; Hyde, Bigler, Joel, Tate, & van Anders, 2019; Logan & Johnston, 2009; McGeown & Warhurst, 2020).

Several studies have indicated that boys and girls differ in the extent of their interest in texts from narrative and informational text genres (Clark, 2019; Clark & Foster, 2005; McGeown et al., 2016; Nippold et al., 2005; Pfost, Artelt, & Weinert, 2013). McKenna et al. (2012) highlighted in a U.S. sample that reading attitudes among middle school students in grades 6–8 significantly differed by gender, with girls having more positive attitudes toward reading different text types, such as textbooks, novels, magazines, or comic books, in both academic and recreational contexts as compared with boys. Unfortunately, the researchers did not differentiate between text genres. Based on large-scale data from PIRLS, Brozo et al. (2014) revealed that girls reported a greater diversity in their reading preferences than boys.

McGeown et al. (2016) showed for a U.K. sample that fourth-grade students' engagement in reading different text genres was predicted by gender: Girls read fiction more often than boys, whereas boys spent more time reading factual books than girls. In a further study, McGeown, Duncan, Griffiths, and Stothard (2015) reported a similar finding for U.K. students ages 11–16, reporting that girls read narrative texts more often than boys did. In a U.S. sample, Parsons et al. (2018) confirmed some of these findings, at least for the narrative text genre. They revealed that girls in upper elementary school were significantly more interested in narrative texts than boys, whereas there were no significant gender differences in interest in informational texts. Moreover, Topping, Samuels, and Paul (2008) found that girls in U.K. grades 2–6 reported a significantly higher preference for reading fiction than their male peers. A study by Oakhill and Petrides (2007) revealed statistically significant gender differences in U.K. elementary students' interest in reading texts of different genres. It was shown that boys preferred factual books, as a type of informational texts, whereas girls favored storybooks, as a type of narrative texts. Based on Programme for International Student Assessment (PISA) data, Jerrim and Moss (2019) reported similar findings in secondary school, with girls reporting reading fiction more often than boys, but no gender gap in the frequency of reading nonfiction. In contrast, Duncan et al. (2016) did not find any significant differences in boys' and girls' text-based interest by genre for early adolescents in the United Kingdom.

Moreover, studies have revealed that topic interest and gender are closely linked, with boys and girls preferring different kinds of text topics (Ainley, Hillman, & Hidi, 2002; Coles & Hall, 2002; Davila & Patrick, 2010). Merisuo-Storm (2006) studied 10-year-olds' gender-specific topic preferences in a Finnish sample and found that boys preferred adventure and humorous books, whereas girls liked to read many types of texts. Clark and Foster (2005) evaluated children's and young people's reading preferences in the United Kingdom and found that boys were less likely to read about romance, relationships, or animals than girls were, whereas girls were less interested in war, crime, science fiction, and sports. However, the researchers also reported that boys and girls did not differ significantly in their interest in reading adventure, comedy, or ghost stories.

There has been far more research on secondary school students. Ainley, Hillman, and Hidi (2002) found that topic interest was significantly associated with students' gender in an Australian secondary school sample: Girls were more interested in all the presented topics than boys were, with the largest differences found for a text about love and relationships. The effect size was medium ( $\eta^2 = .11$ ). A national survey by Coles and Hall (2002) in the United Kingdom revealed that 10–14-year-old girls read texts about relationships and emotions, such as friendship or love stories, more often than boys did. In comparison, boys enjoyed reading books about science fiction, comedy, sports, or war more than girls did. Graham et al. (2008) highlighted that ninth- and 10th-grade boys and girls in Australia considered texts more interesting when the topic was more typical for their gender. The study focused on narrative texts and used a text about relationships as a typical female topic and a text about science fiction as a typical male topic. Interestingly, girls expressed an overall higher interest in the two topics as compared with boys, and differences in interest explained by gender were smaller for the male-attributed text topic than the female-attributed one.

For readers, protagonists facilitate identification and provide insights into the characters of the story (Dixon & Bortolussi, 2008a). The gender matching hypothesis (Hogan, 1994) suggests that students prefer reading texts about protagonists whose gender matches their own. Mohr (2006) confirmed this assumption in a U.S. sample, showing that first-grade students preferred texts with same-gender protagonists. Bortolussi et al. (2010) investigated whether female and male university students in Canada and Germany differed in their degree of interest in stories with female or male protagonists. The results showed that female and male students in both samples gave higher ratings to the story with male characters. However, this study was conducted with university students and was limited to text excerpts from novels rather than full texts. In contrast, Ainley, Hillman, and Hidi (2002) did not find any statistically significant interaction effects among 10th-grade students' gender, protagonists' gender, and text-based interest in an

Australian sample. However, the researchers did not simultaneously consider whether boys' and girls' text-based interest might have been affected by the text topic.

Taken together, research has highlighted that text-based interest is crucial. Both theoretical models and empirical findings suggest that students' interest in reading texts might systematically relate to certain text characteristics and to students' gender. However, the existing findings are heterogeneous. Furthermore, research has mostly examined only single text characteristics, so the relative importance of different text characteristics remains unclear. In addition, previous findings have been based on participants of various age groups. Experimental studies on the variables underlying students' text-based interest are scarce, and interaction effects between text and student characteristics have rarely been considered. In the present study, we addressed the outlined research gaps by systematically varying the texts under consideration.

## The Present Study

This study brings into focus the interplay between elementary students' text-based interest and several text characteristics, as well as students' gender, by implementing a study design with experimental variation of texts. Three research questions guided the study:

1. How is students' text-based interest related to (a) text genre, (b) less or more female-typed text topics, and (c) protagonists' gender?
2. In which way are text-based interest and students' gender related?
3. How is boys' and girls' text-based interest related to (a) text genre, (b) less or more female-typed text topics, and (c) protagonists' gender?

We expected main effects for text genre, text topic, and protagonists' gender to explain variance in students' text-based interest. Based on empirical findings showing that students prefer narrative texts over informational texts (e.g., Clark, 2019; Parsons et al., 2018), we assumed that students would have greater interest in narrative texts as compared with informational texts (hypothesis 1a). With respect to text topic, the less female-typed topic should be more interesting for students as compared with the more female-typed topic (hypothesis 1b). Based on the findings of Bortolussi et al. (2010), we expected students to exhibit higher interest in texts with male protagonists as compared with texts with female protagonists (hypothesis 1c). In line with theoretical assumptions (Kessels et al., 2014) and empirical findings (e.g., Clark, 2019; McGeown et al., 2016; Mullis et al., 2017) suggesting boys are less interested in reading, girls should report greater text-based interest as compared with boys (hypothesis 2). Similarly, we hypothesized that girls' text-based interest would

not be affected by text characteristics, whereas boys' interest would. Based on results by Jerrim and Moss (2019), McGeown et al. (2015), and McKenna et al. (1995), we assumed that girls would have higher interest in narrative texts than boys would, whereas informational texts should be comparably interesting for both boys and girls (hypothesis 3a). In line with findings demonstrating girls' interest in a wide range of text topics (e.g., Merisuo-Storm, 2006), we expected boys to be less interested in more female-typed text topics than girls would, whereas girls and boys should have a similar level of interest in texts with less female-typed topics (hypothesis 3b). Finally, based on females' more positive attitudes toward texts with male protagonists (Bortolussi et al., 2010), we assumed that girls and boys would show similar levels of interest in texts with male protagonists, whereas boys would be less interested than girls in texts with female protagonists (hypothesis 3c).

## Method

### Participants

Based on an a priori sample size calculation using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007), a sample of at least 480 participants with 30 students in each condition was required to identify small effect sizes ( $\alpha = .05$ ; power:  $1 - \beta = .95$ ; effect size = 0.25). A total of 504 fourth-grade students from 26 classes in 15 elementary schools took part in the study. Schools were distributed over large cities, small cities, and villages in North-Rhine Westphalia, Germany. Students' average age was 10.38 years ( $SD = 0.44$ ), and 47.4% were female. Approximately 18.9% of students had an immigrant background, which was operationalized based on the language spoken at home ("I sometimes speak German, but mostly another language at home," or "I never speak German at home").

Students' cultural capital was measured by the number of books at home (Evans, Kelley, Sikora, & Treiman, 2010; Mullis, Martin, Foy, & Drucker, 2012). Students were asked on a 5-point Likert-type scale about the number of books their families have at home (1 = 0–10 books, 2 = 11–25 books, 3 = 26–100 books, 4 = 101–200 books, and 5 = more than 200 books). The variable was dichotomized into the categories fewer than 100 books at home versus more than 100 books at home. Whereas 53.9% of students reported having fewer than 100 books at home, 42.4% of students reported having more than 100 books at home, which is comparable to the average reported number in representative elementary school samples in Germany (e.g., PIRLS 2016; Hußmann et al., 2017). Students' average reading performance ( $M = 38.52$ ,  $SD = 11.61$ ) (see the Measures subsection) was in accordance with normed average scores among fourth-grade students (Mayringer & Wimmer, 2003).

Pre-analyses revealed that girls and boys did not significantly differ in age ( $M_{\text{boys}} = 10.40$  years,  $SD = 0.75$ ;

$M_{\text{girls}} = 10.35, SD = 0.41, t(500) = 7.52, p \geq .05$ , or number of books at home ( $M_{\text{boys}} = 3.37, SD = 1.24; M_{\text{girls}} = 3.34, SD = 1.10, t(489) = -0.56, p \geq .05$ . Nor did boys and girls exhibit any differences regarding immigrant background ( $M_{\text{boys}} = 1.57, SD = 0.87; M_{\text{girls}} = 1.59, SD = 0.83, t(478) = -0.23, p \geq .05$ . However, statistically significant gender differences were found regarding reading competence. Girls performed better in the standardized reading assessment ( $M = 40.23, SD = 11.74$ ) than boys did ( $M = 36.93, SD = 11.27, t(505) = -3.23, p < .05$ . Therefore, reading competence was included as a control variable.

## Conditions and Design

The aim of the study was to explain students' text-based interest, which served as the central outcome variable, via text characteristics, students' gender, and the interaction between them. We used an experimental between-subject design with systematic text manipulation and randomized assignment of students to the eight text conditions to answer the research questions. We designed eight texts differing by text genre, text topic, and protagonists' gender. The texts had two possible values for each variable: text genre (0 = *informational*, 1 = *narrative*), text topic (0 = *less female-typed topic*, 1 = *more female-typed topic*), and protagonists' gender (0 = *male*, 1 = *female*). Additionally, students' gender was used as a further factor (0 = *boy*, 1 = *girl*).

We used a narrative text taken from a reading comprehension study in elementary schools (Schwabe & McElvany, 2013) as a template to create an analogous informational text. Whereas the narrative text was characterized by insights from protagonists and lively dialogue between characters, the informational text adopted the style of a newspaper article and focused on descriptions, facts, and quotes from interviews (see Table 1 for text excerpts). Additionally, we modified each text to be about a more female-typed topic (ballet) or a less female-typed topic (soccer). Whereas soccer is becoming increasingly popular among boys and girls in many countries, such as the United States (e.g., National

Federation of State High School Associations, 2019), in Germany, more boys (85.9%) than girls (14.1%) have soccer as a hobby and are more likely to join formal soccer teams (Deutscher Olympischer Sportbund, 2020). This demonstrates how gender-specific interests are often sensitive to cultural contexts. In contrast, girls and women are overrepresented in sports areas such as dance or ballet in many countries (Klomsten, Marsh, & Skaalvik, 2005; Klomsten, Skaalvik, & Espnes, 2004; Nielsen, Pfister, & Andersen, 2011). In Germany, most children who have dancing as a favorite hobby are girls (boys = 10.6%; girls = 89.4%; Deutscher Olympischer Sportbund, 2020). Thus, for the present study, we selected soccer as the less female-typed topic and ballet as the more female-typed topic. To test the assumption of gender-specific interests, we conducted a pilot study with fourth-grade students ( $N = 251$ ). Students were asked how much they would like to read a text about soccer, as an example of a less female-typed topic, or about ballet, as an example of a more female-typed topic, on a 4-point Likert-type scale (1 = *I do not agree at all*; 4 = *I agree completely*). Boys showed significantly higher interest in the topic of soccer ( $M = 2.81, SD = 0.95$ ) as compared with girls ( $M = 2.50, SD = 0.95, t(247) = 2.62, p < .05$ . Girls reported being more interested in the topic of ballet ( $M = 2.28, SD = 0.99$ ) than boys did ( $M = 1.43, SD = 0.69, t(260) = -8.05, p < .05$ ).

The protagonists' gender was varied across all eight texts so the number of texts with female protagonists and with male protagonists was the same. Moreover, common children's names were used as the names of protagonists in the texts. The eight texts had equivalent sentence structure, length (from 160 to 168 words), and language complexity. We used the readability index language program Lesbarkeitsindex-LIX (Lenhard & Lenhard, 2014–2017) as an objective indicator for text difficulty. To calculate a LIX readability index between 15 (easy) and 80 (difficult), we checked each text for its linguistic surface structure based on the number of prepositions, organizational structures, conjunctions, and words. On average, the texts were of medium complexity ( $M = 37.88, SD = 6.92$ ) and

**TABLE 1**  
Texts With Systematic Text Variation

Text	Text genre	Text topic	Protagonist	Extract
1	Narrative	More female-typed	Female	Sofie's favorite hobby was dancing ballet.
2			Male	Leon's favorite hobby was dancing ballet.
3		Less female-typed	Female	Sofie's favorite hobby was playing soccer.
4			Male	Leon's favorite hobby was playing soccer.
5	Informational	More female-typed	Female	Many girls enjoy dancing ballet.
6			Male	Many boys enjoy dancing ballet.
7		Less female-typed	Female	Many girls enjoy playing soccer.
8			Male	Many boys enjoy playing soccer.

were adequate for students in grade 4 (Lenhard & Lenhard, 2014–2017).

## Measures

To assess students' texts-based interest as a subform of situational interest, we adapted a well-established scale from the German national supplementary tests in PISA 2000 (Kunter et al., 2002). The scale by Kunter et al. (2002) exhibited a very good reliability in the original study (Cronbach's  $\alpha = .97$ ) and in further studies (e.g., Cronbach's  $\alpha = .98$ : McElvany, Ohle, El-Khechen, Hardy, & Cinar, 2017; Cronbach's  $\alpha$  ranging from .83 to .88 across different texts: Schaffner, Schiefele, & Schneider, 2004). In the current study, we slightly modified the text-based interest scale by adding one item (see Table 2). Students reported their interest on a 4-point Likert-type scale (1 = *I do not agree at all*; 4 = *I agree completely*). Reliability analyses showed that the scale had a very good internal consistency in the full sample (Cronbach's  $\alpha = .94$ ) and for the subgroups of boys and girls (boys: Cronbach's  $\alpha = .96$ ; girls: Cronbach's  $\alpha = .94$ ). Moreover, text-based interest was significantly correlated with general interest in reading ( $r = .33$ ) in the present study and was weakly related to reading comprehension ( $r = .16$ ) in the study by Schaffner et al. (2004).

To account for differences in reading competence, we used a standardized assessment of basic reading skills (Salzburg Reading Screening 1–4; Mayringer & Wimmer, 2003). In this test, students had five minutes to read as many sentences out of 70 sentences as possible and to decide whether the content was true or false (e.g., Bananas are blue). The reliability was very good (Cronbach's  $\alpha = .97$ ).

## Data Collection

The study was administered by trained research assistants following a standardized testing manual. Data were collected in the classrooms of participating grade 4 classes. Participation in the study was voluntary, and parental consent was obtained for each student beforehand. Due to the experimental study design, the students were randomly

assigned to the eight experimentally varied texts on individual student level. Consequently, variables such as gender, age, and immigrant background and not explicitly assessed variables, such as individual interest or prior knowledge with respect to the topics, were assumed to be equal across groups. The number of students per text texts was roughly equally distributed ( $M = 64.38$ ,  $SD = 4.07$ ; 57–67 students per text). In terms of gender, the percentage of boys per text was 52.2% on average and ranged from 48.5% to 55.6% across the texts. There were no significant differences between the students in the eight texts with respect to gender,  $F(7, 502) = 0.38$ ,  $p \geq .05$ , or age,  $F(7, 516) = 1.51$ ,  $p \geq .05$ . Moreover, students in the eight text conditions did not statistically differ in terms of number of books at home (ranging from  $M = 3.23$ ,  $SD = 1.19$ , to  $M = 3.51$ ,  $SD = 1.15$ ),  $F(7, 483) = 0.69$ ,  $p \geq .05$ . Likewise, students in the eight text conditions did not statistically differ in their reading competence,  $F(7, 506) = 1.82$ ,  $p \geq .05$  (ranging from  $M = 35.46$ ,  $SD = 19.84$ , to  $M = 41.75$ ,  $SD = 12.31$ ).

First, each student received only one of the eight texts and read it carefully. Then, students immediately reported on their interest in the text they had read. Finally, they completed the standardized reading assessment and provided background information, such as gender, age, language spoken at home, and number of books at home. The survey took about 30 minutes in total.

## Data Analysis

We conducted all analyses with IBM SPSS Statistics 25 and *Mplus8* (Muthén & Muthén, 1998–2017) and specified structural equation models to answer the research questions. Due to the nested structure of the data, we used class affiliation as a cluster variable. The *type = complex* option was selected to correct standard errors. To test measurement invariance of the latent construct text-based interest across gender, we used the change in comparative fit index ( $\Delta CFI$ ) for model comparison. According to Cheung and Rensvold (2002), measurement invariance is given when  $\Delta CFI$  is not greater than  $-.01$ . The analyses revealed that scalar invariance was given for text-based interest as the latent outcome variable across boys and girls (see Table 3).

In the first model, we specified the text characteristics text genre, text topic, and protagonists' gender as independent variables and used text-based interest as the latent outcome variable. A second model included students' gender as a further independent variable explaining variance in text-based interest in addition to the three text characteristics. To investigate two-way interactions between students' gender and each of the three text characteristics, we specified a third model with interactions as dummy-coded variables. In all models, we included reading competence as a control variable because of significant gender differences. We evaluated the model fit using the chi-square test statistic, CFI, root mean square error of approximation (RMSEA; Hu &

**TABLE 2**  
**Items of the Text-Based Interest Scale**

Item number	Item
1	The text is interesting.
2	Reading the text was fun for me.
3	The text is exciting.
4	I would also enjoy reading the text in my leisure time.
5	I enjoyed reading the text.

Note. Translations of the modified items were adapted from Kunter et al. (2002). Item 5 was added in this study.



**TABLE 3**  
Measurement Invariance Testing for Interest Across Gender

Model	$\chi^2$ ( <i>df</i> )	<i>df</i>	<i>p</i>	CFI	RMSEA	SRMR	Comparison	$\Delta$ CFI	$\Delta$ RMSEA
1. Configural	46.21	10	.00	.98	0.12	0.02			
2. Metric	56.47	14	.00	.98	0.11	0.05	2 vs. 1	0.00	0.01
3. Scalar	67.90	18	.00	.98	0.10	0.04	3 vs. 2	0.00	0.01

Note. *N* = 510; 266 boys, 244 girls. CFI = comparative fit index; *df* = degrees of freedom; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

Bentler, 1999), and the standardized root mean square residual (SRMR). Missing data were below the 1% level and distributed at random. We used full information maximum likelihood to handle missing data and interpreted effects as statistically significant when  $p < .05$ , as marginally significant when  $.05 \geq p \leq .10$ , and as not significant when  $p > .10$ .

## Results

### Descriptive Statistics and Correlations

Descriptive results are presented in Table 4. The analysis revealed that students rated the narrative text with the less female-typed topic and male protagonists as most interesting ( $M = 3.01, SD = 0.83$ ). Students were least interested in the informational text with the more female-typed topic and female protagonists ( $M = 2.01, SD = 0.94$ ). Moreover, we found that students' interest in the text was significantly correlated with their gender, the text genre, and the text topic (see Table 5). Thus, girls tended to have higher interest ratings than boys, and students of both genders were more interested in the narrative text and the less female-typed text topic. The correlations between students' interest in the texts and students' gender, text topic, and text genre were weak. No statistically significant correlation between students' interest and protagonists' gender was found.

**TABLE 4**  
Descriptive Statistics for Students' Text-Based Interest

Variable	Characteristic	$M_{total}$ ( <i>SD</i> )	$M_{girls}$ ( <i>SD</i> )	$M_{boys}$ ( <i>SD</i> )
Text genre	Narrative	2.57 (0.96)	2.71 (0.91)	2.45 (0.98)
	Informational	2.39 (0.95)	2.64 (0.89)	2.15 (0.95)
Text topic	More female-typed	2.15 (0.94)	2.52 (0.93)	1.82 (0.81)
	Less female-typed	2.82 (0.86)	2.83 (0.84)	2.82 (0.87)
Protagonists' gender	Female	2.44 (0.97)	2.70 (0.92)	2.16 (0.95)
	Male	2.52 (0.95)	2.65 (0.89)	2.44 (0.98)
Total		2.48 (0.96)	2.68 (0.90)	2.30 (0.97)

Note. Text-based interest on a 4-point scale ranging from 1 (*low interest*) to 4 (*high interest*).

**TABLE 5**  
Bivariate Correlations

Variable	1	2	3	4	5	6
1. Text-based interest	—					
2. Students' gender <sup>a</sup>	.19*	—				
3. Text genre <sup>b</sup>	.10*	-.01	—			
4. Text topic <sup>c</sup>	-.36*	-.01	-.04	—		
5. Protagonists' gender <sup>d</sup>	-.04	.06	-.01	-.03	—	
6. Reading competence	-.03	.14*	.07	-.02	.07	—

<sup>a</sup>0 = male, 1 = female. <sup>b</sup>0 = informational, 1 = narrative. <sup>c</sup>0 = less female-typed topic, 1 = more female-typed topic. <sup>d</sup>0 = male, 1 = female. \* $p < .05$ .

### Text Characteristics and Interest in Texts

The first model ( $\chi^2 = 45.43, df = 21, p < .05; CFI = .99, RMSEA = 0.05, SRMR = 0.02$ ) revealed statistically significant relations between text-based interest and two of the three text factors when basic reading competences were taken into account as a control variable (see Table 6). Text-based interest was significantly related to text genre, with

**TABLE 6**  
**Results of Structural Equation Models**

Variable	Text-based interest					
	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Genre <sup>a</sup>	0.09*	0.05	0.09*	0.05	0.10*	0.04
Text topic <sup>b</sup>	-0.36*	0.04	-0.36*	0.04	-0.36*	0.04
Protagonists' gender <sup>c</sup>	-0.05	0.04	-0.06	0.04	-0.05	0.04
Reading competence	-0.04	0.03	-0.07*	0.03	-0.06	0.03
Students' gender <sup>d</sup>			0.20*	0.04	0.20*	0.04
Students' Gender × Text Genre					0.06	0.05
Students' Gender × Text Topic					0.19*	0.05
Students' Gender × Protagonists' Gender					0.09†	0.05

Note. SE = standard error.

<sup>a</sup>0 = informational, 1 = narrative. <sup>b</sup>0 = less female-typed topic, 1 = more female-typed topic. <sup>c</sup>0 = male, 1 = female. <sup>d</sup>0 = boy, 1 = girl.

\* $p < .05$ . † $p < .10$ .

students more interested in the narrative than the informational texts. Here, the effect size was small ( $\beta = 0.09$ ,  $p < .05$ ). Furthermore, text topic and text-based interest were associated with each other, with students reporting significantly higher interest in the texts with a less female-typed topic as compared with a more female-typed text topic. The effect size was medium ( $\beta = -0.36$ ,  $p < .05$ ). With respect to protagonists' gender, students reported similar levels of interest in texts with male and female protagonists. Therefore, text-based interest was statistically independent of protagonists' gender. Moreover, reading competence was not significantly associated with students' interest in the texts. In total, 14.6% of the variance in text-based interest was explained. The results were in line with hypotheses 1a and 1b, showing that students' text-based interest was significantly related to text genre and text topic. In contrast, hypothesis 1c was not supported by the data because no statistically significant differences in interest based on protagonists' gender were found.

### Gender, Text Characteristics, and Interest in Texts

Turning to the second model ( $\chi^2 = 58.34$ ,  $df = 25$ ,  $p < .05$ ; CFI = .98, RMSEA = 0.05, SRMR = 0.02), text-based interest was significantly related not only to text genre and text topic but also to students' gender ( $\beta = 0.20$ ,  $p < .05$ ). Girls reported significantly higher interest in the texts than boys

did. Moreover, reading competence was significantly related to interest in the texts ( $\beta = -0.07$ ,  $p < .05$ ). Students with better basic reading competences were less interested in the texts, but the effect size was very small. The model explained 18.5% of the variance in text-based interest. Although the effect size was small, the data supported hypothesis 2.

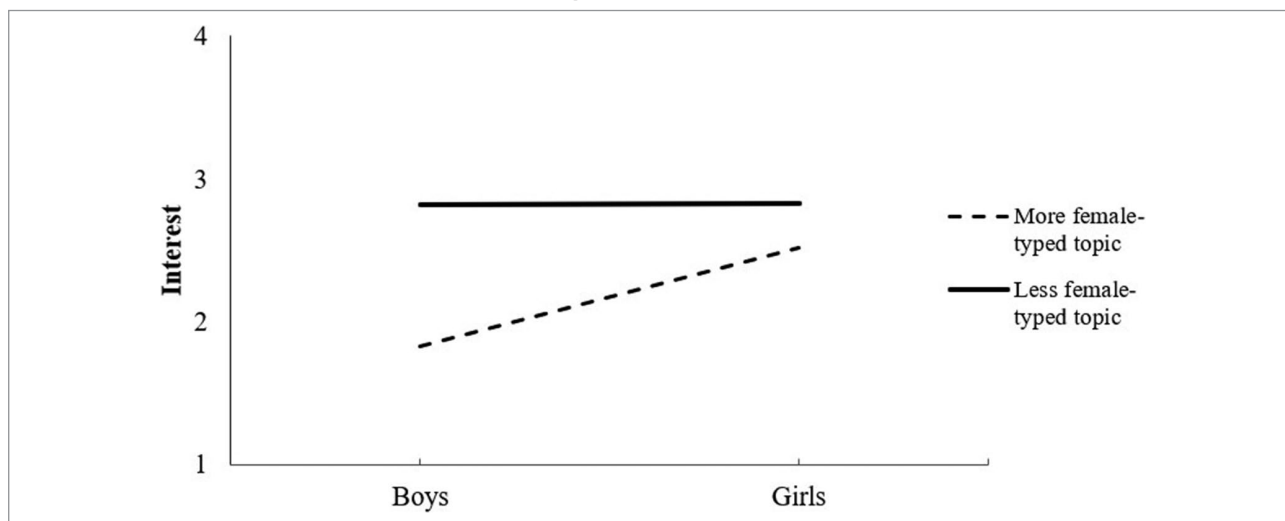
To test for interaction effects, we included interaction terms between students' gender and (a) text topic, (b) text genre, and (c) protagonists' gender in the analyses. The model fit indices were good ( $\chi^2 = 79.22$ ,  $df = 37$ ,  $p < .05$ ; CFI = .98, RMSEA = 0.05, SRMR = 0.02). The analyses revealed that the interactions between students' gender and text topic and between students' gender and protagonists' gender were statistically significant. Compared with boys, girls reported higher interest in the more female-typed text topic, whereas girls and boys were interested in the less female-typed text topic to a comparable extent (see Figure 1). The effect size was small ( $\beta = 0.19$ ,  $p < .05$ ). The interaction between students' gender and protagonists' gender was statistically significant, albeit marginally ( $\beta = 0.09$ ,  $p < .10$ ). Whereas boys were interested in the texts with female protagonists to a lesser degree than girls were, there were only small differences between girls and boys regarding their interest in texts with male characters (see Figure 2). No statistically significant interaction between students' gender and protagonists' gender was found. Thus, girls and boys reported similar interest in narrative and informational texts. Reading competence was not significantly related to text-based interest. In total, 23.2% of the variance in text-based interest was explained in this model. To sum up, whereas hypothesis 3a was rejected by the data, hypotheses 3b and 3c were supported.

## Discussion

Text-based interest represents an important reason for intrinsically motivated reading, which in turn is a key competence and crucial prerequisite for academic success and participation in society. Broadening prior research on variables underlying text-based interest, in this study, we investigated whether elementary school students' text-based interest would vary systematically depending on text-related factors, students' gender, and interactions between the two. Most previous studies of text-based interest have focused solely on single text characteristics and have only rarely examined gender effects (Fulmer & Frijters, 2011; Hidi & Renninger, 2006; Soemer & Schiefele, 2019). Furthermore, not only were these studies restricted to text titles or text extracts, but they also rarely considered elementary school students.

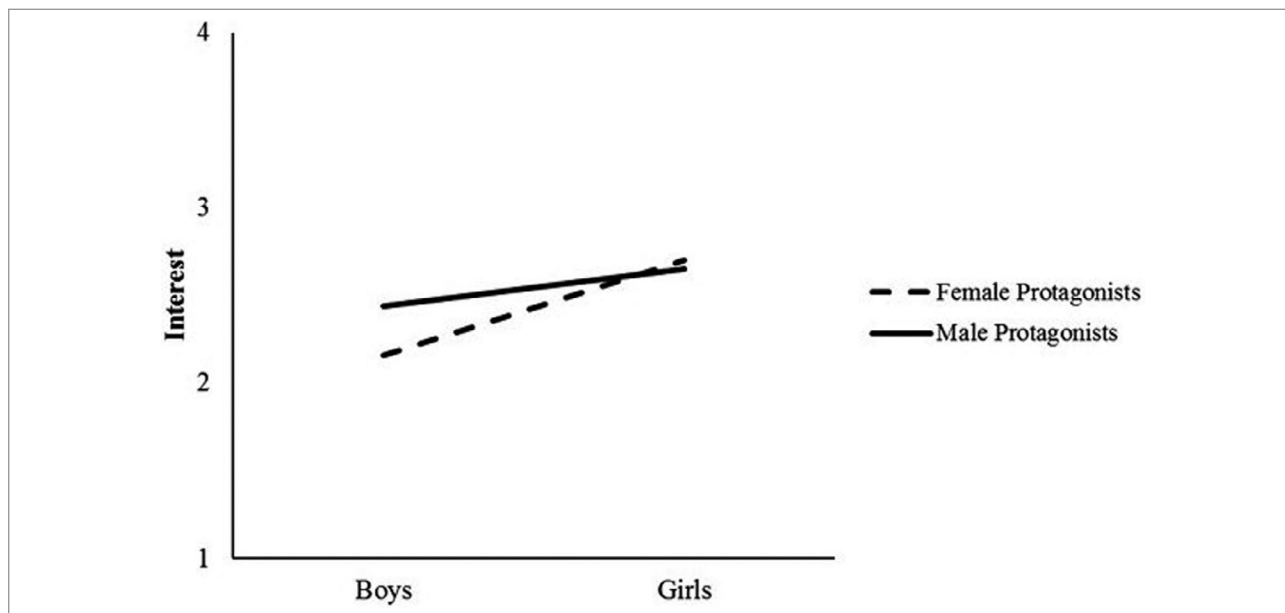
By systematically varying the texts under consideration, in the current study, we emphasized the relevance of text characteristics and students' gender for motivational facets in reading. More specifically, the results revealed that

**FIGURE 1**  
Interaction Between Students' Gender and Text Topic



Note. Text-based interest depending on text topic among boys and girls.

**FIGURE 2**  
Interaction Between Students' Gender and Protagonists' Gender



Note. Text-based interest depending on protagonists' gender among boys and girls.

students' text-based interest was significantly related to the text genre and text topic. In line with previous research focusing on middle school students or students of mixed-age groups (Clark, 2019; Clark & Foster, 2005; McKenna et al., 2012; Pfof, Artelt, & Weinert, 2013), the present results showed that text genre was associated with differences in elementary students' text-based interest. The finding can also be interpreted considering existing studies showing that students are often more familiar with narrative texts as compared with nonfictional texts in the school

context and leisure time reading (e.g., Clark, 2019; Guthrie, Wigfield, & Klauda, 2012; Locher et al., 2019; Parsons et al., 2018). Additionally, genre-specific features of narrative texts, such as dialogue or insights into protagonists' feelings and thoughts, may make such texts more vivid, further increasing elementary learners' text-based interest.

Text topic was a further important text-related factor for students' interest in texts. The students in the study were more interested in a less female-typed text topic as compared with a more female-typed text topic, highlighting that

students have clear topic preferences. The role of topic for text-based interest has been previously emphasized in studies that did not vary the texts experimentally (e.g., Ainley, Hidi, & Berndorff, 2002; Merisuo-Storm, 2006). No statistically significant differences in text-based interest were found based on protagonists' gender. It stands to reason that other characteristics of protagonists, such as character traits, might outweigh the role of protagonists' gender.

In accordance with previous research findings, gender differences in text-based interest were statistically significant (e.g., Ainley, Hidi, & Berndorff, 2002; Graham et al., 2008; Marinak & Gambrell, 2010). The study revealed that elementary school girls experienced greater interest when encountering texts than boys did. Therefore, the findings align with the general picture that girls enjoy reading more, have more positive attitudes toward reading, and read more often than boys do (McGeown et al., 2015; McKenna et al., 1995, 2012; Sainsbury & Schagen, 2004).

Expanding previous work on the relation between students' gender, text-related factors, and text-based interest, significant interaction effects were found. Text-based interest was associated with interactions between students' gender and text topic and between students' gender and protagonists' gender. The results showed that boys were more selective in their text-based interest as compared with girls, exhibiting less text-based interest when encountering a more female-typed text topic or texts with female protagonists. In contrast, girls showed comparable levels of interest in topics that were more and less female-typed. However, the interaction between students' gender and protagonists' gender was only marginally significant. The present findings support previous research results revealing gender differences in interest in texts with rather male-typed topics and texts with male protagonists (Ainley, Hillman, & Hidi, 2002; Bortolussi et al., 2010; Merisuo-Storm, 2006). In sum, girls might have a wealth of experience in reading a broad variety of texts and thus be more open-minded about the texts they read.

The findings emphasized that text characteristics are related to differences in text-based interest, thus demonstrating the role of situational factors for text-based interest, as defined in interest theories (Hidi & Renninger, 2006; Krapp, 2007; Schiefele, 2009). Moreover, we investigated the relevance of gender as one important individual characteristic of students and found significant differences in text-based interest between boys and girls. The current findings might be partly explained by girls' and boys' reading socialization, as well as sanctioning behavior by peers regarding gender-related reading preferences (Plante et al., 2009; Steffens & Jelenec, 2011). In line with the theoretical assumptions of the interest as identity regulation model (Kessels et al., 2014) and prior empirical findings, boys' attitudes toward reading and especially their interest in texts might be negatively affected by the stereotype that reading is considered a more feminine

domain in school (Muntoni & Retelsdorf, 2018; Retelsdorf et al., 2015). Girls, meanwhile, have higher intrinsic reading motivation and are less affected by discrepancies between their own gender and reading-related stereotypes. Girls thus seem to be interested in many different types of texts, even those with a less female-typed topic or male protagonists. Moreover, stereotypical expectations by peers may push boys to act according to gender expectations. In this respect, it could also be of relevance that cross-gender behavior is sanctioned more rigorously in boys' peer groups than in girls' (Fabes, Martin, & Hanish, 2003; Kessels, 2005). In the domain of reading, social sanctions from peers might be higher for boys if they choose to read a text on a more female-typed topic than for girls enjoying reading about a rather male-typed topic.

### **Strengths and Limitations**

In the current study, we used a strong design with eight experimentally designed texts to examine effects of specific text characteristics on students' interest in reading texts. This approach can be regarded as innovative, as few experimental or quasi-experimental studies have been conducted on the role of text characteristics for students' text-based interest. Furthermore, the study design included multiple text characteristics that have rarely been investigated simultaneously. Thus, new findings on the complex interplay between text-based interest, multiple text characteristics, and students' gender were obtained. Given that students' reading motivation declines after graduating from elementary school, the development of interest in reading material is of vital importance (McKenna et al., 1995; Miyamoto, Murayama, & Lechner, 2020). This is especially important in countries such as Germany where the transition to secondary school usually takes place after fourth grade. It has also been shown that the relation between reading-related motivational factors and reading competence was stronger for elementary students than secondary school students (Petscher, 2010). Therefore, the present study was conducted at an important transition stage within students' school careers, making it even more relevant to understand which factors underlie differences in text-based interest among students in this age group. In addition, we measured text-based interest with a reliable instrument, and our sample size was large.

Nonetheless, the present study also has limitations that need to be discussed. Methodologically, the choice of gender-related topics could be debated. Data were collected during the 2018 Men's FIFA World Cup, during which soccer was a highly present topic in society and for children regardless of gender. Although soccer is a more frequent hobby among boys than girls in Germany (Deutscher Olympischer Sportbund, 2020), the increased public attention paid to soccer during this period might have contributed to smaller gender differences than we expected. Therefore, topic effects might be underestimated in this study. Nevertheless, the results are

in line with girls having higher motivation to read in general and being more interested in a wide range of text materials, including different genres and topics (e.g., Brozo et al., 2014; Merisuo-Storm, 2006). Previous studies have also found smaller differences in interest between male and female middle school students with respect to male-attributed text topics than female-attributed ones (Graham et al., 2008). Moreover, further variables, such as students' socioeconomic status (SES), may impact the interactions between text-based interest and text topic as well. It is plausible that specific text topics, such as ballet, are more well represented in higher SES milieus and others more common in lower SES milieus. Therefore, topics such as personal relationships, romance, and love could serve as alternative female-typed text topics, as these topics are of interest for many girls regardless of SES (Ainley, Hillman, & Hidi, 2002; Clark & Foster, 2005). Hence, future studies should replicate the present study using a wider range of topics, perhaps including relationships as a more female-typed topic and rugby or boxing as more male-typed topics. Topics could also be compared along a continuum from more to less gender-typical topics. Furthermore, interest in topics can significantly vary among boys and girls depending on cultural background, as seen in the example of interest in soccer in the United States as compared with Germany.

A further aspect refers to the assessment of text difficulty in this study. Although we ranked the texts using an index of text complexity, it would also be crucial to assess students' perceived text difficulty while reading to take between-student differences into account (Fulmer, D'Mello, Strain, & Graesser, 2015; Fulmer & Tulis, 2013). Referring to the current discussion on gender as a fluid psychological construct, future studies could also assess students' identification with male or female gender to raise awareness of gender diversity in research and practice (McGeown & Warhurst, 2020; Perry et al., 2019). Although several research findings support the assumption of gender-related differences in text-based interest (Ainley, Hillman, & Hidi, 2002; Graham et al., 2008), more research on the relations between person- and text-related factors as determinants of text-based interest is required.

The present study greatly expands previous work on students' text-based interest as an important motivational variable by examining important text characteristics. The study yielded both gender-specific and cross-gender results with relevant implications for future research and educational practice. However, when interpreting the results and identifying possible implications, the fact that effect sizes were only small to medium should be considered.

### ***Implications for Research and Practice***

First, future research should replicate the current findings on students' text-based interest and its relation to relevant person- and text-related factors. In future studies, it would be desirable to use multiple texts per experimental

condition to confirm the general relevance of text characteristics for girls' and boys' text-based interest. Moreover, a wider spectrum of topics from various subject areas could be included. For example, topics that widely attract girls' interest, such as the more female-typed topics of relationships and love, should be considered (e.g., Ainley, Hillman, & Hidi, 2002; Clark & Foster, 2005). Examining students' perceptions of the relevance of text topics could provide deeper insight into underlying mechanisms of variation in text-based interest depending on the text topic (Hidi & Renninger, 2006; Krapp, 2002; Schiefele, 2009). Specifically, individual interest in the topics could be assessed before reading the texts to investigate the unique contribution of individual interest to situational interest in greater depth (e.g., Ainley, Hillman, & Hidi, 2002; Knogler, Harackiewicz, Gegenfurtner, & Lewalter, 2015; Tsai, Kunter, Lüdtke, Trautwein, & Ryan, 2008). Moreover, it would also be relevant to ask about students' prior knowledge of each topic and familiarity with different text genres to explain interest via rather stable factors.

In addition, further relevant characteristics, such as text complexity, could be investigated as predictors of text-based interest. Here, students' perceived text difficulty should be particularly relevant for text-based interest (Fulmer et al., 2015; Fulmer & Tulis, 2013; Soemer & Schiefele, 2019). Furthermore, it would be interesting to investigate whether genre-specific characteristics of informational texts, such as integrated tables and graphics, could have a greater effect on interest in certain text genres. Additionally, the text characteristics of text genre, text topic, and protagonists' gender could be relevant not only for text-based interest but also for the effort invested in reading texts. Further studies could also investigate whether the results also remain robust among older students.

High reading motivation is valuable, as it encourages reading activity and reading competence and leads people to view reading as a positive activity (Retelsdorf, Köller, & Möller, 2011; Strømsø & Bråten, 2009; Stutz, Schaffner, & Schiefele, 2016; Troyer, Kim, Hale, Wantchekon, & Armstrong, 2019). Regarding students' text-based interest, research has also shown that higher interest in texts facilitates reading comprehension (Amendum, Conradi, & Hiebert, 2018; Clinton & van den Broek, 2012; Graham et al., 2008). However, only a few studies have investigated the interaction among gender, intrinsic reading motivation, and reading comprehension (Logan & Medford, 2011; Oakhill & Petrides, 2007; Stutz et al., 2016). Some studies revealed that boys' reading performance was more strongly related to motivational variables in reading as compared with girls' performance (Logan & Medford, 2011; Oakhill & Petrides, 2007). With respect to text-based interest for elementary-age boys and girls, Lepper, Stang, and McElvany (2021) showed that it was differently related to students' comprehension of the respective text, with stronger relations for boys than for girls. It is also plausible that text-based interest could mediate effects between text

characteristics and reading comprehension among boys and girls. Against this background, the question of whether text-based interest and text characteristics contribute to reading comprehension of boys and girls should be given greater weight in future research, at least because of its practical relevance in reading promotion.

With respect to classroom instruction, both the overall variation and systematic differences imply that students' interest should be encouraged through a wide range of books and reading materials (Brozo et al., 2014; Brozo, Shiel, & Topping, 2007; Guthrie et al., 2007). Given that students' reading motivation shows a degree of malleability, a child-centered selection of texts may encourage both girls' and boys' interest in reading (McGeown et al., 2012; Wigfield, Guthrie, Tonks, & Perencevich, 2004). In particular, teachers are entrusted with providing interesting reading material to students. The present findings underscore that certain text characteristics are significantly related to students' interest in texts and might help motivate students to read a given text. The findings indicated that the text topic was an important factor for students' text-based interest. Given that students showed variation in their preferences regarding text topics, teachers should be aware of students' heterogeneity of text-related interests (Clark, 2019; McGeown et al., 2015). Moreover, the study revealed that boys and girls reported incongruent interests regarding text topic and protagonists' gender. Therefore, including incentivizing texts in a teaching unit that differ in topic and protagonists' gender but have the same level of difficulty would allow students to freely choose what they would like to read. This would also meet students' basic need to experience autonomy (Patall, 2013; Ryan & Deci, 2017). Despite the gender-specific interests reported in this study, there was also a large degree of overlap between boys and girls. Therefore, teachers may ask students for topic suggestions and ensure a balanced selection of texts with respect to male and female protagonists, for example, to ensure that as many students as possible are interested in the reading material.

Providing new reading stimuli also seems essential to broaden students' spectrum of interest (Brozo et al., 2007; Wigfield et al., 2008). Encountering new texts about rather unfamiliar topics or different text genres could trigger students' text-based interest and curiosity about reading the new material. Another aspect is varying the media used for reading. Digital texts may present new possibilities to respond to students' variety of interests and implement differentiated reading instruction in class (Duncan et al., 2016; Kao, Tsai, Liu, & Yang, 2016; McKenna et al., 2012). This may also help reduce gender gaps in digital reading (McElvany & Schwabe, 2019; Mullis et al., 2017). If these approaches can help promote students' text-based interest, they might conceivably have positive effects on individual interest and, thus, on reading behavior and reading competence in the long term (Hebbecke et al., 2019; Hidi & Renninger, 2006; Miyamoto et al., 2019).

## Conclusion

The present study augments current research by delivering important findings on the variables underlying differences in students' text-based interest. Systematically varying texts with respect to relevant text characteristics, such as text genre, text topic, and protagonists' gender, resulted in general and gender-specific findings on students' text-based interest. The study identified new research desiderata concerning the interplay between text- and person-related factors and text-based interest. The study also provides potential starting points for better supporting students' reading motivation. In conclusion, gender-specific patterns in reading interests exist and should be paid more attention in educational practice and research.

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