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READING INTEREST IN A DIGITAL AGE

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The era of "digital literacy" raises the question of whether the meaning of reading interest may have changed. This study examined psycho-behavioral dimensions of reading interest as these relate to different reading modes and different purposes of reading. Findings show that reading interest is best represented by its subcomponents of psycho-behavioral dimensions. Higher-order factor structures indicate a general factor of reading interest at the third-order level and five second-order factors representing reading in print settings, online reading, social media reading, academic reading, and recreational reading. We conclude with implications for future research on the psychological meaning of reading.

Recent advances in information and communication technology (ICT) have substantially changed the way we read[1] on a daily basis as the use of various computer devices and online applications ushered in an era of "digital literacy" (Gilster, 1997, p. 1). As a result, reading of printed text materials has been increasingly replaced by digital forms of reading (Buzzetto-More, Guy, & Elobaid, 2007; Coiro, 2011). These include reading of digital texts that can only be accessed online (e.g., social media), as well as those that are read off a computer screen (e.g., static, non-interactive forms such as e-books and PDF files). A study of 3,866 undergraduate students in the United States reported that, on average, they used social media sites 6 times per day and spent

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[1]In the present study "reading" is operationally defined as activities of reading involving texts of sentences or more than two words that carry a sentence-level meaning. It excludes reading a string of words that can be treated as one word (e.g., the name of a food).

106 minutes daily doing so (Junco, 2012). Another survey of 1,265 US undergraduate students showed that they spent about 9 hours per week on the Internet (Huang, Capps, Blacklock, & Garza, 2014). It has also been reported that the majority (98%) of Canadian youth spends at least one hour or more on the Internet for various purposes; 50% spend at least 2 hours per day, and 20% five hours or more (Bibby, Russell, & Rolheiser, 2009). These findings indicate an increasing trend towards reading in Internet-based rather than print settings. It is expected that the development of more diverse online applications will further change the reading habits of current and future generations.

While reading in traditional, print-based settings is becoming less common, it has not completely disappeared. Most people alternate between print-based and online reading according to preference, interest, and convenience (Liu, 2005). Multimodal literacy is becoming the norm (Leu, Kinzer, Coiro, & Cammack, 2004). Yet relatively little research attention has been paid to whether what people find interesting to read differs across different modalities of reading. In other words, are there differences in the psycho-behavioral aspects of reading interest between print-based and online text?

The primary aim of the present study was to investigate the psycho-behavioral aspects of reading interest. The two central research questions were: (a) What psycho-behavioral aspects of reading are the basic components of reading interest? and (b) Do the identified psycho-behavioural dimensions of reading interest differ between print-based and online reading? In the literature on reading interest, extensive research has focused on certain psychological and behavioral constructs (Hidi, Renninger, & Krapp, 2004) and attitudes (Buzzetto-More et al., 2007). These constructs entail broadly-defined affective (Hidi et al., 2004; Silvia, 2008), cognitive (Hidi, 1995; Ryan & Deci, 2000), and behavioral components (Krapp, 1999; Shernoff, Csikszentmihalyi, Shneider, & Shernoff, 2003). Reading interest research, especially studies involving student populations, also recognizes differences in the purposes of student reading, and a distinction is often made between academic and recreational reading (Gallik, 1999; McKenna, Conradi, Lawrence, Jang, & Meyer, 2012). Thus, in this study reading interest was examined

from three main perspectives: psycho-behavioral aspects, reading modes, and reading purposes.

Mode of Reading

Reading mode (also called format, form, context, environment, or setting) refers to the medium in which text for reading is presented (Liu, 2005; McKenna et al., 2012). The extant literature typically distinguishes traditional, print-based and digital, computer-based reading modes. Printed text materials usually involve sentences, scripts, or passages printed on a piece of paper (Foltz, 1996; McKenna et al., 2012), and an underlying assumption is that readers follow a linear sequence of texts that are presented from top to bottom. Although readers of printed materials may skip sections or adopt some cognitive strategies to increase efficiency in reading, it is typically not expected that they would retrieve additional information from elsewhere at the same time (Foltz, 1996).

Digital reading (also referred to as online or Internet-based text reading) is defined as computer screen-based reading of texts that are obtained (e.g., e-book) or available (e.g., online newspaper) through Internet networks (Coiro, 2011). It ranges from reading hypertexts to reading texts involving a more complex, open-ended information system such as hyperlinks and hypermedia (Coiro, 2011). In the early 1990s, reading online texts was seen as an alternative mode of reading (Leu et al., 2004), but it is now seen as a prominent mode of reading, especially for younger generations (Bibby et al., 2009; Liu, 2005). Among university students in developed countries, reading in an online environment has become more common than reading in traditional, print-based settings (e.g., Bibby et al., 2009; Buzzetto-More et al., 2007). Buzzetto-More et al.'s (2007) study of U.S. college students ($N = 261$) found that only 6% reported that they "mind reading off a computer screen" and only 8% do "not like reading off a computer screen" (p. 244).

While the transition to online reading is evident, it appears that people's decisions about mode of reading can also be influenced by their main purposes of reading. For example, the students in Buzzetto-More et al.'s (2007) study preferred to use print-based materials when they had to read long passages or

engage in learning. More than half (58%) agreed that "when I need to read a long passage that is on the computer, I usually print out a copy" and 54% agreed that "when reading, I prefer hardcopy to a digital format" (p.244).

Purpose of Reading

Purpose of reading has long been a topic of reading research (Herculane, 1961; Letson, 1959; Samuels & Dahl, 1975). Reading purpose is defined as the reason or intention for which reading activity is performed (McKenna et al., 2012; Mokhtari & Reichard, 2008). It has been traditionally studied in association with reading material (Letson, 1959), reading rate (Samuels & Dahl, 1975), reading strategies (Mokhtari & Reichard, 2008), reading instruction (Blanton, Wood, & Moorman, 1990), and reading comprehension (Mills, Diehl, Birkmire, & Mou, 1995). These studies typically distinguish between reading for academic and recreational purposes (Buzzetto-More et al., 2007). Some researchers (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012), however, argue that this distinction can become blurred, since academic reading can easily generate pleasure and recreational reading can be informative and therefore somewhat 'academic' in nature. Thus, in the present study, reading for academic purposes is defined as reading with the aim of improving one's academic knowledge and skills (De Naeghel et al., 2012). Reading activities can be voluntarily chosen (for the pleasure of learning) or assigned by authority figures such as teachers, tutors, or parents. For students, school activities such as assignments, report writing or completing coursework tasks are usually designed and assigned by teachers, and their outcomes monitored via term-papers, examinations, and course grades. That is, academic reading in a school/university context involves reading tasks that need to be completed in a certain time frame and there is usually an evaluation of what they have learned from their reading.

In contrast, reading for recreational purposes involves non-mandatory, self-driven activities that are usually done in free time and out-of-school context (McKenna et al., 2012). Recreational readers freely choose what and when to read (De Naeghel et al.,

2012; Krashen, 2005). In reading research, different terms have been used to refer to this type of reading: recreational reading (De Naeghel et al., 2012; Gallik, 1999), leisure reading (Hughes-Hassell & Rodge, 2007; Stokmans, 1999), extracurricular reading (Chen, 2009; Pfost, Dörfler, & Artelt, 2013), and voluntary reading (Kim, 2007; Krashen, 2005). In the present study the term recreational reading is used to refer to non-obligatory reading activities that are undertaken voluntarily in order to gain personal satisfaction from reading itself. There is evidence of a positive relationship between academic and recreational reading. Studies have shown, for instance, that recreational reading can enhance learners' reading proficiency (e.g., Clark & Rumbold, 2006), breadth of vocabulary (e.g., Pfost et al., 2013), reading attitude and motivation (e.g., Guthrie & Wigfield, 1999), and reading achievement (Kim, 2007; Krashen, 2005).

Overall, different modes and purposes of reading provide unique contexts for students to recognize and develop their own reading interest. Yet little is known about whether and how reading interest is manifested across different reading settings (print and online) and purposes (academic and recreational). The present study examines a variety of psycho-behavioral constructs of reading interest in the context of reading modes and purposes of reading.

Psycho-Behavioral Constructs Related to Reading Interest

Reading interest is recognized as a multidimensional construct, incorporating one's affective, cognitive and behavioral tendencies towards an object, event or tasks related to reading (Hidi et al., 2004). While a great deal of research has been published about how interest in reading may develop (e.g., Hidi et al., 2004), most of these studies have been conducted within the traditional text-based environment. Much less is known about reading interest in the digital environment. Over the past two decades, research on reading interest has examined a range of constructs, including enjoyment (Chen et al., 1999; Hidi et al., 2004), sense of flow (Csikszentmihalyi, 1997) and other positive feelings such as excitement and passion (McKenna et al., 2012). While the affective component is an indispensable aspect of

interest (Hidi et al., 2004; Silvia, 2008), cognitive evaluation also plays a part in sustaining interest. The cognitive components that have been associated with reading interest are recognition of utility value (Schiefele, 1999; Wigfield & Cambria, 2010) and achievement of competence, autonomy and relatedness through reading activities (Ryan & Deci, 2000). Reading interest can also be strengthened and maintained by personal experience. Students who find that they can read with focus might realize that they like reading and seek more information about related topics (Hidi et al., 2004; Krapp, 1999). Positive experiences in reading also increase confidence in reading: the more one reads, the more confident about reading one feels (Manfredo, Driver, & Tarrant, 1996; Schiefele, 1999). When students believe that their good grades are due to their successful reading, such positive, subjective evaluations can lead to self-belief in competence (Manfredo et al., 1996; Schiefele, 1999). Through reading, readers can experience novelty, challenge, and a sense of exploration and excitement (Kashdan et al., 2009). Exploration in reading represents curiosity and interest in new knowledge and experiences and the desire to find out more about a topic for its own sake (Chen, Darst, & Pangrazi, 1999).

In summary, a review of reading interest literature identified a number of constructs that had been extensively researched. The approach in the present study was to examine as many of these constructs as possible. They were: (1) enjoyment (Hidi et al., 2004), (2) emotional reaction (Silvia, 2008), (3) experience of flow (Shernoff et al., 2003) (4) utility value (Schiefele, 1999; Wigfield & Cambria, 2010), (5) autonomy (Ryan & Deci, 2000), (6) competence belief (Ryan & Deci, 2000; Schiefele, 1999), (7) relatedness or a sense of belonging (Hidi et al., 2004), (8) attention (Hidi, 1995), (9) elaboration (Krapp, 1999), (10) information seeking (Hidi et al., 2004), (11) exploration (Kashdan et al., 2009), and (12) experiences of competence (Manfredo et al., 1996). Figure 1 illustrates how these 12 psycho-behavioral constructs were examined, along with reading modes and reading purposes. For ease of presentation, the links from enjoyment, a sense of belonging and elaboration are shown, but the initial conceptualization was that each of the reading-related psycho-behavioral constructs can be linked to any or all of the reading modes and reading purposes.

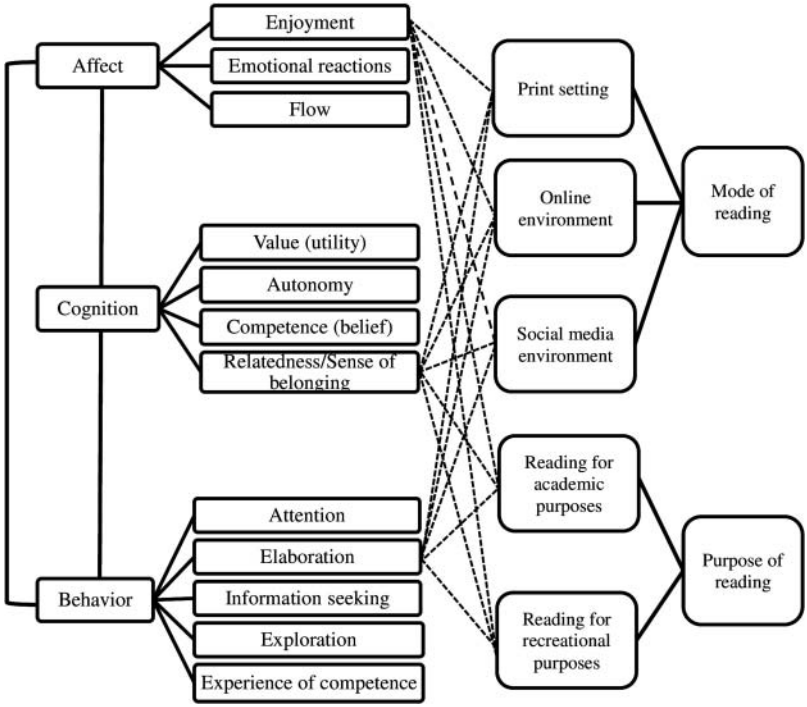

FIGURE 1 An initial conceptualization of reading interest situated in relation to reading modes and reading purpose.

Aims

The present study adopts the view that reading interest may have different meanings for different types of reading mode and reading purpose and seeks to identify which psycho-behavioral constructs are manifested in different modes and purposes of reading. For example, is enjoyment of reading associated with print-based reading settings? Is a sense of belonging manifested in an online reading enviroment? Does elaboration occur in conjuction with academic reading? Is information-seeking behavior related to recreational reading? A similar approach was adopted in a previous empirical study. McKenna et al. (2012) reported four dimensions of reading attitudes based on data from middle-school students in the U.S.: academic-print reading, academic-digital reading, recreational-print reading, and recreational-digital reading. Their conceptualization of reading attitudes, however, did not incorporate psycho-behavioral dimensions. The

current investigation examines psycho-behavioral aspects of reading and how they are manifested in different modes and purposes of reading.

Method

Participants

Participants were drawn from undergraduate students in an Indonesian university ($N = 993$). University students, rather than school-aged children, were chosen because individual differences in preferred reading types (modes and purposes) would be more pronounced among older students. We also argue that students in a developing country such as Indonesia, where the digital environment is not a dominant mode of reading, would be an ideal setting for the present study because both traditional and digital modes of reading are likely to be used.

An invitation to participate in the study was sent via email to the offices of all departments in the university. Banners and pamphlets were also distributed across the campus. Volunteer participants attended a computer center where they completed an online survey. The study sample comprised 71% female and 29% male participants.[2] The average age was 20.14 years, with the majority in their second (45%) or third (35%) year of university. They were from a diverse range of majors: Languages and Arts (46%), Social Sciences (14%), Education (18%), Natural Science and Math (9%), Engineering (6%), Economics (4%), and Sports Sciences (2%).[3]

Measures

An initial set of 347 items was constructed to assess the 12 psycho-behavioral constructs listed above. Each item taps a particular

[2]The sample had a substantially larger number of females than the Indonesian national average for the undergraduate student population (48% males and 52% females in 2015) (DIKTI, 2015).

[3]The disproportionately large representation of students in Languages and Arts, Social Sciences, and Education was not considered a limitation because the inquiry focused on reading in general rather than disciplinary specific topics.

psycho-behavioral construct (e.g., enjoyment), which is situated in one of the four reading settings (printed texts, digital, academic, and recreational). Example items are "Reading in print settings makes me feel good"; "Reading online is one of my favorite activities"; "Time goes quicker than usual when I read for my courses"; and "I spend most of my spare time to read for pleasure." The items that were retained after factor analysis are presented in Table 1. All items were measured on a 5-point scale, from "Strongly Disagree" (1) to "Strongly Agree" (5) with the mid-point of "Neither Disagree nor Agree" (3).

Statistical Analysis

The main statistical analyses were exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Typically, the criteria for retaining items from the EFA results are: (a) a factor having at least three items with significant loadings (.30 or greater); (b) the items that load on the same latent variable need to share a conceptual meaning; (c) the rotated factor pattern needs to demonstrate a simple structure; (d) based on Kaiser's criterion (1960), the factors with eigenvalues greater than one are considered for item retention; and (e) scree plots (Cattell, 1966) are examined to locate the break between large and small eigenvalues (see Field, 2009).

In this study, CFA was also used to confirm the measurement model suggested by the EFA and to further investigate a potential hierarchical structure of the reading interest dimensions. *Mplus* version 7.2 (Muthén & Muthén, 1998–2012) was used for both EFA and CFA and SPSS was used for EFA. Promax rotation was used for EFA. The maximum likelihood estimation with robust standard errors (MLR) was used to adjust for nonnormality of the survey data, as suggested in Bentler (2005). The Comparative Fit Index (CFI $>$ .90), Tucker-Lewis index (TLI $>$ .90), Root Mean Square Error of Approximation (RMSEA $<$ .05), and Standardized Root Mean Square Residual (SRMR $<$ .05) were used to indicate a good model fit (criteria cut-off scores indicated in brackets; see also Byrne, 2006). A ratio of 1/3 or less between the degrees of freedom (*df*) and chi-square statistics (x^2) was used as an acceptable model fit criterion (see Wang & Wang, 2012).

TABLE 1 Summary of the Exploratory and Confirmatory Factor Analysis Results: Factors, Items, Standardized Factor Loadings, and Reliability of Each Scale

	EFA/ CFA standardized factor loadings														
Items	ELA_P	ENJ_P	COM_P	VAL_O	CONF_O	ENJ_O	COM_O	FLW_O	BEL_S	ENJ_S	ENJ_A	COM_A	FLW_A	ELA_R	ENJ_R
1. I connect what I read in print materials to my prior knowledge.	.52/.82														
2. When I read in print settings, I try to understand the material better by relating to my own experiences.	.73/.80														
3. When I read in print settings, I figure out how the text information fits in with what happens in real life.	.66/.77														
4. I enjoy reading in print settings.		.79/.83													
5. Reading in print settings makes me feel good.		.70/.78													
6. I feel happy if I receive a book as a present.		.61/.68													
7. I had good grades because I liked reading in print settings.			.86/.88												
8. My reading ability in print settings continues to help me get good grades.			.85/.85												
9. I did well in school due to my ability in reading in print settings.			.75/.83												
10. I did well in my courses because I read fast.			.64/.69												
11. Reading online often helps me think about new ideas.				.45/.72											
12. Reading online improves my general knowledge.				.60/.69											
13. New ideas come to my mind when I read online.				.57/.69											
14. I learn about what is going on in the world by online reading.				.60/.64											
15. Reading online makes me feel connected to the world.				.41/.64											

(*Continued on next page*)

TABLE 1 Summary of the Exploratory and Confirmatory Factor Analysis Results: Factors, Items, Standardized Factor Loadings, and Reliability of Each Scale *(Continued)*

	EFA/ CFA standardized factor loadings														
Items	ELA_P	ENJ_P	COM_P	VAL_O	CONF_O	ENJ_O	COM_O	FLW_O	BEL_S	ENJ_S	ENJ_A	COM_A	FLW_A	ELA_R	ENJ_R
16. I gain a great deal of information whenever I read online.				.60/.61											
17. Reading online is easy for me.					.78/.88										
18. I do not have problems in online reading.					.57/.76										
19. When I read from a computer device (e.g., computer screen, cell-phone, etc.), I am a good reader.					..85/.69										
20. Reading online is one of my favorite activities.						.77/.84									
21. Reading online makes me feel good.						.64/.81									
22. I always try to find time to read online for enjoyment.						.59/.69									
23. I did well in my courses because of online reading.							.69/.91								
24. I did well in school due to my online reading ability.							.91/.91								
25. I had good grades because I liked online reading.							.82/.85								
26. My academic achievement has been influenced by my online reading ability.							.78/.83								
27. I feel absorbed when I read online.								.87/.94							
28. When I read online, I forget about other things.								.88/.82							
29. Time goes quicker than usual when I read online.								.50/.67							
30. I feel connected to others who may have read the same things from social media sites (e.g. Facebook, WhatsApp).									.84/.86						

31. Social media reading (e.g. Facebook, WhatsApp) makes me feel connected to the world.	.73/.81				
32. Social media reading (e.g. Facebook, WhatsApp) makes me feel belonged to a certain group.	.78/.76				
33. Social media reading (e.g. Facebook, WhatsApp) makes me communicate better with others.	.67/.75				
34. Reading from social media sites is one of my favorite activities (e.g. Facebook, WhatsApp).		.77/.83			
35. Most of the knowledge I obtained is through social media reading.		.65/.68			
36. Once I read social media sites (e.g. Facebook, WhatsApp), I keep reading for hours.		.62/.65			
37. I find reading for my courses exciting.			.89/.92		
38. Reading for my courses makes me feel good.			.83/.88		
39. I enjoy reading for my courses.				.73/.79	
40. I did well in my courses because of my reading.				.86/.92	
41. I had good grades because I liked reading for my courses.				.82/.87	
42. My academic achievement has been influenced by my own reading for the courses.				.76/.82	
43. Time goes quicker than usual when I read for my courses.					.83/.83
44. When I read for my courses, I forget about other things.					.71/.74

(*Continued on next page*)

TABLE 1 Summary of the Exploratory and Confirmatory Factor Analysis Results: Factors, Items, Standardized Factor Loadings, and Reliability of Each Scale *(Continued)*

	EFA/ CFA standardized factor loadings														
Items	ELA_P	ENJ_P	COM_P	VAL_O	CONF_O	ENJ_O	COM_O	FLW_O	BEL_S	ENJ_S	ENJ_A	COM_A	FLW_A	ELA_R	ENJ_R
45. Once I read for my courses, I keep reading for hours.													.65/.72		
46. When I read for pleasure, I often try to connect what I read to what I already know.														.85/.85	
47. When I read for pleasure, I relate what I read to my personal experiences.														.66/.79	
48. When I read for pleasure, I want to know more about the topic I am reading.														.46/.71	
49. I like reading for my own self-satisfaction.															.91/.94
50. I enjoy reading for pleasure.															.89/.91
51. I spend most of my spare time to read for pleasure.															.48/.65
Reliability	.84	.80	.89	.82	.82	.82	.95	.84	.87	.76	.89	.90	.80	.82	.86
(Number of items)	(3 items)	(3 items)	(4 items)	(6 items)	(3 items)	(3 items)	(4 items)	(3 items)	(4 items)	(3 items)	(3 items)	(3 items)	(3 items)	(3 items)	(3 items)

Notes. The 51 items were the outcome of factor analyses conducted on the original set of 347 items. Initially, these were enjoyment (62 items), emotional reaction (31 items), and sense of belonging (18 items), utility value (45 items), confidence (25 items), autonomy (39 items), and competence (18 items), attention (20 items), experiences of reading flow (24 items), information seeking (27 items), and using elaboration (31 items) and exploration (25 items) strategies while reading. ELA_P: *Elaboration of Reading in Print Settings* (Factor 1); ENJ_P: *Enjoyment of Reading in Print Settings* (Factor 2); COM_P: *Competence Experience in Reading in Print Settings* (Factor 3); VAL_O: *Utility Value in Online Reading* (Factor 4); CONF_O: *Confidence in Online Reading* (Factor 5); ENJ_O: *Enjoyment of Online Reading* (Factor 6); COM_O: *Competence Experience in Online Reading* (Factor 7); FLW_O: *Flow Experience in Online Reading* (Factor 8); BEL_S: *Sense of Belonging in Social Media Reading* (Factor 9); ENJ_S: *Enjoyment in Social Media Reading* (Factor 10); ENJ_A: *Enjoyment of Academic Reading* (Factor 11); COM_A: *Competence Experience in Academic Reading* (Factor 12); FLW_A: *Flow Experience in Academic Reading* (Factor 13); ELA _R: *Elaboration of Recreational Reading* (Factor 14); and ENJ_R: *Enjoyment of Recreational Reading* (Factor 15).

Results

Exploratory and Confirmatory Factor Analysis

Numerous runs of exploratory factor analysis (EFA) of 347 items led to the final set of 51 items. All the retained items had standardized factor loadings greater than .50, representing strong item-factor correspondence. In the final decision, particular consideration was given to size of eigenvalues, percentage of the total variance in the items extracted by the factors and, importantly, factor interpretability. Based on the criterion of an eigenvalue greater than 1, the 12-factor solution seemed most appropriate (i.e., the 12^{th} eigenvalue was 1.014). On the other hand, the *Mplus* EFA results showed that models with 10 factors or more (11 factors, 12 factors, etc.) would produce virtually the same data fit. Careful examination of item-factor interpretability, however, suggested that the most reasonable and clear-cut factor solution was obtained by a 15-factor model. The 15-factor structure contained no double-loadings, extracted a substantial amount (75%) of the total variance in the items, and yielded an excellent model fit to the data with $x^2 = 819.77$, $df = 615$, $x^2/df = 1.3$, RMSEA = 0.02, SRMR = 0.01, CFI = 0.99, and TLI = 0.98. When the same item-factor correspondence was tested by the more stringent, confirmatory factor analysis (CFA), the 15-solution model showed an excellent fit to the data, with fit indices of $x^2 = 1914.06$, $df = 1119$, $x^2/df = 1.7$, RMSEA = 0.03, SRMR = 0.04, CFI = 0.97, and TLI = 0.96. Table 1 presents the results of the final EFA and CFA for the retained 51 items and their corresponding factors, standardized factor loadings, and Cronbach's α of each factor as a reliability measure. Reliability of each of these factors was reasonably high with Cronbach's α values ranging from .76 (Factor 10, ENJ_S) to .95 (Factor 7, COM_O). Given that most of these sub-scales have relatively small numbers of items (3 or 4 items), their internal consistency is reasonably high.

The 15 latent factors were identified as: *Elaboration of Reading in Print Settings* (Factor 1, ELA_P); *Enjoyment of Reading in Print Settings* (Factor 2, ENJ_P); *Competence Experience in Reading in Print Settings* (Factor 3, COM_P); *Utility Value in Online Reading* (Factor 4, VAL_O); *Confidence in Online Reading* (Factor 5, CONF_O); *Enjoyment of Online Reading* (Factor 6, ENJ_O); *Competence Experience in*

Online Reading (Factor 7, COM_O); *Flow Experience in Online Reading* (Factor 8, FLW_O); *Sense of Belonging in Social Media Reading* (Factor 9, BEL_S); *Enjoyment in Social Media Reading* (Factor 10, ENJ_S); *Enjoyment of Academic Reading* (Factor 11, ENJ_A); *Competence Experience in Academic Reading* (Factor 12, COM_A); *Flow Experience in Academic Reading* (Factor 13, FLW_A); *Elaboration of Recreational Reading* (Factor 14, ELA _R); and *Enjoyment of Recreational Reading* (Factor 15, ENJ_R). For instance, Factor 1, *Elaboration of Reading in Print Settings* (ELA_P) consisted of three items: "I connect what I read in print materials to my prior knowledge"; "When I read in print settings, I try to understand the material better by relating to my own experiences"; and "When I read in print settings, I figure out how the text information fits in with what happens in real life." This factor is clearly defined as readers' tendency to elaborate what they read in print settings to real life or to their own knowledge and experiences. In another example, Factor 5, *Confidence in Online Reading* (CONF_O), was defined by three items: "Reading online is easy for me"; "I do not have problems in online reading"; "When I read from a computer device (e.g., computer screen, cell-phone, etc.), I am a good reader." These items show readers' confidence in reading in an online platform.

A few noteworthy findings relating to the retained 15 factors can be summarized as follows. First, it appears that the primary source of the 15 latent factors is psycho-behavioral aspects of reading interest rather than reading modes or reading purposes. That is, the 15 latent factors showed that eight psycho-behavioral constructs are represented as separate dimensions of reading interest: elaboration (Factor 1, ELA_P and Factor 14, ELA _R), enjoyment (Factor 2, ENJ_P; Factor 6, ENJ_O; Factor 10, ENJ_S; Factor 11, ENJ_A; and Factor 15, ENJ_R), competence experience (Factor 3, COM_P; Factor 7, COM_O; and Factor 12, COM_A), utility value (Factor 4, VAL_O), confidence (Factor 5, CONF_O), flow experience (Factor 8, FLW_O and Factor 13, FLW_A), and a sense of belonging (Factor 9, BEL_S), each of which is situated in different modes and different purposes of reading. On the other hand, several other constructs assessed by the initial battery of the reading interest measure did not emerge as strong separate factors, including a variety of emotional reactions towards reading (e.g., fascinated, bored, annoyed), autonomy (e.g., "I choose books to read"), focus and attention (e.g., "I get easily distracted when I

read"), information seeking (e.g., "I acquire a great deal of information whenever I read"), and exploration (e.g., "Reading makes me know more about the world").

Second, out of the 15 retained factors, *Enjoyment of Reading* seems to be the most prominent psycho-behavioral dimension of reading interest as it is manifested across all five types of reading settings, i.e., print-based (Factor 2, ENJ_P), online (Factor 6, ENJ_O), and social media (Factor 10, ENJ_S) and for academic (Factor 11, ENJ_A) and recreational purposes (Factor 15, ENJ_R). It is also interesting that enjoyment of reading is viewed separately across these five settings. For example, both Factor 2 (*Enjoyment of Reading in Print Settings*) and Factor 10 (*Enjoyment in Social Media Reading*) tap enjoyment but turn out to be separate factors situated in different modes of reading.

Third, with the exception of enjoyment, the rest of the psycho-behavioral constructs of reading interest were manifested only in particular reading settings. That is, *Sense of Belonging* was shown only in relation to the social media environment (Factor 9). Similarly, *Utility Value* (Factor 4) and *Confidence* (Factor 5) were shown only in relation to online reading. *Flow Experience* was manifested in two settings: reading online (Factor 8) and for academic reading (Factor 13). Similarly, *Elaboration* emerged in two settings: reading in print settings (Factor 1) and for recreational reading (Factor 14). Meanwhile, *Competence Experience* was identified across three settings of reading: print settings (Factor 3), reading online (Factor 7) and reading for academic purposes (Factor 12), suggesting that students experienced a feeling of competence while reading printed materials, reading online and reading for academic purposes, but perhaps less so when reading for recreational purposes and reading in social media settings.

Fourth, although it appears that the factors are separated by psycho-behavioral dimensions, it is also evident that mode and purpose of reading contribute to defining each of the 15 latent factors. That is, a mode or purpose of reading was an underlying theme in defining each of the fifteen factors as, for example, in Elaboration of Reading in *Print Settings* (Factor 1, ELA_P); Utility Value in *Online Reading* (Factor 4, VAL_O); Sense of Belonging in *Social Media Reading* (Factor 9, BEL_S); Flow Experience in *Academic Reading* (Factor 13, FLW_A); and Enjoyment of *Recreational Reading* (Factor 15, ENJ_R). Another way of describing the

presence of the mode and purpose of reading in each of the factors is that, for example, the factors that are labeled as *Enjoyment of Reading* (Factors, 2, 6, 10, 11, and 15) did not converge into one single factor. Rather, they were manifested five times, distinguished by five different reading settings by modes and purposes. Similarly, *Flow Experience* in reading was manifested in two reading settings: reading online (Factor 8) and academic reading (Factor 13), while *Elaboration* emerged in two settings and *Competence Experience* manifested in three settings of reading. Thus, the psycho-behavioral aspects as well as the mode and purpose of reading were all present, contributing to the formation of each of the dimensions that were defined as the sub-components of reading interest.

Correlations Among the 15 Factors

Correlations among the 15 factors are presented in Table 2. First, we examined the correlations between the factors representing the same psycho-behavioral constructs. They are: between Factors 1 and 14 (*Elaboration*), among Factors 2, 6, 10, 11, and 15 (*Enjoyment*), among Factors 3, 7, and 12 (*Competence Experience*), and between factors 8 and 13 (*Flow Experience*). There are 15 correlations, which are indicated in circles in Table 2. The majority of these correlations (10 out of 15) were weak or moderately weak, as expected, suggesting that the reading interest dimensions tapping the same psycho-behavioral constructs were at most only moderately correlated with each other. This finding supports the evidence that the same psycho-behavioral constructs did not form one single factor. Five pairs, however, showed moderately strong or strong correlations, with the two largest correlations being $r = .81$ between *Elaboration* in print settings (Factor 1) and *Elaboration* in recreational reading (Factor 14), and $r = .67$ between *Competence Experience* in print settings (Factor 3) and *Competence Experience* for academic reading (Factor 12). These strong correlations suggest not only that the construct is shared between the two factors, but also that there is a shared variance between the reading mode and reading purpose in relation to the particular construct. For example, the high correlation between Factors 1 and 14 suggests that people who tend to use

TABLE 2 Factor Correlations Among the 15 Factors of Reading Interest

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. ELA_P	1														
2. ENJ_P	.53**	1													
3. COM_P	.41**	.45**	1												
4. VAL_O	.67**	.40**	.36**	1											
5. CONF_O	.31**	.23**	.25**	.60**	1										
6. ENJ_O	.30**	.10*	.13**	.58**	.64**	1									
7. COM_O	.30**	.21**	.50**	.45**	.41**	.36**	1								
8. FLW_O	.20**	.09*	.07**	.36**	.40**	.54**	.29**	1							
9. BEL_S	.39**	.16**	.15**	.48**	.32**	.27**	.29**	.24**	1						
10. ENJ_S	.14**	−.06	.11*	.30**	.29**	.31**	.32**	.27**	.62**	1					
11. ENJ_A	.40**	.43**	.53**	.41**	.23**	.13**	.35**	.01	.22**	.11*	1				
12. COM_A	.47**	.45**	.67**	.40**	.24**	.13**	.36**	.07	.22**	.13**	.54**	1			
13. FLW_A	.30**	.26**	.42**	.20**	.10*	.06	.34**	.13**	.11*	.08	.56**	.42**	1		
14. ELA_R	.81**	.49**	.32**	.67**	.36**	.39**	.24**	.30**	.44**	.20**	.30**	.41**	.21**	1	
15. ENJ_R	.53**	.52**	.22**	.42**	.25**	.33**	.16**	.27**	.25**	.11**	.13**	.32**	.04	.59**	1

Notes: $^{**}p < .01$; $^{*}p < .05$. Circles indicate correlations between the same psychological constructs. The correlations within the thicker solid line were between the factors that share the particular reading modes or reading purposes. ELA_P: *Elaboration of Reading in Print Settings* (Factor 1); ENJ_P: *Enjoyment of Reading in Print Settings* (Factor 2); COM_P: *Competence Experience in Reading in Print Settings* (Factor 3); VAL_O: *Utility Value in Online Reading* (Factor 4); CONF_O: *Confidence in Online Reading* (Factor 5); ENJ_O: *Enjoyment of Online Reading* (Factor 6); COM_O: *Competence Experience in Online Reading* (Factor 7); FLW_O: *Flow Experience in Online Reading* (Factor 8); BEL_S: *Sense of Belonging in Social Media Reading* (Factor 9); ENJ_S: *Enjoyment in Social Media Reading* (Factor 10); ENJ_A: *Enjoyment of Academic Reading* (Factor 11); COM_A: *Competence Experience in Academic Reading* (Factor 12); FLW_A: *Flow Experience in Academic Reading* (Factor 13); ELA _R: *Elaboration of Recreational Reading* (Factor 14); and ENJ_R: *Enjoyment of Recreational Reading* (Factor 15).

elaboration strategies while reading in print settings would also tend to do so when they read for recreational purposes. Thus, the high correlation also signals the close relationship between reading in print settings and recreational reading when it comes to people's tendency to elaborate when they read.

The second set of correlations that have produced substantial correlations are those among the factors which represent different psycho-behavioral constructs but are situated in the same reading setting—print setting, online reading, social media, academic reading, and recreational reading (contained in rectangular boxes in Table 2). As can be seen, these correlations were not weak, the majority being in the range of $r = .40$s to .60s. For instance, *Elaboration* in print settings was moderately strongly correlated ($r = .41$, .45, and .53, $ps < .01$) with the other two factors situated in print settings, *Enjoyment* in print settings and *Competence Experience* in print settings. *Utility Value* in reading online (Factor 4) was correlated with *Confidence* in reading online (Factor 5, $r = .60$, $p < .01$), with *Enjoyment* of reading online (Factor 6, $r = .58$, $p < .01$), with *Competence Experience* in reading online (Factor 7, $r = .45$, $p < .01$), and with *Flow Experience* in reading online (Factor 8, $r = .36$, $p < .01$). Two factors in relation to social media reading were also moderately strongly correlated with each other ($r = .62$ between Factors 9 and 10), as were all three factors relating to academic reading ($rs = .42$, .54, and .56 among Factors 11, 12, and 13) and the two factors relating to recreational reading ($r = .59$ between Factors 14 and 15). Taken together, the moderately strong correlational patterns suggest the possibility of a higher-order factor structure representing a mode or purpose of reading.

Higher-order Confirmatory Factor Analysis

A higher-order measurement model was constructed with the 15 latent variables as the primary factors at the first-order level and 5 factors at the second-order level. The 5 second-order factors represent (a) reading in print settings, (b) online text reading, (c) reading of social media sites, (d) academic reading and (e) recreational reading. The data fit of the second-order model was good, showing $x^2 = 2771.46$, $df = 1119$, $x^2/df = 2.3$, CFI = 0.93, TLI = 0.93, RMSEA = 0.04, and SRMR = 0.07. The correlations among

TABLE 3 Factor Correlations Among the 5 Second-Order Factors of Reading Interest

	1	2	3	4	5
1. Print-based reading	1				
2. Online reading	0.73	1			
3. Social media reading	0.48	0.62	1		
4. Academic reading	0.86	0.56	0.35	1	
5. Recreational reading	0.90	0.80	0.54	0.63	1

Note. All the correlations are statistically significant at a p-value $< .01$.

the five second-order factors are presented in Table 3. As can be seen, the majority of the correlations are at least moderately strong. The smallest correlation was $r = .35$ between social media reading and academic reading and the next smallest correlation was $r = .48$ between social media reading and print-based reading. The largest correlation was $r = .90$ between print-based reading and recreational reading, followed by $r = .86$ between print-based reading and academic reading and $r = .80$ between online reading and recreational reading. Thus, it appears that print-based reading was highly correlated with both academic ($r = .86$) and recreational reading ($r = .90$). On the other hand, online reading was highly correlated with recreational reading ($r = .80$) but not so much with academic reading ($r = .56$). A substantial size of correlation was shown between print-based and online reading ($r = .73$), between academic and recreational reading ($r = .63$), and between online and social media reading ($r = .62$). It is noteworthy that recreational reading was highly correlated with print-based reading ($r = .90$) but as much with social media reading ($r = .54$).

Given the substantial sizes of correlations among the second-order factors, another higher-order measurement model was constructed to test the possibility of extracting a third-order factor that consisted of all five second-order factors. The third-order level factor is labeled as a general factor of reading interest. The third-order model is presented in Figure 2. This third-order factor model produced a good fit index: $x^2 = 2920.88$, $df = 1204$, $x^2/df = 2.4$, CFI = 0.93, TLI = 0.92, RMSEA = 0.04, and SRMR = 0.08. Overall, the pattern of second-order correlations is

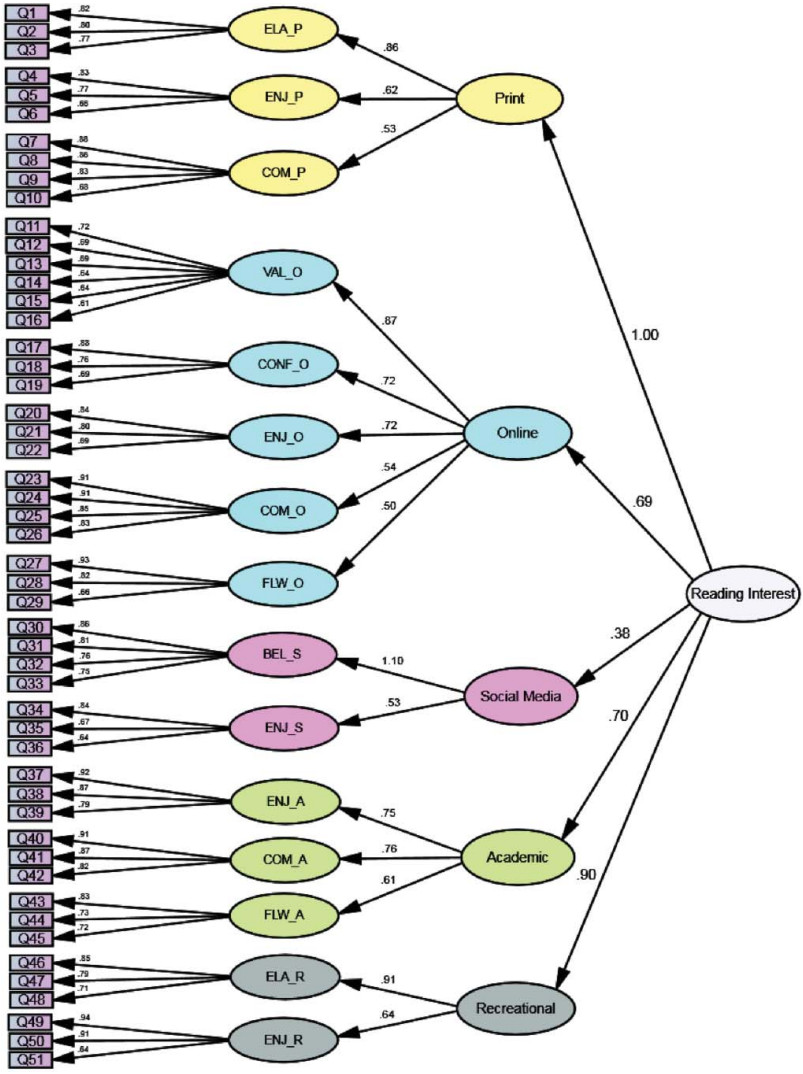

FIGURE 2 A third-order factorial structure of reading interest.

reflected in this third-order factor structure. The strongest contributors to the general factor of reading interest are print-based reading ($\beta = 1.0$) and recreational reading ($\beta = .90$). This suggests that people's reading interest is most saliently presented by their reading habit when they do not have to read (i.e.,

recreational reading) and whether they are motivated to print the text materials or buy hard copy books (i.e., print-based reading). Academic reading ($\beta = .70$) and online reading ($\beta = .69$) also showed substantial second-order factor loadings but not as strong as print-based and recreational reading. On the other hand, social media reading contributes the least to the make-up of the general factor of reading interest ($\beta = .38$), suggesting that it is somewhat different from the other four second-order factors.

Summary of Factor Analysis

The first model constructed and tested in this study was a CFA-based model with just 15 primary factors. The second model was a second-order CFA with 15 primary factors at the first-order level and 5 factors at the second-order level. The third model was a third-order CFA with 15 primary factors at the first-order level, 5 factors at the second-order level, and one factor combining all five second-order factors at the third-order level. All three models showed a good fit to the data. Factors representing the psycho-behavioral dimensions of reading interest were the primary building blocks of reading interest, as shown in the first model, and the particular mode or purpose of reading, i.e., the shared characteristics of the first-order factors, also contributed to the make-up of the second-order as well as the first-order factors. In the third-order model, a general factor of reading interest captured the shared variances of the second-order and primary-order factors. Out of the three models, the third-order factor model is deemed the most comprehensive and yet parsimonious representation of reading interest because (a) all 15 primary factors are summarized and captured by the general factor of reading interest, (b) the model also shows the presence of the five second-order factors representing the commonalities of the primary factors situated in the same modes or purposes of reading, and (c) it ultimately describes how the different aspects of reading interest across psycho-behavioral dimensions, reading modes and reading purposes are connected to

each other, contributing to the formation of one general factor of reading interest.

Discussion

The present study investigated the psycho-behavioral dimensions of reading interest and examined how they may differ in the contexts of different modes and purposes of reading. The medium of reading has changed dramatically over the past decade as various computer devices have come to be used for reading. Yet little is known about how or, indeed, whether this change might have influenced our reading interest. One of the most noteworthy findings of this study was that reading interest was primarily distinguished at the first-order level by psycho-behavioral dimensions rather than reading modes or reading purposes. The main building blocks of the reading interest dimensions were created by the 15 clearly distinctive psycho-behavioral constructs. There is strong research support from previous studies that the following are important constructs in relation to reading interest: enjoyment (e.g., Hidi et al., 2004), flow (Csikszentmihalyi, 1997), confidence (e.g., Stankov & Lee, 2015), competence experience (Schiefele, 1999), utility value (Schiefele, 1999; Wigfield & Cambria, 2010), and elaboration (Krapp, 1999; Schiefele, 1999).

The present study found that reading modes and reading purposes also contributed to the formation of the primary factors. If, let us say, the five enjoyment-related factors across different reading modes and reading purposes (Factor 2, ENJ_P; Factor 6, ENJ_O; Factor 10, ENJ_S; Factor 11, ENJ_A; and Factor 15, ENJ_R) turned out to be one single factor, the factor would have been labeled as enjoyment of reading without a particular mode or purpose of reading attached to the contexts of the enjoyment of reading factors. However, each of these factors shows the presence of a particular reading mode or reading purpose (e.g., *Enjoyment of Reading in Print Settings, Enjoyment of Online Reading*). Furthermore, separate second-order factors representing each of the reading modes or purposes suggest that different psycho-behavioral dimensions of reading interest can be closely related to each other when they are situated in the same reading settings (e.g., online, recreational reading).

The presence of a third-order factor consisting of all first-order and second-order dimensions was a rather unexpected result because the reading-related constructs employed in this study had not been put together in previous studies; hence, the extant literature could not have suggested a general tendency of reading interest that encompassed all the psycho-behavioral aspects, modes and purposes of reading. On the other hand, a general factor is often found in traditional constructs, such as intelligence (Jensen, 1969; Spearman, 1927) or domain-specific academic achievement (OECD, 2004). In this light, the general factor of reading interest is not an entirely unexpected result.

The third-order structure was informative in demonstrating that (a) print-based reading and recreational reading are the most salient aspects of reading interest, and (b) reading of social media is somewhat different from the general factor of reading interest defined by the other four settings of reading (print-based, online, academic, and recreational reading). Previous research has suggested that reading in the social media environment represents a distinct form of reading and does not necessarily share the features of simply reading the texts in the online environment. Social media reading requires individuals to "(1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (Boyd & Ellison, 2008, p. 211). The core motivation of social media reading is known to be maintenance and improvement of social interactions (Boyd & Ellison, 2008). Thus, it involves readers' active engagement with a loosely defined or unknown audience, which may be psychologically different from just pure interest in reading itself.

The mode-related, second-order factors (print-based, online, and social media reading) showed that the psychological bases of these three types of reading interest are not drastically different from one another. It appears that new types of reading (i.e., reading using an electronic device) have not replaced reading in the more traditional, print-based settings. Rather, print-based reading is still the strongest second-order factor defining the general factor of reading interest.

The primary factors of the present study also showed that the psycho-behavioral dimensions that emerged have some unique pairings with respect to particular modes or purposes of reading. For instance, elaboration was manifested in conjunction with reading in print settings (Factor 1, *Elaboration of Reading in Print Settings*) and reading for recreational purposes (Factor 14, *Elaboration of Recreational Reading*). This means that people would elaborate what they read (e.g., pause and think about what they read, make connection to what they already know) when they read in print settings and when they read for recreational purposes, but perhaps not so much when they read online (where web-links to other, related reading materials are already provided in the reading setting), when they read social media websites (where reading takes, more or less, the form of a conversation), or when they read for academic purposes (where readers may have limited time to complete the reading assignment).

Similarly, students' experience of feeling competent in reading was associated with the three types of reading settings: print-based (Factor 3, *Competence Experience in Reading in Print Settings*, COM_P); online (Factor 7, *Competence Experience in Online Reading*, COM_O); and academic reading (Factor 12, *Competence Experience in Academic Reading*, COM_A). Students who have struggled with reading would have developed a dislike for reading activities (Wilson & Casey, 2007). This sense of success or failure in reading turned out to be important when students read print texts or online materials and when they read for academic purposes, but not as much when they read in social media contexts or for recreational purposes (where competence is typically not challenged via formal assessment). Utility value and confidence in reading were manifested in the online reading environment only. A sense of belonging emerged only in the context of reading of social media websites.

Previous research has suggested that the online reading environment requires readers to have positive attitudes, patience, persistence, creativity, critical thinking skills, and confidence in order to navigate through and interpret the information available online (Coiro, 2012). In addition, online readers engaging in social media are expected to be "personally productive, socially responsible, and able to collaborate with other members of a networked global community" (Coiro, 2012, p. 646). The present

study was able to narrow down the list of potential personal characteristics, proposing that perhaps the most salient aspects of reading in the online environment were whether readers find a particular online information source useful (utility value) and whether readers perceive themselves as having sufficient internet skills to attain what they need in the online environment (confidence).

While all the other psycho-behavioral dimensions showed unique pairings with particular reading modes and purposes, the factors of enjoyment of reading were manifested in all five types of reading settings (Factor 2, ENJ_P; Factor 6, ENJ_O; Factor 10, ENJ_S; Factor 11, ENJ_A; and Factor 15, ENJ_R). This finding supports a substantial body of research literature suggesting that enjoyment is the most crucial aspect of reading interest (Ainley & Ainley, 2011; OECD, 2004). Enjoyment of reading was one of the strongest predictors of reading achievement across 65 countries in PISA 2009 (Lee, 2014). The Organization for Economic Co-operation and Development (OECD, 2002) also reported that reading enjoyment is more important for students' academic success than their family's socio-economic background (OECD, 2002). In most if not all previous studies, reading enjoyment was examined in the contexts of print texts (e.g., Coiro, 2012). The present study extends these findings by demonstrating the importance of enjoyment of reading in the development of reading interest across print-based, online and social media reading, as well as reading for academic or recreational purposes.

Limitations of the Study

Some limitations of the present study should be noted. The data were drawn from undergraduate students in Indonesia. The findings reported in this paper therefore may only be generalized to young people living in a country whose economic and technological development is similar to that of Indonesia. Also, the primary method of data collection was self-report measures. Self-report measures are still the most widely used method in psychology studies; nonetheless, somewhat different results might be expected when different data collection methods (e.g., observation, time records of internet reading) are employed. Future

studies could also investigate a wider range of electronic devices and online applications for reading activities. It is expected that the meaning of reading would continually change among the people born into the digital age.

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