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Does perspective taking matter for writing? Perspective taking in source-based analytical writing of secondary students

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Abstract
Perspective taking, one's knowledge of their own mental and emotional states and inferences about others' mental and emotional states, is an important skill for writing development. In the present study, we examined how perspective taking is expressed in writing and how it is related to overall writing quality. We analyzed seventh graders' source-based analytical essays ($N = 195$) to investigate (1) the extent to which students incorporated perspective taking in their essays, (2) how the extent of perspective taking in essays differ by students' sex and English learner status, and (3) the extent to which perspective taking in writing is associated with overall writing quality. Findings revealed that students wrote more from their own perspective than that of others. Moreover, the results of multi-level analyses suggested that female students exhibited more varied perspectives but there was no meaningful difference by English learner status. Lastly, greater extent of perspective taking, particularly that of higher level of perspectives (i.e., dual perspective), was associated with better writing quality, after accounting for students' demographic backgrounds (e.g., sex, poverty status, English learner status) and essay length. These results underscore the importance of writing from multiple perspectives on writing quality.

Keywords Perspective taking · Adolescent writing · Higher order thinking skill · Writing quality

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Introduction

Writing is a communicative act that involves interface between cognition and writing process as the writer engages in meaning making. Writing and thinking go hand in hand, as reasoning plays a role in writing and vice versa (Applebee, 1984). According to the direct and indirect effects model of writing (DIEW; Kim, 2020a; Kim & Park, 2019), perspective taking, one's knowledge of their own mental and emotional states and inference about others' mental and emotional states, is one of the higher order cognitive skills that is involved in writing process and therefore, contributes to writing. In fact, perspective taking is posited to be particularly important after the beginning phase of writing development (Kim, 2020a) such that it becomes crucial for adolescent writers who have developed fluent transcription skills to allow for their mental resources to be dedicated to complex reasoning processes (Bereiter & Scardamalia, 1987; Kellogg, 2008).

In the present study, our goal was to investigate the extent to which perspective taking matters for adolescent writing. Specifically, we examined (1) the extent to which seventh grade students incorporate different perspectives into their source-based analytical writing, (2) how the extent of perspective taking differs by their backgrounds such as sex and English learner status, and (3) how the extent to which perspective taking is incorporated in writing is related to overall writing quality. We investigated these questions using data from students in Grade 7 who wrote in response to a prompt that required them to identify the theme of source texts, a widely employed type of writing task in secondary schools in the US. Our study contributes to the literature by deepening our understanding of perspective taking in writing, particularly in early adolescent writing.

Perspective taking in writing

Writing is an interactive social act and a form of communication using the medium of written text that involves negotiation between readers and writers (e.g., Nystrand, 1989; Rubin, 1984). According to DIEW (Kim, 2020a; Kim & Park, 2019), perspective taking is one of the skills that contribute to the mean-making or negotiation process in multiple ways, including understanding the goal of the writing task, considering the needs of audience, and developing deep understanding of source-texts. Via these multiple mechanisms, perspective taking is hypothesized to be important to establishing depth and coherence in writing. First, the writer needs to develop an accurate understanding of the intentions and expectations of a given writing task for effective communication. Second, effective writing requires writers to understand the perspective of their presumed audience to understand the needs of audience, and to formulate and adjust language, content, form, and structure accordingly (Kim & Schatschneider, 2017; Rubin, 1984). In fact, audience awareness in writing is considered an important feature that distinguishes novice writers from experts and is said to play a role throughout one's writing process (Bereiter & Scardamalia, 1987; Nussbaum & Kardash, 2005; Magnifico, 2010). Specifically, writers put themselves in the audience's shoes to gauge how familiar the readers may be with a

given topic (Carvalho, 2002) and to consider audience's needs in crafting presentation of the writer's ideas (Midgette, Haria & MacArthur, 2008). Therefore, perspective taking is an essential skill in being mindful of the target audience when writing. Third, perspective taking is important for source-based writing (Kim & Park, 2019). When writers draw upon their understanding of the source material, they think not only from their own perspective but also from the perspectives of the source text's authors and characters (Kim & Park, 2019; Graham & Harris, 2017). Perspective taking is also necessary when writers think about the source-text author's motivations for writing and evaluate the credibility of their position (Kuhn & Moore, 2015). In fact, perspective taking is considered as a shared skill for both reading and writing because writers take multiple perspectives when they read and reason whether the source material is appropriate in advancing their ideas in writing (Kim, 2020b; Fitzgerald & Shanahan, 2000). Thus, quality source-based writing depends on the writer's precise and deep understanding of the source text via perspective taking.

Importance of perspective taking in adolescent writing

The skills to express complex thinking in writing can develop across one's lifespan (Bazerman et al., 2017). However, it becomes more crucial in the developmental stage of early adolescence, as transcription skills (e.g., spelling, handwriting) become increasingly automatized, allowing for one's mental resources (e.g., working memory and attention) to be readily available for higher order thinking (Kim & Park, 2019; McCutchen, 2006). Adolescent writers are transitioning from the "knowledge telling" stage towards the "knowledge transforming" stage (Bereiter & Scardamalia, 1987), where they increasingly start to consider elements of purpose, discourse type, and audience when writing (Magnifico, 2010). Thus, for the majority of adolescents who developed fluent transcription skills, their cognitive resources become more accessible for complex reasoning processes such as perspective taking.

The demands for adolescent writers to exhibit perspective taking skills are delineated in the Common Core State Standards (CCSS; National Governors Association for Best Practices [NGA] & Council of Chief State School Officers [CCSSO]) that is widely adopted in the US. For narrative writing, the CCSS states that students should develop real or imagined events by establishing a context and point of view of the narrator and characters (NGA & CCSSO, 2010). This requires the writer to think from multiple perspectives, whether it be from the narrator or the characters. For the genre of argumentative writing, students should be able to "introduce claims, acknowledge alternate or opposing claims, and support claims with logical reasoning and relevant evidence from accurate, credible sources," while for expository writing, students should "develop a topic with relevant facts by using strategies such as comparison/contrast" (NGA & CCSSO, 2010, Grade 7 Writing section). The standards for the non-narrative genres of writing speak to the necessity of perspective taking skills, in ways that encourage students to think from alternative perspectives, either to support their own claims or to compare and contrast different sides of an issue. Moreover, the standards for reading literature state that students should

be able to analyze how an author develops and contrasts points of view of different characters or narrators, while for informational text, students should be able to determine the author's purpose and how they distinguish their position from that of others (NGA & CCSSO, 2010). Therefore, perspective taking is a required skill for all types of writing, including source-based analytical writing (Graham & Harris, 2017; Kim, 2020a; Kim & Park, 2019).

However, there are some challenges that adolescent writers face in portraying different perspectives in their writing. The first challenge lies in their lack of capacity to consider alternative perspectives in their arguments (Ferretti & Graham, 2019; Lapsley & Murphy, 1985; also see Selman, 1981 for developmental stages of social perspective taking). Literature on argumentative writing has shown that adolescent writers are not fully able to employ different perspectives in their argumentative writing, which leads to a high frequency of myside bias, or total exclusion of otherside arguments (Ferretti & Fan, 2016; Wolfe & Britt, 2008). Moreover, expressing perspective taking in writing is a challenging task for those adolescents who failed to achieve even the basic writing proficiency. In fact, only around a quarter of students at both grades 8 and 12 scored at or above the proficient level on the National Center for Educational Progress (NAEP) writing assessment (National Center for Education Statistics, 2012). Without strong foundational language skills, such as vocabulary and syntax (Kim & Park 2019), writer's complex reasoning skills, such as perspective taking, may be easily constrained in their writing. Therefore, the double challenge of my-side bias and lack of foundational language skills would hinder students from developing and representing various perspectives in their written composition.

Operationalization of perspective taking in writing

Perspective taking has been studied in several lines of work—theory of mind, audience awareness, and epistemological understanding. Theory of mind is the ability to understand others' mental and emotional states and predict their behaviors (Howlin et al., 1999; Wollman-Bonilla, 2001), and has been shown to be related to reading comprehension (e.g., Atkinson, Slade, Powell, & Levy, 2017; Kim, 2017) and written composition (e.g., Kim, 2020a; Kim & Park, 2019). For example, in Kim (2020a), fourth graders' ability to infer a character's belief about another character's thought was related to their writing quality via discourse oral language, even after accounting for other skills that are important to writing, such as spelling, handwriting fluency, vocabulary, grammatical knowledge, working memory, and attentional control. In another study, researchers used the Social Perspective Taking Acts Measure (SPTAM; Diazgranados, Selman, & Dionne, 2016), which is built upon theory of mind tasks and asks students for recommendations for a social situation that involve perspective taking. Students' written responses were coded and analyzed for different levels of acknowledgement, articulation, and positioning of different perspectives. Results showed a positive association between social perspective taking skills with literacy performance for students in Grades 4–8 (LaRusso et al., 2016; Kim, LaRusso, Hsin, Harbaugh, Selman, & Snow, 2018).

Perspective taking is also related to how writers consider their audience in their writing (Carvalho, 2002; Kim & Park, 2019). Studies have examined the importance of audience awareness for experienced writers, as they set goals and continually evaluate their writing to communicate better with their anticipated readers (MacArthur, 2007; Nussbaum & Kardash, 2005). In one study, audience awareness was examined by the extent to which compositions included background information needed for an imagined reader who does not have any prior knowledge about their topic (Carvalho, 2002). In another study, audience awareness was identified through the specific linguistic moves taken by fifth and eighth grade writers (Midgette et al., 2008). Here, the researchers defined that the incorporation of opposing reasons and rebuttals as well as the use of language that engages audience (e.g., have you ever thought about it; how would you feel) indicate how the students take their audience into consideration when writing.

Lastly, perspective taking is associated with one's development of epistemological understanding. According to Kuhn, Cheney and Weinstock (2000), epistemological understanding involves the coordination of subjective and objective dimensions of knowing, and it develops in a systematic progression. The first stage is Absolutism, where knowledge is considered objective and certain; individuals at this stage think only from one side of an issue that they believe to be true (i.e., own-side perspective). The next stage is Multiplism, where knowledge is considered multiple, subjective, and uncertain; individuals at this stage account for multiple perspectives to an issue but are not yet able to make an informed decision regarding which one works the best. The final stage is Evaluativism, where knowledge is deemed constructed and uncertain, leading to the need for it to be evaluated; individuals at this stage are capable of gauging the validity of different perspectives and drawing their tentative conclusion on an issue. The developmental progression reflects how people consider their own as well as others' perspectives when constructing their knowledge base (Barzilai & Eshet-Alkalai, 2015; Barzilai & Weinstock, 2015), and therefore reflects development of perspective taking. In this line of work, studies have explored how the development of epistemological understanding is reflected in argumentative writing. Researchers have coded for such epistemological understanding or complex reasoning skills in argumentative essays written by early adolescent writers (Kuhn & Crowell, 2011; Taylor et al., 2019). In these studies, each T-unit (Hunt, 1965) was coded based on four criteria: non-argument (states position with no support; unclear; repeated), own-side only (offers only positives of the favored position), dual perspective (offers negatives of the opposing position), and integrative perspective (includes negatives of the favored position or positives of the opposing position). The coding scheme illustrates how student writing exhibited one or two sides of an issue, or how well it accounted for different perspectives, to advance their thought. Adopting the coding scheme, Taylor et al. (2019) reported that essays written on binary topics (e.g., Is the death penalty justified?) and those that contained more adversative connectives (e.g., although, however) displayed higher levels of epistemological understanding or argument sophistication.

Perspective taking and student demographic characteristics

Previous studies reported that the relation of perspective taking to writing quality may differ for students with different demographic characteristics such as language learner status and sex. For example, language proficiency might play a role in perspective taking to the extent that language plays a constraining role in the development of perspective taking (Kim & Park, 2019). For example, in the theory of mind literature, studies have consistently shown the role of language skills such as vocabulary and syntactic knowledge (de Villiers & de Villiers, 2009; Hughes, 1998; Kim, 2015; Ruffman, Slade, Rowlandson, Rumsey, & Garnham, 2003). However, the majority of these were conducted with young children (e.g., prekindergartners and kindergartners). If language plays a role in perspective taking, there might be a difference in perspective taking as a function of English language learner (ELL) status. However, extant limited research showed mixed findings. Kim et al. (2018) reported that ELLs were more likely to score lower than their English Only (EO) counterparts on social perspective taking acts. On the contrary, Taylor et al. (2019) reported that there were no significant differences for argument sophistication as a function of ELL status.

Studies have also reported the relation between students' sex and perspective taking, such that social perspective taking skills were higher for female students than their male counterparts (LaRusso et al., 2016; Kim et al., 2018) and female students exhibited higher perspective taking in writing (Taylor et al., 2019). Studies also have shown that female students typically score higher than do male students on writing tasks (Kim et al., 2015; Maki, Voeten, Vauras & Poskiparta, 2001; Midgette et al., 2008; Reilly, Neumann, & Andrews, 2019). Overall, these studies suggest that female students may have stronger perspective taking skills and writing skills. Although theoretical explanations about sex differences in perspective taking are not clear, we aimed to examine and replicate whether there is a sex difference in perspective taking in writing in our sample.

Present study

Perspective taking is hypothesized to be an important skill for establishing coherence and sophistication in writing (Kim, 2020a; Kim & Schatschneider, 2017). The present study builds on previous studies by bringing together different strands of research to establish a comprehensive conceptualization of perspective taking and its role in writing, using data from students in Grade 7. Specifically, we coded perspective taking in written compositions informed by multiple lines of literature on theory of mind, audience awareness, and development of epistemological understanding. It should be noted that although writing as an act of communication is expected to present an opportunity to develop perspective taking, whether writing, compared to other mediums, facilitates development of perspective taking was not the focus on the present study. The following were research questions in the present study:

1. To what extent do 7th grade students incorporate perspective taking in source-based analytical writing?
2. How does the extent of perspective taking portrayed in writing differ by students' demographic backgrounds, such as sex and English language learner status?
3. Is perspective taking in writing related to overall writing quality, controlling for demographic backgrounds?

We predicted that early adolescents write more from their own perspective than that of others (Wolfe & Britt, 2008). We also predicted that female students exhibit higher levels of perspective taking than their male counterparts (LaRusso et al., 2016; Midgette et al., 2008). We did not, however, have a clear hypothesis about the difference in perspective taking as a function of ELL status, given mixed findings (Kim et al., 2018; Taylor et al., 2019). Lastly, we hypothesized that the higher the extent of perspective taking expressed in writing, the better the writing quality, given the hypothesized role of perspective taking in writing (Kim, 2020a; Kim & Park, 2019).

Method

Participants

Data for this study were 195 seventh grade students' source-based analytical essays drawn from the Pathway Project, a teacher professional development focused on promoting cognitive strategies approach to teaching text-based analytical writing for students in secondary schools (Olson, Matuchniak, Chung, Stumpf, & Farkas, 2017). In this study, we used 'pretest' data before students were exposed to different conditions (i.e., treatment or control). Of the total of 520 Grade 7 students, approximately 200 essays were randomly selected from 10 classrooms: five classrooms that were given one prompt (Haiti: Sometimes, the earth is cruel) and five others given the other prompt (Man in the water). Within each class, 18–20 essays were randomly selected, and the number of essays for the given prompts were 97 and 98, respectively. According to the participating teachers, the district did not have any formal writing curriculum, and teachers differed in the approaches they used for writing instruction.

The final sample of 195 students (50.7% boys) were from ten classes in seven schools in Southwestern part of the United States. There were approximately 48% Hispanic, 22% Asian, 13% Caucasian, 16% American Indian, and 1% African American students. Approximately 71% were eligible for free and reduced-price lunch. With regards to students' ELL status, approximately 18% were designated ELL, 47% were reclassified as fluent in English proficiency (RFEP), 4% were initially fluent in English proficiency (IFEP), and 30% spoke English only (EO). The districts' records indicated that 6 students received special education services.

Measures

Written composition

Students wrote a timed, on-demand, text-based analytical essay where students' task was to interpret the theme of either one of the two nonfiction newspaper articles. The first article, *HAITI: Sometimes, the Earth is Cruel* (Earth hereafter), written by Pitts (2010), described the Haitian people's response to the natural disaster that struck their country. The second article, *The Man in the Water* (Man hereafter), written by Rosenblatt (1982), told a story about a man who risked his life to save his fellow passengers from a plane crash. The readability according to the Flesch Kincaid was 7.6 for both texts (Klare, 1974). Two days were allocated for the assessment procedure. On the first day, teachers read the article while the students read along. On the second day, the students wrote their essay with access to the source-texts so that they could refer back to the texts during writing. Students were asked to write about one important theme in the source text. Directions stated that a theme is a claim about the author's message and that the author did more than presenting the facts objectively through crafting their text to create an impression on the readers.

Writing quality Overall writing quality of essays was evaluated using a holistic rubric, which assessed "the quality and depth of the interpretation, the clarity of the thesis, the organization of ideas, the appropriateness and adequacy of the evidence, sentence variety, and the correct use of English-language conventions" (Olson et al., 2017, p.11). Students' handwritten essays were transcribed into a digital format, which was used in holistic scoring. A score of 6 denoted exceptional, 5 commendable, and 4 adequate achievement, while a score of 3 represented some evidence, 2 little evidence, and 1 minimal evidence of achievement. Raters were trained with anchor texts for each score. Each essay was independently scored by two raters, resulting in 38% exact agreement and 93% within one-point agreement. Total writing quality score was generated by adding the two ratings. Essays that the two raters disagreed by more than 1 point were scored additionally by a third rater who was an experienced professional. Approximately 6% of the essays (13 out of 195) were scored by a third rater, in which case the third rater's score fell between or corresponded to one of the two raters' scores. For the essays read by a third rater, the total score was determined either by using the third rater's score along with the one that was closer to the third rater's score than the score that was more discrepant, or doubling the third rater's score when it was exactly in between the two (see Olson et al., 2017 for further details). Therefore, all essays were given the total writing quality score ranging from 2 to 12 (i.e., two raters' scores on a 6-point scale).

Perspective taking Based on the literature review (theory of mind, audience awareness, complex reasoning reflecting epistemological development), we developed an analytic scoring method for perspective taking. Our coding scheme focused

exclusively on identifying perspective taking, not other aspects of writing such as content, organization, or language. First, essays were broken into T units. The T unit consists of an independent clause with or without any dependent clause (Hunt, 1965) and is widely used as the unit of analysis in written and spoken discourse (Reznitskaya, Kuo, Glina, & Anderson, 2009). Note that if there were multiple T units, but they were direct quotes from the source text, they were coded as a single T unit. This was done for the purpose of weighting the quoted units less than the original units written by the students when counting the total number of T units. After identifying T units in essays, each T unit was coded for perspective taking by identifying whose mental and emotional states it was presenting. Each T unit was coded as one of the following four: (a) no perspective, (b) own-side only perspective (own-side perspective hereafter), (c) dual perspective, and (d) integrated perspective. T units were coded as no perspective if T units did not portray a perspective, many of which included repetitive, linguistically uninterpretable, substantively irrelevant, or descriptive statements (e.g., direct quotes or paraphrases from the source text). T units that portrayed the student writer's own perspective was coded as own-side perspective, which is in line with absolutism according to the literature on epistemological understanding. For example, "*In my opinion, the author wrote this article to tell people to be grateful for all we have*." Dual perspective was a T unit that exhibited a perspective beyond the student writer's own perspective, including that of source-text author's or character's or readers' perspective, which is in line with the literature on theory of mind, audience awareness, and epistemological development (i.e., multiplism). Examples of the dual perspective include perspective of the author of the article by stating, "*For example, the author wants you to keep in mind how Haiti gets up and keeps living*," or the perspective of the characters in the article that is not the student writer's or the author of the source-text (e.g., "*He then realized if he kept passing the ring he would die*."). We also coded as dual perspective for the T units that situated the readers or audience in a different context such as "*Imagine yourself as a homeless person, no help and no hope, barely survive 7.0 magnitude earthquake*." Integrative perspective was when a T unit accounted for two or more agents' points of view and chose one over the other or offered a third option by providing a rationale (i.e., evaluatism). A total of 248 T-units included in 18 essays were independently coded by the first two authors, which resulted in 95% exact agreement.

Data analysis strategy

To answer the first research question about the extent to which perspective taking is reflected in the students' source-based analytical writing, we looked at the descriptive statistics (see Table 1). In addition to the number of T units that reflect own-side, dual perspective, and integrative perspective, a total perspective taking score (PT score) was calculated by adding the number of own-side perspective multiplied by 1, the number of dual perspective multiplied by 2, and the number of integrative perspective multiplied by 3. This way, perspective taking

Table 1 Indexes generated from coding of perspective taking

Index	Indicator/calculation
No PT units	Number of no PT units
Own-side PT units	Number of own-side PT units
Dual PT units	Number of dual PT units
Integrative PT units	Number of integrative PT units
Total T units	Own-side PT + dual PT + integrative PT + No PT
Total PT score	(Own-side PT × 1) + (dual PT × 2) + (integrative PT × 3)
Proportion of no PT units	No PT/total PT units
Proportion of PT units	(Own-side PT + dual PT + Integrative PT)/total PT units

PT = perspective taking. All units are T units

score reflected the greater weight for higher or more complex perspectives. Furthermore, proportion of no perspective taking units (Proportion of no PT Units), and proportion of perspective taking units (Proportion of PT Units) were created to capture the proportion of T units that portrayed perspective versus not, and were derived by dividing no PT and PT units by the total T units (essay length).

To address the second research question about the relations of students' demographic backgrounds to their perspective taking, multi-level model analyses accounting for students being nested within classes/teachers were performed using STATA IC 15.1 "mixed" command (StataCorp, 2017). Multilevel models produce unbiased estimates of the relations between variables, with precise standard errors and *p* values (Raudenbush & Bryk, 2002). For this analysis, demographic variables predicted the three perspective taking indexes (own-side, dual, and total perspective score), controlling for the total T units and the writing prompts. Integrative perspective score was not used in the analysis because none of the essays included a T unit for an integrative perspective (see the Results section). An example equation for the Own-side Perspective Score outcome is as follows:

$$Own{-}Side\ PT_{ij} = \gamma_{00} + \gamma_{10}\ Total\ T\ Unit_{ij} + \gamma_{20}\ Earth\ Prompt_{ij} + \gamma_{30}\ English\ Learner_{ij} \ldots + u_{0j} + e_{ij}$$

where i represents the ith student; j represents jth classroom; γ_{00} represents the overall mean, γ_{10} represents the slope for Total T unit, γ_{20} represents the slope for Earth Prompt, and γ_{30} represents the slope for English learner status and so on for all the level 1 predictors; u_{0j} indicates the class level residual, and e_{ij} refers to the student level residual. For students' English proficiency, three variables were created, ELL, multilingual students who were either RFEP or IFEP, and EO. RFEP and IFEP were combined because of the small sample size of students in the IFEP group ($N = 9$).

To address the third research question about the relation of perspective taking to writing quality, four multilevel models were run. The first three models included each of the own-side, dual, and perspective taking score; and the fourth model included both own-side and dual perspective taking together as predictors of overall writing quality score, controlling for student demographics, total T units, and prompts.

Results

Research question 1: descriptive statistics and preliminary analysis

Table 2 shows the descriptive statistics. On average, seventh grade students wrote approximately 13 T units in their essays, with slightly fewer than half of them portraying own-side perspective, approximately 1 unit portraying dual perspective, and none portraying integrative perspective. The proportion of units that portrayed perspectives versus those that did not were similar, each taking up approximately half of the total number of T units. There was sufficient variation around the mean score for all the indexes, except for one; dual perspective taking unit had a standard deviation that was larger than its mean and was right-skewed. Therefore, we transformed dual perspective unit to its square root form and used it for subsequent analyses. All other variables were used in their raw forms.

Table 3 shows the bivariate correlations among writing quality score, perspective taking, total T units, assignment to two different prompts, and student demographics. Own-side perspective, dual perspective, total perspective taking score (PT score), and total T units were all moderately related to writing quality score ($0.42 \leq rs \leq 0.60$). Assignment to Earth prompt versus Man prompt was weakly related to both writing quality and four perspective taking indexes ($0.16 \leq rs \leq 0.26$). Notably, there was a positive, albeit weak, relation between female students and both writing quality ($r = 0.20$) and dual perspective units ($r = 0.24$). Additionally, ELL status had weak negative relations to all perspective taking and writing quality variables ($-0.25 \leq rs \leq -0.19$) except for total T units.

Research question 2: relations of student demographics to perspective taking

Results of multilevel models are presented in Table 4. Intraclass correlations in own-side perspective and perspective taking scores were 0.21 and 0.22, respectively, whereas intraclass correlation in dual perspective was 0. In other words, approximately 21 and 22% of total variance in the number of own-side perspective units and

Table 2 Descriptive statistics of perspective taking indexes

Variable	Mean	SD	Min	Max	Skewness	Kurtosis
No PT units	6.44	3.80	0.00	21.00	0.97	4.19
Own-side PT units	5.28	3.53	0.00	16.00	0.71	3.04
Dual PT units	1.14	1.29	0.00	7.00	1.53	5.86
Integrative PT units	0.00	0.00	0.00	0.00		
Total T units	12.86	5.51	1.00	28.00	0.47	2.82
PT score	7.56	5.08	0.00	28.00	1.21	4.71
Proportion of no PT units	0.51	0.21	0.00	1.00	−0.04	2.53
Proportion of PT units	0.49	0.21	0.00	1.00	0.04	2.53

$N = 195$. PT = perspective taking. SD = standard deviation. All units are T units

Table 3 Correlation between overall writing quality score, four perspective taking indexes, assignment to prompt, and student demographics

Variable	1	2	3	4	5	6	7	8
1. Writing quality	–							
2. Own-side PT	0.54***	–						
3. Dual PT	0.42***	0.31***	–					
4. PT score	0.60***	0.88***	0.69***	–				
5. Total T unit	0.58***	0.70***	0.36***	0.71***	–			
6. Earth prompt	0.26***	0.16*	0.16*	0.21**	0.13	–		
7. Female	0.20**	0.04	0.24***	0.14	0.04	–0.08	–	
8. FRPL	−0.15*	−0.22**	−0.13	−0.23**	−0.13	−0.07	−0.01	–
9. ELL	−0.25***	−0.23**	−0.19**	−0.24***	−0.12	−0.19**	−0.08	0.22**
10. ML	0.24***	0.06	0.12	0.10	0.07	0.17*	−0.00	0.20**
11. EO	−0.05	0.13	0.03	0.10	0.02	−0.02	0.08	−0.41***
12. Hispanic	−0.13	−0.20**	0.01	−0.15*	−0.12	0.11	−0.03	0.34***
13. White	−0.06	0.06	0.03	0.05	−0.01	−0.09	0.10	−0.32***
14. Asian	0.28***	0.26***	0.12	0.27***	0.16*	0.20**	−0.07	−0.33***
15. Black	−0.06	−0.02	−0.02	−0.02	−0.10	0.00	0.00	0.06
16. American Indian	−0.07	−0.08	−0.16*	–0.13	0.02	–0.29***	0.02	0.18*
17. Special education	0.09	0.05	0.01	0.03	0.17*	−0.12	−0.18*	−0.02

Variable	9	10	11	12	13	14	15	16
1. Writing quality								
2. Own-side PT								
3. Dual PT								
4. PT score								
5. Total T unit								
6. Earth prompt								
7. Female								

Table 3 (continued)

Variable	9	10	11	12	13	14	15	16
8. FRPL								
9. ELL	–							
10. ML	−0.50***	–						
11. EO	−0.31***	−0.67***	–					
12. Hispanic	0.21**	−0.00	−0.18*	–				
13. White	−0.15*	−0.31***	0.47***	−0.38***	–			
14. Asian	−0.22**	0.26***	−0.10	−0.51***	−0.21**	–		
15. Black	−0.05	−0.10	0.16*	−0.10	−0.04	−0.05	–	
16. American Indian	0.11	0.03	−0.13	−0.42***	−0.17*	−0.23**	−0.04	–
17. Special education	0.22**	−0.12	−0.05	0.01	−0.07	0.05	−0.02	0.00

$N = 195$. PT = perspective taking. FRPL = free and reduced-price lunch. ELL = english language learners. ML = multilinguals who are either Reclassified or Initially Fluent in English Proficiency. EO = english only. Dual PT is in its square root form. All units are T units

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

Table 4 Multilevel models: perspective taking indexes predicted by student demographic information

	Model 1 Own-side PT	Model 2 Dual PT	Model 3 PT Score
Fixed effects			
Intercept	0.61	0.12	0.43
	(0.76)	(0.18)	(1.08)
Total T units	0.43***	0.04***	0.62***
	(0.03)	(0.01)	(0.05)
Earth prompt	0.22	0.10	0.73
	(0.53)	(0.10)	(0.77)
Female	0.03	0.32***	1.08*
	(0.34)	(0.09)	(0.47)
Free and reduced-price lunch	−0.18	−0.12	−0.92
	(0.48)	(0.12)	(0.67)
English Language learner	−1.21*	−0.11	−1.16
	(0.58)	(0.15)	(0.80)
Multilingual	−0.63	0.10	−0.22
	(0.47)	(0.12)	(0.65)
Hispanic	−0.59	0.05	−0.95
	(0.62)	(0.16)	(0.85)
Asian	0.38	0.00	0.24
	(0.68)	(0.17)	(0.94)
Black	0.85	0.18	1.99
	(1.75)	(0.46)	(2.41)
American Indian	−0.77	−0.22	−1.89
	(0.73)	(0.18)	(1.02)
Special education	−0.87	0.10	−1.09
	(1.06)	(0.27)	(1.46)
Variance components			
Classroom	0.60	0	0.92
Children	2.31	0.61	3.19
Intra class correlation	0.21	0	0.22

Standard errors in parentheses. $N = 195$. PT = perspective taking. All units are T units. Dual PT is in its square root form. White English Only students are the reference group

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

the perspective taking score in students' essays, respectively, were attributed to differences among classes while none was attributed to differences across classrooms in dual perspective.

ELL status was uniquely and negatively related to own-side perspective ($p < 0.05$) after accounting for the writing prompt and the total T units in their essays as well as demographic variables in the model. However, ELL status was not significantly related to either dual perspective ($p > 0.05$) or perspective taking score ($p > 0.05$), after controlling for all other variables. In addition, female students' essays exhibited uniquely

Table 5 Multilevel models: writing quality predicted by perspective taking indexes controlling for student demographics

	Model 1	Model 2	Model 3	Model 4
Fixed effects				
Intercept	2.37***	2.36***	2.37***	2.30***
	(0.40)	(0.40)	(0.39)	(0.39)
Own-side PT units	0.09**			0.09**
	(0.03)			(0.03)
Dual PT units		0.23*		0.22*
		(0.12)		(0.11)
PT score			0.07**	
			(0.02)	
Total T units	0.08***	0.11***	0.07***	0.07***
	(0.02)	(0.02)	(0.02)	(0.02)
Earth prompt	0.47	0.48	0.45	0.45
	(0.39)	(0.38)	(0.37)	(0.38)
Female	0.61***	0.54***	0.54***	0.54***
	(0.14)	(0.15)	(0.14)	(0.14)
Free and reduced-price lunch	−0.19	−0.15	−0.13	−0.14
	(0.21)	(0.21)	(0.21)	(0.21)
English language learner	−0.07	−0.16	−0.10	−0.04
	(0.24)	(0.24)	(0.24)	(0.24)
Multilingual	0.40*	0.32	0.36	0.39*
	(0.20)	(0.20)	(0.20)	(0.19)
Hispanic	−0.12	−0.16	−0.09	−0.10
	(0.26)	(0.26)	(0.26)	(0.26)
Asian	0.40	0.42	0.41	0.40
	(0.28)	(0.29)	(0.28)	(0.28)
Black	0.22	0.23	0.16	0.16
	(0.72)	(0.73)	(0.72)	(0.71)
American Indian	−0.02	−0.03	0.05	0.04
	(0.31)	(0.32)	(0.31)	(0.31)
Special education	0.09	0.02	0.11	0.08
	(0.44)	(0.45)	(0.44)	(0.44)
Variance components				
Classroom	0.57	0.54	0.54	0.55
Children	0.95	0.96	0.95	0.94
Intra class correlation	0.38	0.36	0.36	0.37

Standard errors in parentheses. $N = 195$. PT = perspective taking. All units are T units. Dual PT is in its square root form. White English Only students are the reference group

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

positive relations to both dual perspective ($p < 0.001$) and perspective taking score ($p < 0.05$) after accounting for prompt, total T units, and all demographic variables. However, there was no statistically significant relation between sex and own-side perspective taking units ($p > 0.05$), after controlling for all other variables. Students' socioeconomic status, special education status, and race/ethnicity were not uniquely related to own-side perspective, dual perspective, or perspective taking score after accounting for total T units, prompt, and demographic variables ($ps \geq 0.05$).

Research question 3: relations of perspective taking to overall writing quality

Results of the multilevel models are presented in Table 5. Intraclass correlations across the four models ranged from 0.36 to 0.38; that is, approximately 36–38% of total variance in students' writing quality score was attributed to differences among classrooms. As shown in Models 1, 2, and 3 in Table 5, own-side perspective, dual perspective, and perspective taking score all respectively had unique positive relations to overall writing quality, accounting for total T units, prompt, and the other student demographic variables ($ps < 0.05$). Furthermore, in Model 4, dual perspective was still uniquely and positively related to writing quality ($p < 0.05$), when accounting for own-side perspective as well as total T units, prompt, and demographics.

Discussion

Perspective taking, one's knowledge of their own mental and emotional states and inferences about mental states of others, is identified as an important higher order cognitive skill involved in writing development (Kim, 2020a; Kim & Park, 2019). The present study examined the source-based analytical essays of 195 seventh grade students to extend our understanding of the role of perspective taking in adolescent writing. Specifically, the study investigated the extent to which students incorporated different levels of perspectives, how they varied by student demographic backgrounds, and the relation between perspective taking and overall writing quality score. Some of the most notable contributions of the present study include (a) developing an understanding of perspective taking in writing by drawing on and integrating relevant literature, (b) finding relations between perspective taking in writing and certain demographic characteristics, and (c) highlighting a positive relation between perspective taking and quality of writing.

To begin with, the present study broadened our understanding of how perspective taking is represented in written composition. Studies on argumentative writing have developed coding schemes to identify students' complex reasoning skills based on the development in epistemological understanding (Kuhn & Crowell, 2011; Taylor et al., 2019). However, they focused exclusively on how opposing sides of an issue were incorporated into argumentative writing and thus had a limited scope in defining perspective taking for writing in general. In the present study, we specified various levels of perspective taking in source-based analytical writing that encompass those identified for complex reasoning in argumentative writing as well as those

informed by theory of mind and audience awareness. We identified as dual perspective for those units that portrayed the source text author's or characters' perspectives, and those that situated the readers in a context. Overall, we found that there was more own-side perspective than dual perspective in seventh grade writing, which was similar to the results by Taylor et al. (2019) with students in grades 6 through 8. A possible explanation for this is that incorporating others' perspectives in writing is an advanced skill such that adolescent writers' writing is characterized with mostly myside bias (National Center for Education Statistics, 2012; Wolfe & Britt, 2008).

Unlike previous studies (Kuhn & Crowell, 2011; Taylor et al., 2019), we did not find any integrative perspective portrayed in our sample of essays. This may be explained by the differences in the prompt or the genre of writing. It has been found that essays responding to binary prompts showed higher argument sophistication than those responding to open-ended ones (Lawrence, Niiya & Warschauer, 2015; Taylor et al., 2019). Whereas in the study by Taylor et al. (2019), students wrote an argumentative essay to both binary (e.g., Is the death penalty justified?) and open-ended (e.g., Who is responsible for teen smoking?) response prompts, the students in our sample wrote source-based analytical essays, where they identified the theme of newspaper articles. Different writing tasks and prompts likely elicit perspective taking to a different extent. We speculate that as the prompt on identifying a theme did not explicitly elicit any conflicting sides to an issue, it was more difficult for the students in our study to represent their integrative perspective.

We also found some differences in the extent of perspective taking portrayed in writing by sex and ELL status. We observed that female students performed better in incorporating different agents' perspectives than their male counterparts. This is in line with previous research which reported that females displayed higher perspective taking or argumentation skills (LaRusso et al., 2016; Taylor et al., 2019). Explanations for this consistent finding is beyond the scope of the present study, and future studies are needed. Moreover, we found that ELLs wrote significantly fewer T units of own-side perspective but not dual perspectives, compared to their EO counterparts, after accounting for their essay length. This finding indicates that ELLs had comparable performance on dual perspectives in their essay, although they included fewer instances of own-side perspective. This result is in line with the study by Taylor et al. (2019) where there were no significant differences in argument sophistication by students' language learner status. Therefore, it may be the case that ELLs are not necessarily falling behind their non-ELL peers in their higher-order skill of taking multiple perspectives and expressing them in their writing, at least in representing dual perspective.

Lastly, the present study highlighted the importance of portraying multiple perspectives in quality writing. Greater inclusion of own-side perspective or dual perspective was positively related to quality writing. In particular, dual perspective was independently related to writing quality even after accounting for own-side perspective, essay length, writing prompt, and other demographic backgrounds. This finding is consistent with previous research showing the relation of perspective taking (operationalized as theory of mind and SPTAM) to literacy outcomes (Kim, 2017, 2020a; Kim et al., 2018; LaRusso et al., 2016). Although the holistic rubric for overall writing quality did not explicitly evaluate perspective taking as a criterion (Olson

et al., 2017), our study confirmed that an essay written from multiple perspectives is more likely to be rated as quality writing than those written solely from the writer's own perspective. Overall, the present finding, together with the previous ones, support the role of perspective taking in quality writing (Kim, 2020a; Kim & Park, 2019).

Limitations and future research

There are several limitations of this study to be considered for interpreting the findings and associated directions for future research. First, the sample in the present study came exclusively from seventh grade students' source-based analytical writing as part of the Pathway Project (Olson et al., 2017) and therefore, future studies can replicate the present study with students in different grade levels. Another important direction for future study is extending the present study using multiple writing tasks in different genres, such as narrative and different types of informational genres. The present study was limited to examining only one essay per student, which may not be enough to fully portray students' perspective taking skills in writing. Furthermore, the exact agreement rate of raters for the holistic writing outcome was less than ideal. Note, however, that the scores used in the present study were not from single raters, but instead combined scores of two raters, and a third expert rater score was assigned for discrepancies larger than a 1 point difference. Future studies with higher exact agreement rate is needed to replicate the present study. A fourth limitation is that in source-based writing tasks, students' reading skills likely influence students' writing performance. Although the source texts were read aloud by the teachers while the students were reading along, students' reading skills might have played a role as they accessed source materials during the composition process. Future studies should measure students' reading skill and its role in relation to perspective taking manifested in writing. Lastly, the present study was restricted to identifying perspective taking represented in writing and did not include a measure of perspective taking skill. According to DIEW (Kim, 2020a; Kim & Park, 2019), perspective taking skill would predict the extent to which multiple perspectives are represented in written composition, which, in turn, would predict overall writing quality. Adding measures of perspective taking skill (e.g., theory of mind, SPTAM) can examine this hypothesis.

Implications and conclusion

Overall, the present study suggests that incorporating multiple perspectives is important in quality source-based writing. Given the correlational nature of the present study, our findings are limited for pedagogical implications. However, preliminary implications, provided future causal evidence, include that students in secondary schools may benefit from instructional attention in perspective taking in writing. For example, teachers can provide opportunities more explicitly and systematically

for students to understand multiple perspectives and incorporate them into writing. When teaching source-based analytical writing, teachers can teach and engage in quality discussion on various perspectives represented in the source text (the author of the source materials, different characters in the source writing). Teachers can also explicitly discuss the goal of a specific writing task, and the needs of the intended audience and associated strategies to address them (e.g., provide background knowledge, define some key concepts or terms). Effective instructional approaches to enhance perspective taking and their effects on writing need to be investigated in future studies. Although further efforts are certainly needed to extend the findings, this study took an important step toward enhancing our understanding of the role of perspective taking in written composition.

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