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Sign and indexicality: a case study of enhancing alignment of situation models in SCWT

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Abstract: The story continuation writing task (SCWT) is a newly emerging proficiency test of National Matriculation English Test (NMET) in three provinces in China. Nevertheless, little is known with respect to how test-takers enhance their alignment of situation models in SCWT. This paper reports on a case study of the development of situational alignment of one L2 (second language) learner in a senior high school in Jiangsu Province, China, drawing on qualitative data collected via individual face-to-face interviews, and supplemented by face-to-face conversations and email exchanges, over a period of one year. This study investigates how the test-taker enhances her alignment of situation models, and what factors contribute to her development of situational alignment under the framework of a new semiotic research finding, a pan-indexicality model. This paper concludes that test-takers possess the capacity of developing their alignment of situation models, and that a pan-indexicality model, affording opportunities for test-takers to accurately decode the meaning of a linguistic sign at the overall sense level, plays a decisive role in identifying and integrating key dimensions of situation models and eventually enhancing test-takers’ situational alignment. This study suggests that a pan-indexicality model can be employed by test-takers to understand the meaning of a linguistic sign at the overall sense level, and test-takers’ encyclopedic knowledge, contextual information, and personal emotions regarding a linguistic sign should be highlighted in classroom instruction to help test-takers construct aligned situation models in SCWT.

Keywords: alignment of situation models; linguistic sign; Pan-indexicality model; SCWT

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1 Introduction

In recent years, the story continuation writing task (SCWT) has gained recognition in the National Matriculation English Test (NMET) in Zhejiang, Shandong, and Jiangsu provinces in China (Hu 2021). This newly emerging type of reading-writing integrated task demands test-takers to complete narrative stories based on input texts. Research has established the significance of alignment (Jiang and Chen 2015; Jiang and Xu 2016; J. Wang 2019; Q. Wang 2019; Wang and Hong 2021; Wang and Wang 2015; Yang 2015; Zhang 2018), at both linguistic and situational levels, mainly lying in tackling the asymmetry between comprehension and production via learner-text interaction. Despite the observed effects of the linguistic alignment on accuracy (Jiang and Tu 2016; Q. Wang 2019; Wang and Wang 2015; Zeng et al. 2017; Zhang and Zhang 2021) and complexity (Mao and Jiang 2017; Wang et al. 2021; Yang 2015) of L2 writing, little is known with respect to the effect of situational alignment in L2 written production. One study (Zhao 2021), in particular, investigated the effect of situational alignment on producing less meaning-related errors in L2 writing, and confirmed its strength. Nonetheless, it employed true or false reading comprehension task concerning five key dimensions of situation models to enhance alignment, which is applicable exclusively in empirical experiment condition, rather than within the testing context. Correspondingly, few initiatives have been made to investigate how to enhance test-takers’ alignment of situation models in SCWT. According to a new semiotic research finding, indexicality is postulated as being “directional, maintaining a one-way inference” (J. Wang 2019, p. 55) with interpretants’ participation. In this paper, we would apply the pan-indexicality model to the analysis of factors that enhance alignment of situation models in SCWT, aiming to investigate how test-takers enhance their alignment of situation models and what factors influence their development of situational alignment, through an in-depth inquiry of one grade 3 senior high school L2 learner of English in Jiangsu Province.

2 Literature review

2.1 The Xu-argument based SCWT as a proficiency test

Xu-argument, a newly emerging type of view on second language acquisition, claims that language is acquired through xu (续 in Chinese), a Chinese character with a meaning of completion, extension, and creation (Wang 2016). The Xu-oriented research has tested the principles of Xu-argument and the high efficiency in language learning achieved by Xu. It has attracted increasing research

Some studies have been conducted to verify the validity of SCWT as a proficiency test. Wang and Qi (2013) conducted the first empirical study to examine if SCWT is suitable for the use in L2 proficiency test. Data were collected from a sample of 334 grade 3 senior high school L2 learners of English in Guangdong Province. The findings lead to the conviction that the incorporation of SCWT into the NEMT writing section can contribute to the assessment objective of promoting language learning. Hu (2021) conducted a content validity analysis of SCWT in the NMET (Zhejiang Province and Shandong Province) in 2020. The findings indicate that SCWT is not only in line with test-takers’ English proficiency level in China’s EFL context, but also in line with the requirements of General High School English Curriculum Standards 2017.

A study that substantially promotes the understanding of current rate quality of SCWT is Chen and Zhang (2020), which examines the effectiveness of measures of enhancing the rate quality of SCWT in the NMET involving 1,607 grade 3 students in senior high schools. Results indicate that the current NMET rating procedures are suitable for ensuring the rating quality of SCWT.

SCWT has been incorporated into China’s NMET in Zhejiang Province since 2016, Shandong Province since 2020, and Jiangsu Province since 2021. However, the application of SCWT in the NMET context is still in its infancy. Both senior high school students and teachers struggle with many adjustment problems. The potential might be overwhelmed by the requirement of demonstrating one’s writing ability within the testing context (Cohen and Upton 2007). Therefore, more empirical studies should be conducted to accumulate evidence with respect to test-taking response process to promote its assessment use (Zumbo and Hubley 2017).

2.2 Alignment of situation models and meaning-related problems

A phenomenon of emerging interest within language learning is that of alignment (Atkinson et al. 2007; Costa et al. 2008; Pickering and Garrod 2004). Pickering and Garrod (2004) argue, from a psycholinguistic perspective, that alignment is the basis of successful communication in dialogue. Atkinson et al. (2007), from a social
cognitive perspective, hold a holistic view, regarding alignment as a default process of continually aligning oneself with one's sociocognitive environment. In keeping with the conception developed by Pickering and Garrod (2004) and Atkinson et al. (2007), Wang (2012) claims that like interpersonal communication, learner-text interaction involves alignment as well. Wang (2014) argues that the role of alignment in L2 learning occurs at various levels of representation, including linguistic representations (phonetic, phonological, lexical, syntactic, and semantic) and situation models.

Alignment of situation models forms the basis of successful communication (Pickering and Garrod 2004). A situation model is a multidimensional representation of the situation under discussion (Sanford and Garrod 1981), involving five dimensions of space, time, causation, intentionality, and protagonist (Zwaan and Radvansky 1998). The majority of studies on five key situational dimensions have been conducted in isolation (Zwaan and Radvansky 1998). Despite a few studies that have investigated the interrelatedness of the situational dimensions (i.e., Taylor and Tversky 1997; Zwaan et al. 1995), little attention has been directed to integrate key dimensions to enhance alignment of situation models. One study (Zhao 2021), in particular, investigated the effect of situational alignment on producing less meaning-related errors in L2 writing, and confirmed its strength. Nonetheless, this study is exclusively concerned with English majors at university, and employed true or false reading comprehension task concerning situational dimensions to enhance alignment. The strategy is applicable exclusively in empirical experiment condition, rather than within the testing context.

The alignment of situation models in SCWT may be more controlled and strategic than automatic due to a lack of gesture, posture, facial expression, and other environmental affordances available in dialogue. Learners have to consciously align with the situation model built on the input text by going through the following procedure: “first, they need to construct a situation model for comprehension based on the text. Secondly, they need to draw on the situation model so constructed to develop ideas for writing. Thirdly, they need to make sure that their writing coheres or aligns with the situation model they have constructed” (Wang and Wang 2015, p. 507). The procedure provides a road map, but doesn’t undoubtedly ensure correct and appropriate use of L2 and coherence with the input text. For instance, both senior high school students and teachers spare all efforts on reciting chunks and sentences describing smile, tears, joy, sorrow, horror, courage, etc. But most test-takers still encounter setbacks and difficulties in improving meaning-related expressions, which result in poor exam results, no constructive feedback, learning plateaus, and learning demotivation. While senior high school English teachers complain about the new writing task, some of them even tell students that SCWT will last no longer than three years. Little attention
has been directed to completing the story in a coherent and logical way. The alignment of situation models cannot be enhanced through the identification of five key situational dimensions in isolation or through the interference of true or false reading comprehension tasks within the testing context. Hence, potentially costly strategies are required when automatic mechanism cannot produce alignment (Costa et al. 2008; Pickering and Garrod 2004, 2006). The present study just aims so.

2.3 Pan-indexicality model as a solution

One of the key problems of SCWT is that test-takers are not competent in ensuring their written productions to cohere or align well with situation models. Indexicality, one aspect of sign, focuses on sequential or causal relations that feature certain logical inferential properties (J. Wang 2019). Therefore, the present study adopts the framework of a pan-indexicality model to investigate the factors that contribute to the development of situational alignment in SCWT in the NMET context.

Pierce’s trichotomy of symbol, icon and index has been an effective tool for analyzing verbal and non-verbal signs. According to Peirce (1955), index and indexicality are two distinct concepts, the former being associated with a certain type of linguistic sign, while the latter relating to a property of reference that is represented in the former. However, some scholars (e.g., Burge 1982; Doane 2007; J. Wang 2019) have realized that the definition of index and indexicality needs to be adjusted so as to be at the same analytic level as symbol and icon.

Based on the intrinsic connection between sign, index and indexicality in Peirce’s semiotics, J. Wang (2019) proposes his definition of indexicality in terms of pan-index and pan-indexicality. All words are taken as pan-index and contain the essential property of pan-indexicality. When all words are taken as pan-index, a pan-indexicality model is thus proposed to interpret linguistic signs from a brand-new perspective. Figure 1 is a description of the pan-indexical process that affects meaning comprehension.

According to J. Wang (2019), the pan-indexical process interprets a linguistic sign by following Peirce’s classic sign process of sign, object and interpretant, and incorporating the idea of taking all signs as having the basic property of indexicality. A linguistic sign is basically associated with a certain object that waits to be interpreted by an interpretant. The interpretant is classified into interpretant\(^1\) and interpretant\(^{ii}\). Interpretant\(^1\), which is concerned with shared information understood by both the addressee and the addressee, assures the accurate reading of what the object refers to. Interpretant\(^{ii}\), which is about the addressee’s personal
encyclopedic knowledge, perception of the contextual information, and personal emotions in the process of the actual communication, influences the final reading of the linguistic sign. In this model, a linguistic sign reveals formal, conventional and overall sense of the object. Formal sense is understood almost automatically, such as the acoustic form of hiccup which would evoke a sharp, usually repeated, sound made in the throat. The conventional sense, presented as an entry in a dictionary, is a general agreement reached by both the addresser and the addressee. The overall sense is solely associated with interpretant or the addressee’s personal encyclopedic knowledge, perception of contextual information and personal emotions.

In the pan-indexicality model, a linguistic sign is regarded as an index that guides the addressee to understand the meaning of an object at the overall sense level. In SCWT, under the framework of a pan-indexicality model, a linguistic sign or an object encoded and stored in a causal chain of a narrative story might afford opportunities for test-takers to decode the meaning of a linguistic sign and infer the intentionality, which would contribute to the development of alignment of situation models.

All in all, theoretical conceptions and empirical evidences presented above illustrate that the application of SCWT as a proficiency test in the NMET context can generate positive washback, and alignment of situation models form the basis of successful learner-text interaction in SCWT. However, little attempt has been made

Figure 1: The pan-indexical process of a linguistic sign (J. Wang 2019:57).
to explore test-takers’ perspectives regarding how to enhance alignment of situation models. Therefore, the present study, by adopting the framework of a pan-indexicality model distinguished from other alignment-oriented studies so far, aims to investigate the factors that contribute to the development of situational alignment in SCWT in the NMET context.

3 Research method

“The purpose [of case study] is to understand the complexity and dynamic nature of the particular entity” (Johnson 1992, p. 84). Miles et al. (1994) classify case study into single case and multiple cases. The present study is a single case study. A qualitative design assists scholars to “develop an in-depth exploration of a central phenomenon” (Creswell 2012, p. 206). The central phenomenon of this study is a quest for the participant’s enhancement of situational alignment in SCWT in the NMET context.

3.1 Participant

The case selection strategy adopted in this study is intensity sampling, which refers to “a selection of information-rich case but not extreme” (Duff 2011, p. 106). One participant, Kang, took part in this study. The first author (Zhu) knew her well prior to this study. She coached Kang in a tutorial session for nine years. The participant was a grade 3 senior high school student in Suzhou, Jiangsu Province, when this study was carried out. She was willing to share her learning experience of SCWT with the researchers.

Kang’s English proficiency level was among top 5% of her class. At the beginning of the third year in senior high school, she usually got full marks in sections of listening and reading comprehension, 12–13 out of 15 as full marks in the section of English letter writing, but only got 17–18 out of 25 as full marks in SCWT section. She had sufficient confidence in her performance in English tests, but she felt stressed at times because SCWT occupied most of her time spending on English learning, yet yielded the least progress. In her written production of SCWT, there was no shortage of vocabulary or chunks. What she concerned about was how to enhance the alignment of situation models, to reduce meaning-related errors, and ultimately to achieve a higher score of above 20 marks.
3.2 Research questions

The present study, by adopting a qualitative approach, aims to address the following questions:
1) How do grade 3 senior high school students in Jiangsu Province enhance the alignment of situation models in SCWT?
2) What factors influence the development of situational alignment in SCWT?

3.3 Instruments

Research instruments, including face-to-face interviews, face-to-face conversations, and email exchanges, were elaborately designed based on Zwaan and Radvansky’s (1998) five dimensions of situation models, and J. Wang’s (2019) pan-indexicality model.

3.4 Data collection and data analysis

Three semi-structured individual face-to-face interviews in Chinese and each lasting around 2 h, were conducted with the participant to elicit in-depth data. Prior to the interviews, she was guided to sign a consent form acknowledging that 1) she participated in the study voluntarily; 2) she had the right to withdraw from the study at any time of the process; and 3) all interviews were video-taped for research purpose only.

The present study lasted over one year. The procedure is as follows: The first round of interviews was carried out at the beginning of the academic year. The interviews focused on the identification of five dimensions of situation models. The second round of interviews, conducted at the end of term 1, provided the researchers with an access to the latest updates on her development and problems regarding the alignment of situation models. The third round of interviews, conducted at the end of term 2, mainly focused on how she integrated key dimensions of situation models under the framework of a pan-indexicality model and enhanced the alignment intensity in SCWT. During the interviews, open-ended questions were proposed to allow the participant to “create the options for responding … without being forced into research responsibilities” (Creswell and Plano Clark 2006, p. 32).

Data were collected through face-to-face conversations and e-mail exchanges. Information collected from the above sources enriched interview data by depicting a fuller picture of the participant’s development in the alignment of situation models.
Qualitative data analysis employs an “inductive investigative strategy” (Merriam and Tisdell 2009, p. 39). The interviews were first transcribed, coded, and compared with the data collected from supplementary sources to ensure consistency. The thematic structure of the case was then investigated for the theme, which was discussed with reference to research questions.

### 4 Findings

In this section, the key findings of the present study are presented in the form of five situational dimensions of protagonist, time, space, causation, and intentionality. They are concluded with reference to research questions at the end of this section. The evidence from the elicited data provides rich descriptions of how the participant developed the alignment of situation models, and forms the basis for further discussion in the following section.

First, for protagonist-related dimension, distinguishing between main protagonists and less important protagonists is of central importance. Kang usually “drew a circle of the name of each protagonist at his or her first appearance in the input text, and highlighted main protagonists” (1st interview).

Second, for temporal dimension, a story takes place in time to some extent following the chronological order. Readers automatically keep track of temporal information in narrative comprehension. Kang claimed that most stories selected as SCWT in the NMET context took place in a time frame within a short period of time, like one or two days, or one or two months, rather than several decades.

Third, for spatial dimension, it generally refers to the location where the story takes place. In some cases, it also includes the distance between protagonists and objects or the distance in mind. Kang claimed that it was less challenging to “find out the physical location of a story” than to “structure events coherently and logically” (2nd interview).

Fourth, for causal dimension, causal relationships in SCWT are often inferred by test-takers using their encyclopedic knowledge of events across paragraphs. Kang focused on the first sentence of the last two paragraphs, in particular, such as the following:

1a ... the girl asked if I’d had lunch.

1b I ... opened the paper bag.

The encyclopedic knowledge that a paper bag can hold food was activated. The events described in 1a-b are integrated by way of a causal connection. The causal
consequence of events that lunch food was placed in the paper bag could be generated afterwards.

Last, intentionality in narrative comprehension refers to the themes, goals and plans of protagonists. In human behavior, people set up life themes that generate goals to be achieved, and in turn, generate plans of action. In the comprehension of narratives, readers keep track of goal information, which is seldom stated explicitly in input texts and needs to be inferred. A theme–goal–plan hierarchy is a crucial structural mechanism for constructing narrative events.

In Kang’s first version, the narrative story went as follows:

A Mexican family offered help to the author. The author thrust a $20 bill quietly in return for their help. The Mexican family kept the money and gave a souvenir and a card to express their appreciation. The action that the Mexican family took the money as a reward and gave back a souvenir and a thank-you card lead to the realization of a theme of offering help and expecting a reward in return.

In the second version, Kang highlighted the key information of the first sentence of the last two paragraphs. Then she structured an event of the paper bag holding lunch food. However, neither the first nor the second version achieved a mark above 17. After reading her classmates’ written productions that were above 20 marks, she realized that their paper bag all contained the $20 bill together with lunch food. Despite the concern that money should not be placed in the same bag with food considering sanitary condition, Kang resumed to find out the reason why the $20 bill should be put in the paper bag.

Kang strived to figure out how to structure events in the most coherent and logical way possible, asserting as “a goal of above 20 marks” (2nd interview). Comparing the souvenir and thank-you card Kang created on her own with the $20 bill mentioned in the input text, Kang stated that “the latter is better” (3rd interview) due to its global causal relationship. Moreover, it excelled in the intention about what they wanted to convey (“theme construction” as mentioned by Kang). Cues in the input text, such as “a Mexican family in a small truck” at the beginning of the story and “the family will work on a fruit farm for the next few weeks, and then go home.” at the end of the input text, conveyed the background information that the Mexican family was not rich, but hardworking, and a $20 was not a small amount to them. Therefore, the action of giving back the $20 bill can express the emotion of a poor but hardworking and warmhearted family helped a stranger without expecting any reward in return. This is much more meaningful than a theme of offering help and expressing appreciation in return.

The intentionality is often intertwined with the global causal relationship. The $20 bill, mentioned twice in the middle of the input text and placed in the paper bag at the end of the story, generated the theme of the narrative story with personal
emotion. Kang realized that a theme could be inferred through a sign ("an object" as mentioned by Kang) encoded and stored in the situation model by completing a causal chain of a narrative story.

Kang took the initiative to make global causal inferences with the encyclopedic knowledge and contextual information. Meanwhile, she generated motivational influences by taking personal emotions into consideration. She had adopted this strategy in the comprehension and production of narrative texts of SCWT since the beginning of Term 2 and achieved above 20 marks in the NMET Jiangsu Province in 2021 (Her overall score of English test in the NMET 2021 is 143 marks. Full marks are achieved in sections of listening comprehension and reading comprehension, 2 to 3 marks might be deducted in English letter writing section, while 4 to 5 marks might be deducted in SCWT section. In calculation, her score of SCWT section might be 20 or 21 marks).

All in all, Kang found her development in the alignment of situation models both challenging and rewarding. Though she said, from time to time, that as a novice in SCWT, she unavoidably encountered numerous difficulties and constraints in developing the alignment of situation models. Her internal motivation and perseverance drove her to try her best to align well with the narrative text and improve her written production in SCWT. The evidence from the elicited data showed that: 1) the participant developed her alignment of situation models in SCWT through identifying and integrating five dimensions of time, space, causation, intentionality, and protagonist; 2) the participant identified and integrated five situational dimensions through exploring the meaning of a linguistic sign at the overall sense level in a pan-indexicality model, from the perspective of her encyclopedic knowledge, perception of contextual information, and personal emotions.

5 Discussion

This section discusses the experience of the case study participant (Kang) with regard to the two research questions. One point to clarify is that compared with students of lower English proficiency level, the particular internal motivation of achieving above 20 marks which, we have found, might be absent or rather rare in many other contexts. In this respect, she is probably not a typical case according to the authors’ observations and educational experiences (the first author had tutored her for some time in a senior high school in Suzhou, Jiangsu Province at the time of writing this paper, while the second author has been supervising graduate students who are prospective English teachers in primary, junior, and senior high schools for more than two decades). Therefore, this study does not attempt to generalize these findings exclusively to test-takers who are of high English
proficiency level, but to provide a new perspective to all test-takers to understand how they might enhance their situational alignment to improve meaning-related expression in their written production in SCWT.

## 5.1 Development of situational alignment in SCWT

The development of situational alignment of the participant can be divided into three phases (see Figure 2):

- **1st Phase:**
  -protagonist
  -time
  -space
  -1st sentence of the last two paragraphs

- **2nd Phase:**
  -protagonist
  -time
  -space
  -causality
  -Encyclopedic knowledge
  -Contextual information
  -Personal emotions

- **3rd Phase:**
  -protagonist
  -space
  -causality
  -intentionality

Equipped with the knowledge of five dimensions of situation models, the participant was able to capitalize on protagonist-related, temporal and spatial dimensions to complete a story, but with some meaning-related errors in her written production in the first phase. The action that the Mexican family took the money as a reward and gave back a souvenir and a thank-you card, leads to the realization of a theme of offering help and expecting a reward in return, which turns out to be the opposite or at least not in line with the core values.
In the second phase, the participant validated causal relations (Zwaan and Radvansky 1998) between events described across paragraphs by reading back of the first sentence of the last two paragraphs. She constructed a channel of developing her situational alignment by forming causal connection between events described across paragraphs, with the absence of causal connectives.

In the third phase, the participant drew motivational inferences through encyclopedic knowledge, contextual information and personal emotions. Failed goal information is more available than completed goal information (Lutz and Radvansky 1997) presumably because completed goal information is often part of the causal chain of a narrative story that connects several ideas together across paragraphs. Moreover, goal information is seldom stated explicitly in the input text and has to be inferred. Indexation may be needed in expert-novice interactions (e.g., Isaacs and Clark 1987). The process of writing the last two paragraphs of the story in SCWT involves interactions between the author and test-takers, which is similar to that between expert and novice. Kang constructed the overall sense of the paper bag by integrating her encyclopedic knowledge of a paper bag holding packaged food, her perception of contextual information of not having lunch yet, and personal emotion of a poor but hardworking and warmhearted family offering help without expecting any reward in return.

The above three phases showed that the participant developed her alignment of situation models in SCWT through identifying and integrating temporal, spatial, causal, motivational, and protagonist-related dimensions. This finding is different from Zhao’s (2021) finding that the alignment of situation models could be enhanced through True or False reading comprehension task.

5.2 Factors enhancing situational alignment in SCWT

That the participant was able to enhance her capacity to construct aligned situation models is to a large extent attributable to the strategy of identifying key dimensions of situation models and integrating these dimensions in a particular way.

As for identifying and integrating key dimensions of situation models, the causal and motivational dimensions form the backbone of situational alignment (Zwaan and Radvansky 1998). The temporal information is essential to the construction of situation models because it identifies causal and motivational links between events. Test-takers need to figure out the temporal order of events before generating a causal relation. Spatial information is often encoded explicitly in the input text, though not as closely intertwined as temporal information with causal and motivational dimensions. Finally, protagonist-related dimension is a vital
component of situational alignment because it includes more information about protagonists than just their names. Most narrative stories describe the goals and actions of main protagonists. In addition, objects, which are often stored and encoded presumably depending on their causal connections, can also function as a vital element of situation models.

To avoid having the situational alignment excessively complex, “a token often contains a pointer that refers to more generalized information about an entity” (Zwaan and Radvansky 1998, p. 180). The data clearly revealed how a pan-indexicality model (J. Wang 2019) afforded opportunities for test-takers’ efficient integration of key dimensions of situation models. A test-taker’s personal encyclopedic knowledge, perception of the contextual information and personal emotions interact with each other, with some of them being more active while others less so in some cases, constructing the overall sense and exerting influence on what the linguistic sign ultimately means. A description of the pan-indexical process of “the paper bag” can be shown as follows (see Figure 3):

![Figure 3: The pan-indexical process of “the paper bag”.

While the non-linguistic feature of “The paper bag” carries the cultural connotation of takeaway or fast food, the present study analyzes it mainly from the perspective of the linguistic feature. “The paper bag”, a crucial element, was taken as a linguistic sign to guide the participant to find out what objects the Mexican family placed in it. At the formal sense level, “the paper bag” refers to a bag made from paper. At the conventional sense level, it refers to a carrier bag made from paper, for holding purchases. At the above two levels, the participant obtained the
information shared by both the author and the reader. Then move forward to the overall sense level. Kang’s encyclopedic knowledge of paper bag used for holding food in the Western countries makes the contextual information of “the girl asked if I had lunch” integrated with the key word “paper bag” by way of a causal connection. Kang’s personal emotion drove her to bring the story to an end in a way that the $20 bill would be returned by the poor but hardworking and warmhearted Mexican family. The object, the $20 bill, is part of a causal chain of the story and generates motivational influence to the theme of helping others without expecting any reward in return.

Overall, the data clearly reveal how a pan-indexicality model afforded an opportunity for the participant to use her encyclopedic knowledge, perception of contextual information and personal emotions to decode the meaning of a linguistic sign at the overall sense level accurately, which contributed greatly to the identification and integration of key dimensions of situation models. As a result, the participant was able to enhance her alignment of situation models in SCWT. This finding is in line with J. Wang’s (2019) assertion that knowledge owned solely by the addressee plays a key role in understanding the meaning of a linguistic sign at the overall sense level. It is also in line with Pickering and Garrod’s (2004, 2006) assertion that strategies are required when automatic mechanism cannot produce alignment.

The above findings suggest that the strategy of identifying and integrating situational dimensions by exploring the meaning of a linguistic sign at the overall sense level in a pan-indexicality model, from the perspective of encyclopedic knowledge, contextual information, and personal emotions, could enable test-takers to enhance their alignment of situation models in SCWT. It should be noted that despite the contribution of a pan-indexicality model in SCWT, it remains unknown how the model influences situational alignment in the comprehension and production of other types of texts, like expository and argumentative texts.

6 Conclusion

This qualitative inquiry into the learning process of a grade 3 senior high school student demonstrates that test-takers are able to enhance the alignment of situation models in SCWT by exploring the overall sense of a linguistic sign in a pan-indexicality model, from the perspective of encyclopedic knowledge, contextual information and personal emotions. This is a brand-new perspective different from the widely-conducted reading comprehension tasks like true or false and multiple choices in Xu-argument based studies (Peng 2017; Wang 2018; Zhao 2021).
The present study can shed light on how test-takers enhance their alignment of situation models in SCWT, uncovering the learning mechanism underlying it. It is suggested that a pan-indexicality model can be introduced to test-takers and encyclopedic knowledge, contextual information and personal emotions regarding a linguistic sign should be highlighted in classroom instruction to help test-takers construct aligned situation models. “The strengths of one approach tend to be the weaknesses of the other” (Duff 2011, p. 39). On the basis of the present single longitudinal case study of Kang, it is impossible to predict whether other test-takers would exhibit the exact same developmental patterns or difficulties as Kang. Yet there is reason to believe that other test-takers in SCWT might also manifest similar development of situational alignment. To understand the uniqueness or typicality of Kang’s development of situational alignment, a larger study would be necessary, such as additional in-depth longitudinal case studies of several test-takers or a cross-sectional study of many test-takers in SCWT in the NEMT context. It would add to the robustness of the present study and further investigations might contribute to pedagogically oriented efforts to design effective teaching and learning tasks enabling opportunities for test-takers to enhance their situational alignment between the input text and their written production in SCWT.

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