BRITISH COUNCIL

University of HUDDERSFIELD
Inspiring global professionals

The Effects of Using Rhetorical Structure Theory in Facilitating Global Coherence in Written Performance of L2 Writers

by Van Thang Nguyen

British Council's Master's Dissertation Awards 2022

Commendation

TITLE

The Effects of Using Rhetorical Structure Theory in Facilitating Global Coherence in Written Performance of L2 Writers

ABSTRACT

This case study research aims at investigating how metacognitive training based on Rhetorical Structure Theory impacts the establishment of global coherence in students' writings. Following a pretest-posttest design with a mixed-method approach, 15 essays were analyzed in accordance with the four constraints of Rhetorical Structure Theory and a specifically designed scoring scheme. Results of this study show that before metacognitive training, there were five types of errors that undermine the degree of global coherence in students' writings, including incoherence between thesis statement and body part, incoherence between topic sentence and supporting sentences, incoherence between conclusion and body part, incorrect place of background and incorrect place of topic sentence. However, results also highlight that there is a positive correlation between metacognitive training and the establishment of global coherence as attested by the lower number and frequency of coherence errors in the two posttests compared to the pretest. Areas of improvement found in this study were the inclusion of background information, the inclusion of topic sentence, the coherence between thesis statement and body part and the coherence between topic sentences and supporting sentences. Notably, global coherence was better established in posttest 2 essays than posttest 1. These findings corroborate results of other studies regarding the positive effects of metacognitive training. They also underscore the potential implementation of RST in writing lessons to facilitate students' writing proficiency.

Key word: Global coherence, Metacognitive training, Rhetorical Structure Theory

TABLE OF CONTENTS

LISTS OF TABLES, FIGURES AND ABBREVIATIONS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

RST: Rhetorical Structure Theory

LIST OF APPENDICES

Page

CHAPTER 1: INTRODUCTION

Introduction

This chapter concerns the rationale for the study, its context as well as its aims and presents the four research questions. Finally, the organization of the dissertation is outlined for guiding the readers.

1.1. Rationale

One notable point reiterated in the literature is that coherence in writing is a challenging aspect. A great many studies have highlighted that writers, including students, are confronted with the daunting task of producing a coherent text to convey their ideas (Gernsbacher & Givón, 1995; Traxler & Gernsbacher, 1995; Concha & Paratore, 2010). Particularly, Jones (2007) who explored incoherence in academic writing, argued that "a single overwhelming challenge confronts the majority of students is an inability to construct a coherent argument in response to a given question" (p. 125), and emphasized that this is notably problematic for L2 students. Despite this, much research has underscored the lack of attention to global coherence in both teaching and feedback practices. Specifically, Teng (2019b) asserts that the conventional writing lesson mainly involves "diagraming sentences, learning specific grammar rules" (p. 436). Alfalagg (2020) also noted that teachers usually provide unfocused or surface-level feedback, such as morphosyntactic features or linking devices. Furthermore, revisions made by students are also predominantly concerned with this level (Brown, 2014). This tendency sometimes leads to "pseudo-coherence", i.e., the non-connectedness of a text despite the use of cohesive devices (Wang & Guo, 2014, p. 463) since the use of cohesive devices do not necessarily ensure coherence. Instead, it depends more on reader's meaning-making or interpretation (Celce-Murcia, 2001; Jones, 2007, Wang & Guo, 2014). This speaks to the need for more attention to relevance between parts of a writing in teaching. Also, in order for feedback on global coherence to be focused and effective, teacher and students should share a common knowledge about global coherence. This calls for an intervention that systematizes knowledge in this aspect and facilitates a systematic feedback-giving mechanism, which is the areas with which this research is concerned.

In the literature, the effects of metacognitive intervention on L2 learning have been extensively investigated (Colognesi et al., 2020). However, some research has underlined the lack of focus on L2 young learners though they constitute a large proportion of L2 learners (Tsiriotakis et al., 2020). Furthermore, to the best of my knowledge, research on metacognitive intervention in writing has produced few results on global coherence. The only study on metacognitive intervention related to this aspect was by Briesmaster and Etchegaray (2017), which investigated metacognition-based intervention on coherence and cohesion and found

significant improvement in logical idea organization and sentence sequencing. However, in this study, the focus was on local coherence and coherence with only a limited section dedicated to global coherence. It is these problems and gaps that justify the necessity to conduct the present study.

1.2. Context

The present study involves the participation of five ten-graders. All of them are non-English majors aged 16 at a public high school in Vietnam. In the light of their English scores at school, these students' level of proficiency is estimated to be B1 according to CEFR framework. In this study, they were introduced how to establish global coherence in a piece of writing through metacognitive training and the effects of this method were examined. All phases of the present study were conducted online. The teaching session, which took about 15 hours and spanned 2 weeks, took place via Zoom software and all writings were composed on Google Docs.

1.3. Aims and Objectives

This research is conducted to identify the effects of training L2 learners on global coherence. It sets out to see whether a metacognitive intervention based on Rhetorical Structure Theory facilitates L2 learners' ability to establish global coherence in their essays and revise this aspect.

1.4. Research Questions

The overarching research question of this study is:

- How does metacognitive training using Rhetorical Structure Theory affect the establishment of global coherence in students' writing?

Four specific research questions are:

1. How well are global coherence relations established in L2 learners' essays before metacognitive intervention?
2. How well are global coherence relations established in L2 learners' essays after metacognitive intervention?
3. Is there any improvement in global coherence in students' writing as rated by raters?
4. What aspects of global coherence have improved, if any, across essays written before and after the intervention?

1.5. Significance of the Study

On a personal level, the results of this research project can hopefully give the researcher – an L2 teacher a deeper insight into RST as a potential tool for facilitating students' proficiency in

L2 writing by instructing them to produce coherent discourse. This study may also serve as a source of reference for other teachers to apply this method to achieve the same goal. Lastly, notwithstanding its limited generalization, this dissertation is hoped to shed light on the effects of metacognitive training on writing quality of students and fulfil the lacuna regarding the correlation between metacognitive training and global coherence in the current body of literature.

1.6. Organization of the Study

This research project includes five chapters, the purpose of which is as follows:

Chapter 1 – Introduction concerns information on the context, rationale, aims, research questions, significance and organization of the paper.

Chapter 2 – Literature Review presents the background of the studies with theoretical framework and the review of previous research on the topic under investigation.

Chapter 3 – Methodology details the participants, data collection and data analysis procedures, positionality and ethical issues.

Chapter 4 – Results and Discussion presents the findings derived from analyzing the data and also the discussion on the topic.

Chapter 5 – Conclusion summaries the whole study, highlights significant findings, proposes recommendations, delineates limitations and suggestions for further studies.

This chapter – Introduction has covered the rationale of the present research, its context and aims, as well as research questions. In the next chapter, theoretical framework and review of relevant previous studies will be presented.

CHAPTER 2: LITERATURE REVIEW

Introduction

This chapter aims to present the conceptual framework for the study with the definition of key concepts, including writing, metacognition, metacognitive intervention, oral feedback, coherence and global coherence as well as Rhetorical Structure Theory. Prior studies are also reviewed to offer a view into the background of the research and highlight the rationale for conducting the present study.

2.1. The Writing Process

Writing is a productive language skill which concerns the formation of letters or characters to communicate thoughts (Hyland, 2004, in Briesmaster & Etchegaray, 2017). Compared to L1 writing, Schoonen et al. (2003) asserted that L2 writing is considered significantly more challenging given that it necessitates the deployment and integration of many mental processes that may not be sufficiently developed in L2 learners. In the realm of writing research, there have been manifold attempts to represent these component processes, for example Flower and Hayes' (1980) cognitive processes of writing model and Chenoweth and Hayes' (2001) model of written language production. Among these, that of Chenoweth and Hayes (2001) is deemed as a "comprehensive description of sub-processes involved in writing" (Wang & Han, 2017, p. 524); therefore, it is adopted in the present study (See Figure 2.1).

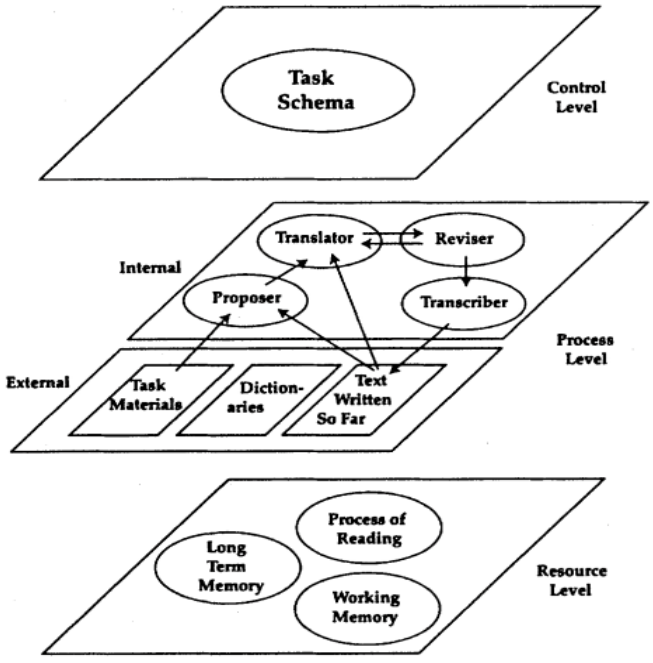

Figure 2.1: Chenoweth and Hayes' (2001) model of written language production

As can be seen from Figure 2.1, the writing process includes three levels, namely resource level, process level, and control level.

The resource level is comprised of cognitive elements, namely working memory, long term memory, and process of reading. According to Chenoweth and Hayes (2001), these internal memories and processes for general purposes can be deployed by other processes at the upper levels. For example, metacognitive control stored in working memory can be deployed by task schema to monitor all the processes involved in writing (Wang & Han, 2017).

The second level named process level is made up of internal and external sub-levels. The former includes a proposer, a translator, a transcriber, and a reviser. The proposer is responsible for generating ideas to be arranged into the written discourse while the translator turns "pre-linguistic ideas into strings of language with appropriate word order and grammar" (Chenoweth & Hayes, 2001, p. 84). The third component, namely reviser is mostly concerned with the process of revision which involves evaluating, modifying and improving these strings of language, which are then coded into hand-written form or computer-generated scripts by the transcriber. The second sub-level comprises the audience, the text that the writer has produced so far and the task materials.

The third level – the control level is the task schema. This level "governs the interactions among the processes" (Chenoweth & Hayes, 2001, p. 84). The pattern of interactions is represented by the arrows in Figure 2.1. Specifically, in the first stage, the task goal in task materials and the text written so far will influence the proposer, which in turn produces ideas. These ideas are then transferred to the translator to be processed and evaluated by the reviser. If the output is evaluated to be acceptable, it is subsequently turned into written form by the transcriber; otherwise, it will be re-processed by the proposer and the translator anew to generate alternative options for modification.

In their article, Chenoweth and Hayes (2001) emphatically noted that the process is not "one-directional" (p. 85). For example, in many cases, the reviser is activated and interferes with the processes undertaken by the proposer, translator and transcriber to ensure a quality output. The complex interactions between these processes "compete for limited executive attention and storage in working memory" (Kellogg & Whiteford, 2009, p. 255) and instigates strain on the limited capacity of working memory. This might lead to some aspects of writing being insufficiently heeded, thereby constraining writing proficiency. For example, Spivey (1990, cited in Wischgoll, 2016) listed coherently sequencing ideas as one of the aspects that the writer often fails to give due attention during composition process. In order to relieve the burden on working memory, L2 writers are required to resort to any available knowledge or

skill; however, according to Kellogg (2008), this is only possible provided that such knowledge or skill has become “accessible, either by rapidly retrieving it from long-term memory or by actively maintaining it in short-term working memory” (p. 2). Graham and Perin (2007) and Kellogg and Whiteford (2009) claimed that one way to get round this problem is instruction activities. Among the various instruction methods, many studies, for example Graham et al. (2012), Colognesi et al. (2020) and Zhao and Liao (2021) note that metacognitive training is a promising practice that facilitates learning in general and writing in particular. The theory of metacognition and effects of metacognitive training will be discussed in the following sections.

2.2. Metacognition and its Effects on L2 Writing

Metacognition is initially defined by Flavell (1976, p. 232, in Öz, 2016) as “one's knowledge concerning one’s own cognitive processes and products or anything related to them”. Extending this definition, Wenden (1991) views metacognition also as a process whereby a learner actively and dynamically controls his or her own cognition. These definitions manage to capture the essence of metacognition that a metacognitive L2 learner is aware of his own cognition and able to control as well as monitor it during the process of dealing with learning tasks.

Metacognition involves two components, namely metacognitive knowledge and metacognitive strategy (Schraw et al., 2006; Raoofi et al., 2013). The former concerns knowledge and cognitive processes involved in learning activities whilst the latter refers to the ability in monitoring and regulating those aspects. Metacognitive knowledge is further divided into declarative knowledge (i.e., knowledge about things, for example linguistic aptitude or motivation and task knowledge), procedural knowledge (i.e., knowledge of how to successfully accomplish a task) and conditional knowledge (i.e., knowledge of when and why to utilize particular strategies in handling a task). Meanwhile, metacognitive strategy is categorized into planning, monitoring and evaluating (Shaw, 1998, in Teng, 2019). The first component has to do with the selection of pertinent strategies and sufficient allocation of resources to deal with a task. Monitoring, meanwhile, refers to the way writers employ those selected strategies during task performance and evaluating involves writers’ self-assessment of their self-regulation or the final products.

Recognizing the role of metacognition in the writing process, many studies, for example Teng (2016, 2019a, 2019b), have highlighted the need to combine metacognition in dealing with a writing task. The following framework by Hayes and Flower (1980) can demonstrate metacognition’s role in writing process:

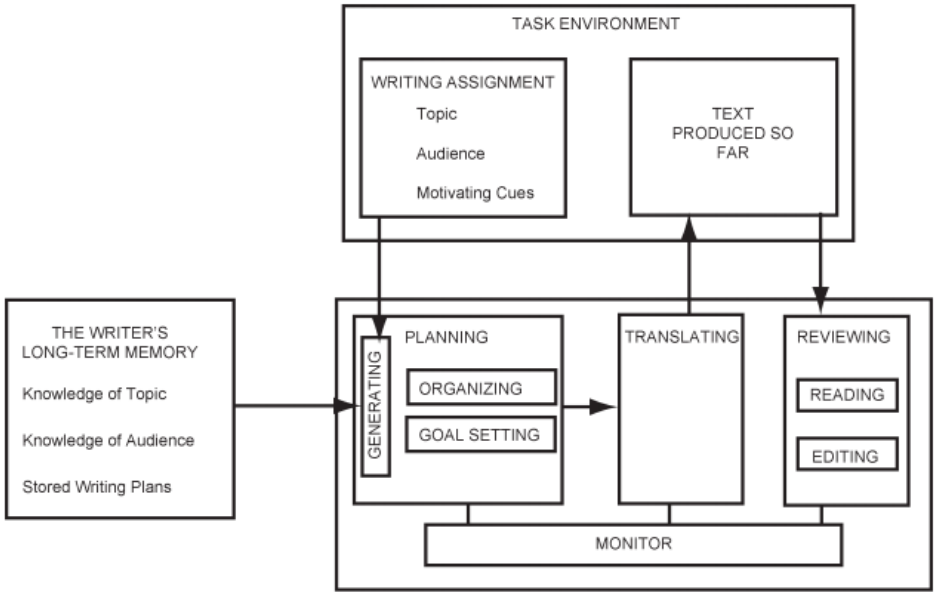

Figure 2.2: Hayes and Flower's (1980) process model of writing

As can be seen from Figure 2.2, metacognitive knowledge is located in long-term memory of resource level and is deployed by different components in process level. For instance, metacognitive knowledge of topic and audience can be called on by proposer to generate and organize ideas. Meanwhile, the three components of metacognitive strategy, namely planning, monitoring and evaluating are stored in the working memory that govern all the processes in writing (Wang & Han, 2017). Among the three components, planning and evaluating are closely associated with the proposer, translator, reviewer, transcriber at process level while monitoring corresponds with task schema at control level. Indeed, metacognition "pervades the writing process" (Lee & Mak, 2018, p. 1089).

The importance of metacognition in learning and writing has been given credit by many studies (Graham & Perin, 2007; Graham et al., 2012; Haukås, 2018). For instance, Escorcia and Fenouillet (2011, in Piret et al., 2020) who used questionnaire and textual analysis of written compositions of students attributed the superior text quality of some students to the better deployment of metacognitive knowledge to generate and organize ideas as well as the better understanding and activation of appropriate strategies during writing process. In the same vein, Farahian and Avarzamani (2018) who compared metacognitive awareness between skilled and less-skilled EFL writers by adopting a validated questionnaire reported a positive correlation between higher declarative metacognitive awareness and writing quality. This claim concurs with that of Graham and Perin's (2007) meta-analysis of writing instruction for adolescent students. These two authors then went on to call for the adoption of metacognitive instruction to support L2 learners. In the literature, there are several studies reporting the role

of metacognitive instruction in facilitating L2 students' writing which will be discussed in the following section.

2.3. The Effects of Metacognitive Intervention on Writing

Panahandeh and Asl (2014) claimed that most studies on metacognitive training have produced positive results. This claim is corroborated by the meta-analysis by Graham et al. (2005) and the review study by Perry et al. (2019). Indeed, Graham et al. (2005) asserted that "the primary finding from this meta-analysis was that strategy instruction is effective in improving students' writing performance" (p. 204). The following part concerns itself with studies that have been conducted into the effects of metacognitive intervention on writing performance of L2 learners.

One area of growing interests solely focuses on metacognition of students as the result of explicit instructional activity organized by teachers. One such study is conducted by Lv and Chen (2010). They conducted a study into the impact of metacognitive strategies among students in a vocational college. Participants in the experimental group received metacognitive questions and training aimed to promote their awareness and understanding of the strategies in writing as well as methods to optimize these strategies. Results derived from the analyses of pretest and posttests speak to the positive impact of metacognitive training on writing proficiency in general. Targeting a different group of participants at elementary school, Tsiriotakis et al. (2020) examined the impact of a writing intervention program using a quasi-experimental pre-posttest design. The experimental group received explicit instruction on various aspects of narrative writing such as topic selection or idea organization whereas the control group followed the traditional program. Results of this study underscore the positive effects of such metacognitive intervention in terms of text quality and length as opposed to virtually no changes in the control group.

Another major strand of research sees writing as a situated activity in which metacognition can be effectively activated if students work in groups (Graham et al., 2005). Some studies have investigated the impact of collaborative tasks and talk on metacognitive knowledge and strategy, for example Larkin (2009). It emerged from content analysis of students' texts and observation data that collaboration between students is likely to lead to higher metacognitive behavior and improvement in written composition. Extending the scope of investigation in this line of research by comparing three groups of students under three different conditions, Teng (2016) aimed to identify the immediate and delayed effects of metacognitive instructions on students' English writing. The three conditions in this study were collaborative learning with metacognitive instruction, only collaborative learning and non-treatment control group. The

instruments include pre- and post-writing tests, delayed writing test, metacognition scale and interview. Data analysis yields significant differences between the two experimental groups and the control groups, which lends support to the effects of collaborative learning similar to Larkin (2009). It is also noteworthy that between the two experimental groups, the one which received metacognitive instruction, including metacognitive knowledge and control outperformed the other, especially in terms of self-regulation of metacognition.

It is manifest that the above studies fail to specify particular aspects that register progress, except Tsiriotakis et al. (2020) which explicitly reports gains in text quality and length. However, text quality can be a generic term without specifying detailed categories. Such a deficiency necessitates studies which can pinpoint the distinct aspects of improvement thanks to metacognitive training. Nguyen and Gu (2013) filled in this lacuna by adopting an intervention study with an experimental and two control groups to investigate the effects of strategy-based instruction in enhancing learner autonomy among university students. Using the same instruments as Teng (2016), its results reveal that students tended to focus more on specific aspects to achieve coherence, one of which is cohesive device. However, this study notes that such focus on local level was at the expense of the global ones such as idea development and organization. Colognesia et al. (2020), on the other hand, compared teaching practices with or without the incorporation of metacognition. Participants in this study were required to produce book reviews and revise them. All participants received general writing instruction, knowledge scaffolding and peer feedback while only the experimental group were asked metacognitive questions before, during and after the task. Results are in tune with previous studies in that students in experimental group show more significant improvement in writing proficiency, idea development, textual consistency, vocabulary, spelling and text presentation which are ascribed to the instructional activities they received.

As can be seen, the previous studies investigate the effects of metacognitive training on writing quality in general. Although some studies did allude to specific areas of improvement, none of them actually zero in on coherence specifically. The only study on metacognitive intervention related to this aspect was that by Briesmaster and Etchegaray (2017). In this study, 19 eight-graders participated in an intervention session using metacognitive strategies. Quantitative analysis shows statistically significant differences between pretest and posttest in terms of cohesion and coherence. Particularly, linking devices and logical idea organization were reported to register the most noticeable improvement with the latter category achieving the maximum score. However, pretest and posttests in this study were in the form of paragraph rather than the whole essay. Skoufaki (2020) asserted that the limited number of words in a paragraph might make it difficult to analyze coherence compared to longer texts. Also, this

study only reports findings derived from quantitative data without any qualitative textual analysis to illustrate and triangulate the subjective scoring, leading to low reliability of the results, as noted by Iruskieta et al. (2014).

2.4. Impact of Oral Feedback Delivered during Writing Conferences on Students' L2 Writing

In the literature, the positive impact of oral feedback on writing has been extensively reported. Firstly, it is conducive to the noticing of problematic aspects in students' writing as Pacello (2018) noted that participants are able to notice issues that "they had not known about or had overlooked" (p. 193). Shintani (2015) who examined asynchronous and synchronous feedback on writing reported that both types of feedback are conducive to students' noticing the gaps, especially grammatical features such as hypothetical sentences. Secondly, feedback triggers self-regulation and error revisions, according to Ferris and Hedgcock (1998, in Çepni, 2016). Elola and Oskoz (2016) who investigated the influence of computer-mediated oral and written feedback found that oral mode assists self-regulation and revisions more than written mode. Notably, this study also reported that revisions on a global level are made more through this feedback form. Meanwhile, comparing explicit and graduated oral feedback, Çepni (2016) reported a higher frequency of error self-correction in Graduated Feedback Group compared to Explicit Feedback Group. She ascribed this result to the fact that as students in Graduated Feedback Group were asked metacognitive questions such as "What's the problem here?" or "How should you have done?", they were encouraged to actively pinpoint and modify errors. This result lends support to Erlam et al. (2013), Lantolf and Poehner (2004) and Lee and Mak (2018).

As can be seen, in the previous section, feedback given by teachers and revisions made by students is mostly to do with morphosyntactic errors. In contrast, coherence and cohesion are aspects that the majority of research in both metacognitive instruction and feedback fail to give due attention, except for Elola and Oskoz (2016). These two aspects will be discussed in the subsequent section.

2.5. Coherence and Global Coherence

Coherence is viewed as a basic component of a written discourse which refers to the relatedness between sentences or larger chunks of discourse (Wang, Harrington & White, 2012) and can be categorized into local and global coherence. The former is defined as the transitions between sentences whereas the latter refers to the degree of connectedness between larger segments to fit into the discourse's main theme. Agar and Hobbs (1982, p. 7, cited in Adornetti, 2015) proposed a question characterizing local coherence as "Given what I

just said, what can I say that is related to it?" while the question "Given the overall goals I am trying to accomplish what can I say next that will serve them?" can be asked when it comes to global coherence. Hinkel (2003) claimed that in order to achieve global coherence, parts of a discourse should revolve around the central message and be logically arranged. In accordance with this definition, Marini et al. (2005) defined global coherence errors as those that involve an utterance being tangential or misinterpreted within the overall theme. Several theories and frameworks to identify coherence in a text have been put forward, for example Relevance Theory (Pateman et al., 1986), Given-to-New principle (Halliday & Matthiessen, 2013) or Centering Theory (Grosz et al., 1995). However, the framework that is of most relevance to the present research project is Rhetorical Structure Theory advanced by Mann and Thompson (1988).

2.6. Rhetorical Structure Theory

Rhetorical Structure Theory (henceforth RST) is a linguistic approach to text organization proposed by Mann and Thompson (1988) that aims to reconstruct the internal structure of a coherent text. In this theory, the most fundamental concept is rhetorical relation, which refers to the connection between two elementary discourse units (EDUs) – minimal building blocks of discourse roughly corresponding to clauses (Mann & Thompson, 1988). Within each relation, one EDU termed "nucleus" underscores the purpose of the writer whereas the other, termed "satellite", provides supplementary information. Taboada and Mann (2006a) asserted that nucleus is the pre-requisite element without which text coherence and writer's intention will not surface; meanwhile, the deletion of the satellite will not greatly affect the original meaning of the text. Between the nucleus and satellite exists a particular kind of relation and so far, 32 relations have been identified (Rhetorical Structure Theory, 2005) – an extension of the original 24 relations in Mann and Thompson (1988). The reconstruction of rhetorical relations constitutes a tree-like structure which in turn represents text coherence.

The rationale for implementing RST in the present study is manifold. According to the review studies by Taboada and Mann (2006a, 2006b) and Sum (2004), RST offers a more comprehensive representation of relations than other theories. Also, van Dijk and Kintsch (1983, in Ahmadi & Parhizgar, 2017) claimed that this theory addresses "a global view of text" (p. 13). Specifically, certain RST relations denote the role of one part with respect to the other, thus demonstrating the relevance between segments of the whole text. Lastly, the reconstruction of RST trees lends itself to the identification of coherence breaks since any non-sequitur can be made observable, for example in the form of dangling units. This feature corresponds to this study's aim to investigate global coherence in students' writings, which inevitably involves identifying areas of incoherence.

RST has been extensively used in various fields such as text generation, summarization or cross-linguistics (Taboada & Mann, 2006a; Azar, 1999). In the area of writing, the focus has been on text analysis. For example, Skoufaki (2009) aimed to apply RST to identify errors in L2 learners and compared her RST-based analysis to the analysis by an automated writing evaluation software. Numerous coherence problems emerged from the RST-based analysis, for example the lack of topic sentence or irrelevance between content and the overall theme. As a replication of this study, Ahmadi and Parhizgar (2017) analyzed 64 essays of descriptive and argumentative genres. Using a mixed-method approach, the authors concluded that there are eight types of errors in participants' essays, namely irrelevant content, violation of completedness, violation of connectedness, incorrect place, incorrect relation, crossed dependency, scattered units, and topic.

As can be seen, RST is a versatile framework that is used to analyze relations in a text on a holistic scale. Apart from its application in text generation or summarization, there have been preliminary attempts to adopt RST as the framework to analyze and detect coherence errors in students' writings.

The above discussion emphatically highlights the impacts of metacognitive instruction on writing proficiency. However, the foregoing review also highlights certain lacunae in the current literature. Firstly, both feedback from teachers and revisions by students are also found to be unfocused and center around local-level features. Further, an undue focus has to date been on the analysis of the impact of metacognitive instruction on writing quality in general without much allusion to global coherence. Another notable point is that notwithstanding the positive correlation between metacognitive instruction on student writing (Graham & Perin, 2007; Panahandeh & Asl, 2014), Graham (2005) in his meta-analysis study posits that this method is not implemented in classroom settings as widely as others, which concurs with other studies (for example Colognesi et al., 2020). He went on to suggest that this can be incorporated into teaching practice to enhance students' writing proficiency and also call for additional research into the impact of metacognitive intervention. The present study is conducted in response to this call. I would argue that RST is a potential framework based on which a metacognitive intervention program can be developed to facilitate L2 learners' metacognition to improve the degree of global coherence in their writing.

The subsequent section aims to explicate how the intervention program was implemented and data collection as well as analysis procedures.

CHAPTER 3: METHODOLOGY

Introduction

This chapter concerns methodological approach to the present study. It deals with research design, data collection and analysis methods, followed by positionality statement and ethical considerations.

3.1. Case Study

In order to address the four research questions, this study employed a mixed-method approach and data was collected through a case study method.

In this study, five participants went through a metacognitive training in which they were instructed in opinion essay genre and the concept of coherence in writing. Also, they were given an RST-based explicit training on identifying and applying coherence relations in their own essays.

Case study method is appropriate for the present research project since with five participants, it afforded an opportunity to investigate coherence in students' writing in an in-depth manner rather than surface data from other methodologies such as experimental score comparison studies (Denscombe, 2014; Duff, 2014; Yin, 2017). By analyzing essays before and after intervention based on RST trees, the researcher could obtain a wealth of data which revealed how individual student responded to the training sessions. Thanks to this methodology, the establishment of global coherence and related problems as well as the revisions thereof in students' essays can be identified. The comparison of such data enabled the researcher to identify whether students could improve the establishment of global coherence in their writing or not.

Nevertheless, there were note-worthy limitations of this methodology, first of which was limited generalizability due to the low number and lack of representativeness of cases (Griffin, 2004; Denscombe, 2014). Also, some research has emphasized the lack of systematic procedures in case-study research. These matters were handled in the present study by dint of a carefully designed metacognitive session, a fixed and systematic undertaking of data collection and analysis procedures as well as inter-rater reliability measures which will be delineated in the following sections.

3.2. Methods

In this case-study research, a mixed-method approach was used with qualitative approach being the main one. In the present study, qualitative analyses were conducted to identify the establishment of global coherence in students' essays written before and after the intervention.

Specifically, RST trees that represent the structure of students' essays were drawn and areas of errors related to global coherence as demonstrated in the trees were identified and compared to determine the level of global coherence. Such differences directly addressed the research aims of investigating whether metacognitive training can enhance coherence in students' writings. On the other hand, quantitative approach was used to address the third research question. Specifically, a rating scale especially developed for this research project was used and scorings of 15 essays by 20 raters were collected to determine whether there was any significant difference in the establishment of global coherence across essays (Refer to Appendix 1). This approach was also used to counteract the "subjective judgment" associated with the reconstruction of rhetorical relations (Mann & Thompson, 1992, p. 52). In short, the data derived from a mixed-method approach is "complementary" and "provides a fuller and more complete picture of the thing that is being studied" (Denscombe, 2014, p. 147).

3.3. Procedure

The study is composed of three main phases, including pretest, metacognitive training and posttest.

3.3.1. Pretest

Before the metacognitive training, the students wrote a pretest essay to the topic *"Travelling is a better way for all people to explore a foreign country than reading. Do you agree or disagree with this statement?"*. The participants composed the essay in 60 minutes on Google Docs platform under the researcher's supervision.

3.3.2. Metacognitive Training

Metacognitive training procedure consisted of two main stages, namely training on general writing and on RST relations.

The first phase, which comprised one lesson and one practice session, aimed to equip students with knowledge of opinion essay and initially raise their awareness of coherence relations. Participants were first introduced to opinion genre and after analyzing samples with discussion questions about functions of each essay part, they were provided with the basic essay structure. This preceded the stage of students making an outline of an essay based on the structure and writing a practice essay under the same condition as the pretest, after which there was a feedback session focusing primarily on essay structure and relations between its parts.

The second phase concerns the introduction of coherence concept and RST relations. However, in this study, RST concept and relations were adapted to be relevant to this study, which will be discussed in Section 3.5. This was followed by a practice session for students to

identify relations between units in short texts and the whole essay. Subsequently, the participants were engaged in a writing practice session, followed by a feedback session for students to identify areas of incoherence in their essays. In this feedback session, students were provided with graduated feedback in accordance with the guidelines by Aljaafreh and Lantolf (1994) (Refer to Appendix 3).

3.3.3. Posttests

There were two posttests in this study. The first one was the revised version of the pretest (henceforth posttest 1) and another one was an independent essay (henceforth posttest 2) to the topic: *"Some people think that it is better for children to live in the city than in the countryside. What is your opinion?".* They were conducted under the same condition as the pretest.

3.4. Analytical Framework

This study implemented Rhetorical Structure Theory as the analytical framework in metacognitive training and qualitative analysis. However, for these purposes, this study chose among the 32 already identified relations and adapted them. The adaptations involved (1) putting several relations with similar features under one relation and (2) simplifying the names of some relations. The adaptation process yielded a list of 13 relations operationalized in this study. For further details about these 13 relations as well as the original relations from which they are adapted, refer to Appendix 2.

The first rationale for this adaptation is the limited time. Specifically, the metacognitive training only lasted 15 hours and covered both general writing strategies and RST relations; therefore, it would have been a formidable task to introduce the full range of relations, including their meanings, examples as well as practice activities. Furthermore, considering students' proficiency level (B1), understanding this full list of relations within a short time frame is synonymous with an enormous amount of pressure. This could have been exacerbated by the subtle differences between relations in one group. For example, though *evidence*, *explanation-argumentative* and *reason* relations share the core feature of the Satellite explaining and supporting the Nucleus, there are minor differences among them regarding the agent of action (i.e., whether it is an animate object) or the nature of information (i.e., for *evidence* relation, the satellite is usually statistics compared to action or state in *reason* relation). Without proper understanding, students may be confused during practice and writing sessions and this can be counter-productive. Accordingly, putting relations with the same essence under a simplified umbrella term would ensure that students can grasp the core meaning of each relation group.

3.5. Data Collection

The data for qualitative and quantitative analysis consists of 15 opinion essays in total: five pretest essays, five posttest 1 essays and five posttest 2 essays. Each of them was saved in a separate file and named in this format: Pre-/Post-1/Post-2 + [Pseudonym of student], for example Pre-E is the pretest essay written by student E.

3.6. Data Analysis

3.6.1. RST Data Analysis

RST Data analysis encompassed segmentation, structuring, annotation, RST-based qualitative analysis and score data analysis.

3.6.2. Segmentation and Structuring

Segmentation process involved dividing each essay into EDUs using RSTTool. In this study, the segmentation method presented in Carlson and Marcu's (2001) manual was adopted. Following this, the researcher connected two units by clicking and dragging one unit to another. RSTTool automatically assigns the starting unit as the satellite and the destination unit as the nucleus. Also, by adding spans, the researcher could create a hierarchical relation between units, with the higher nodes being the overall idea while the lower ones are component ideas.

3.6.3. Annotation

Immediately after establishing the link between the satellite and the nucleus, the researcher assigned the relation in accordance with the 13 relations used in teaching session to ensure correspondence between metacognitive training and data analysis. This process would yield an RST tree for each essay.

3.6.4. Reliability of RST Segmentation and Annotation

Since RST annotation invariably entails a certain degree of subjectivity (Kong et al., 2018), this study recruited another annotator to verify the segmentation and annotation processes. The annotator is a Master student in TESOL and has an in-depth knowledge of English language. First, she was introduced to RST concept and principles, list of relations and discourse-tagging manual. The annotator and the researcher then independently practiced segmenting and annotating different texts, and any differences were discussed and resolved.

Subsequently, the annotator started to independently segment and annotate students' essays by adhering to the procedure outlined in Sections 6.2.1-6.2.3. Once this procedure had been completed, two versions were compared to calculate inter-rater consistency in terms of (1) segmentation, i.e., whether a segment functions as a unit and (2) annotation, i.e., which

relation holds between two units in the text. The first measure of segmentation agreement was 87% while the percentage of annotation agreement was 82%, indicating a high level of reliability (Kong et al., 2018). Any differences in the segmentation and annotation results were then discussed and an agreement was made on the finalized version of the RST trees.

3.6.5. RST-based Qualitative Analysis

Each RST tree structure was qualitatively analyzed based on the three constraints of RST, namely completedness (one schema application contains the entire text), connectedness (each span, except for the span that contains the entire text, is either a minimal unit or a constituent of another schema application), uniqueness (each schema application contains a different set of text spans), and adjacency (the spans of each schema application constitute one contiguous text span). Also, since investigating coherence in writing necessarily involves detecting coherence breaks, this study also drew on the list of coherence errors by Ahmadi and Parhizgar (2017) as well as violations of three constraints by Skoufaki (2020) (See Appendix 4 and Appendix 5). Qualitative analysis of pretest and posttests yielded the identification of five types of errors related to global coherence, which are summarized in the following table:

Table 3.1.: Types and definitions of coherence error

Type of error	Constraint violation	Definition
Incoherence between thesis statement and body part	Completedness and Connectedness	The idea expressed in thesis statement is not related to those discussed in body paragraphs.
Incoherence between topic sentence and supporting sentences	Completedness and Connectedness	The idea expressed in topic sentence is not related to those discussed in the following sentences.
Incoherence between conclusion and body part	Completedness and Connectedness	The idea expressed in the conclusion is not related to those discussed in the body paragraph.
Incorrect place of Background	Completedness	A sentence providing background information is not found at the beginning of the essay.
Incorrect place of Topic sentence	Completedness	A sentence outlining the main ideas to be elaborated is not found at the beginning of the paragraph.

As mentioned before, this categorization is partly based on the findings by Ahmadi and Parhizgar (2017) and Skoufaki (2020). However, in the present research, instead of classifying the errors under an umbrella term such as dangling units or incorrect place, the researcher further divided them into different subtypes such as “incoherence between thesis statement and body” or “incorrect place of topic sentence” that clearly denote areas of incoherence. This categorization would make it easier to identify which specific essay parts do not cohere with each other and better determine the degree of global coherence accordingly. Also, this would enable the researcher to identify specific areas that improved after metacognitive training.

It is noteworthy that five errors all fall under the constraints of connectedness and completedness. Though the violations of uniqueness and adjacency were also found, analysis shows that they all concern local level, which is not relevant to the concept of global coherence.

3.6.6. Data Analysis of Score Ratings

In order to triangulate results of qualitative analysis, this study also adopted quantitative scoring. Specifically, 20 English teachers were recruited to rate the essays using a five-point

scheme adapted from O'Brien (1995) (Refer to Appendix 1). The scheme is made up of eight criteria concerning relations between and within parts of the text. Specifically, the first two criteria deal with the relations in the introduction, followed by six criteria focusing on the relation in the body paragraphs. Among these six criteria, criteria 3-4 concern the relations between paragraphs as a whole to the thesis statement and to each other while criteria 5-7 refer to the relations within each paragraph. The last criterion has to do with the relation between conclusion and the rest of the essay.

Before the rating process, a briefing session and practice was organized to ensure that the raters correctly understood what each criterion refers to and what they were required to do. Any queries or disagreements were settled to make sure that all raters share a mutual understanding of the scheme criteria. Following this, the raters were required to rate the essays according to eight criteria. The ratings were then collected and paired samples *t*-tests were measured. Also, the raters were asked to indicate the places that they thought to be incoherent to complement the researcher's analysis.

Results of the RST-based qualitative analysis and coherence ratings were used to answer the four research questions as follows:

- The first research question was addressed by identifying and analyzing the rhetorical relations between parts of individual pretest essays.
- The same applied in answering the second research question with the data being posttest essays.
- The third research question was answered by calculating inter-rater reliability of the scorings by 20 raters using paired samples *t*-tests.
- The fourth research question was addressed by the comparison of RST maps and analytic scorings to identify the areas of changes that have been made across the pretest and posttest essays.

3.7. Positionality Statement

In this study, my dual roles as teacher and researcher as well as my assumptions of the positive impact of metacognitive intervention on global coherence might affect the objectivity of the results (Holmes, 2020). Also, analyses of global coherence in two writing versions might be colored by my theoretical and experiential background of the research topic.

In order to reduce subjectivity, systematic data analysis and feedback-giving frameworks were strictly followed. Also, to ensure results' reliability, apart from my own analysis, another annotator also reconstructed RST trees and 20 raters were recruited to score essays on

different criteria. These attempts notwithstanding, an element of subjectivity inevitably persists, especially in interpreting the realization of global coherence in students' writings.

3.8. Ethical Considerations

Participants were given the Participant Information Sheet specifying the study's purpose and procedures. Subsequently, they signed Participant Consent Form to indicate their voluntary participation. They were made aware that they could withdraw from the present study at their will. In order to guarantee participants' anonymity, pseudonyms were used and their information was treated with strict confidentiality. Also, students were reminded that the sessions were recorded and all audio tapes would by no means be disclosed to the public. Lastly, they were made aware that the teaching sessions were free of charge and involved no official scoring.

This chapter has so far provided an overview of the research design and methodology, data collection and analysis procedures. Also, positionality statement and ethical issues are also presented.

CHAPTER 4: RESULTS AND DISCUSSION

Introduction

This section reports the results derived from both qualitative and quantitative analyses of pretest and posttest essays. Firstly, results of qualitative analysis of pretest and posttest essays are presented in order to address the first and second research questions. Subsequently, results of paired samples *t*-tests will be shown in response to the third research question. Lastly, areas of improvement will be identified to answer the fourth research question. Accompanying the analysis are the illustrative RST diagrams in which areas of coherence problem are marked by red double brackets while areas of improvement are marked by green ones. However, due to the limited space of page layout, the font size of RST tree in this chapter is rather small; therefore, RST diagrams with a larger font size for ease of viewing are put in Appendix 6.

4.1. Results

After reconstructing RST trees and analyzing the relations between text spans, the researcher determined the degree of global coherence in pretest and posttest essays by identifying the instances that violate the four constraints in Rhetorical Structure Theory. The occurrence of these errors is a determinant of the degree of global coherence in a text since such violations represent ruptures or irrelevancy between segments of a text, leading to low degree of global coherence.

The following section presents results derived from qualitative analysis of pretest essays and posttest.

4.1.1. Research Question 1: How well are global coherence relations established in L2 learners' essays before metacognitive intervention?

Analyses of five pretest essays show that global coherence was not successfully established due to frequent instances of errors that violate connectedness and completedness constraints. The occurrence of these errors across all pretest essays means that certain parts of these essays do not cohere well with each other. Some were found to be more problematic in terms of global coherence than others due to the higher number of types and frequency of errors, for example Pre-C and E.

The following table summarizes the Types and frequencies of coherence error in each pretest essay.

Table 4.1: Types and frequencies of coherence error in pretest essays

	Pre-A	Pre-B	Pre-C	Pre-D	Pre-E
Incoherence between thesis statement and body part	1	1	1	3	2
Incoherence between topic sentence and supporting sentences	1	1	1	0	2
Incoherence between conclusion and body part	0	0	1	0	1
Incorrect place of background	1	1	1	0	1
Incorrect place of topic sentence	2	0	1	1	0

One of the most pronounced findings emerging from qualitative analysis is the occurrence of incoherence between segments across all essays. This error happens when there is one unit or scheme that does not fit into a schema application due to irrelevancy in terms of content. It violates the constraint of connectedness and completedness since any unit or scheme not belonging to another scheme application will be excluded from the overarching RST tree, thus coherence on a global scale is undermined. The analysis shows that the lack of coherence appears between thesis statement and body part, between topic sentence and supporting sentences as well as between the conclusion and body part. These three coherence problems combined account for the highest frequency of errors found in five pretest essays (15 out of 23 instances).

Among these three sub-categories, the one which affects global coherence in all essays is incoherence between thesis statement and body part. Since thesis statement functions as the orientation of the whole essay's content, any instances of irrelevancy between them may lead to weakly established global coherence, sometimes across the entire text.

Consider the following example taken from Pre-E:

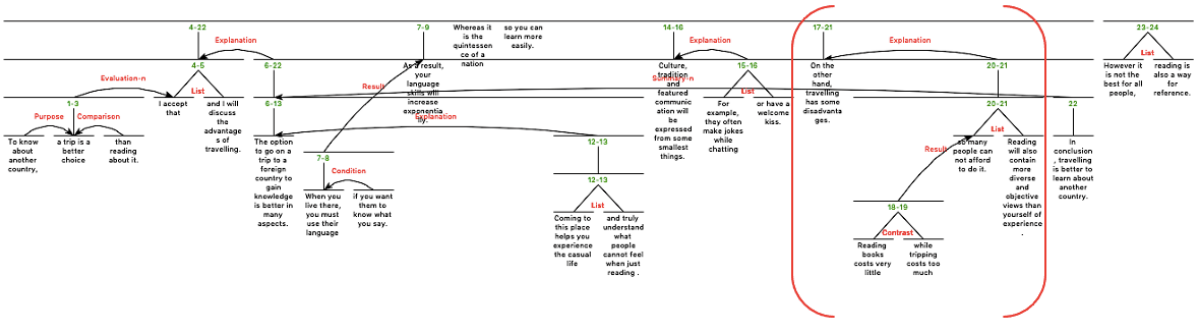

Figure 4.1: Incoherence between thesis statement and body part in Pre-E

As can be seen from the RST tree, Units 17-21 is disconnected from the overall scheme application, which is indicative of content irrelevancy. Specifically, in thesis statement, the student expressed her agreement that travelling fares better than reading to explore the world and intention to discuss the advantages of the former method. However, in Units 17-21, disadvantages of this method were discussed. Such a mismatch between thesis statement and body paragraph 2 renders this whole paragraph irrelevant and there exists no *explanation* relation between them, thus seriously undermining global coherence of a major part of the essay. The same problem applies to other pretest essays, implying that global coherence between thesis statement and body paragraphs is weakly established.

Global coherence within each paragraph is also problematic in all pretest essays except for Pre-D. In these essays, students cannot form a relation between topic sentences and the remaining segments of the paragraph, as can be seen in Pre-C.

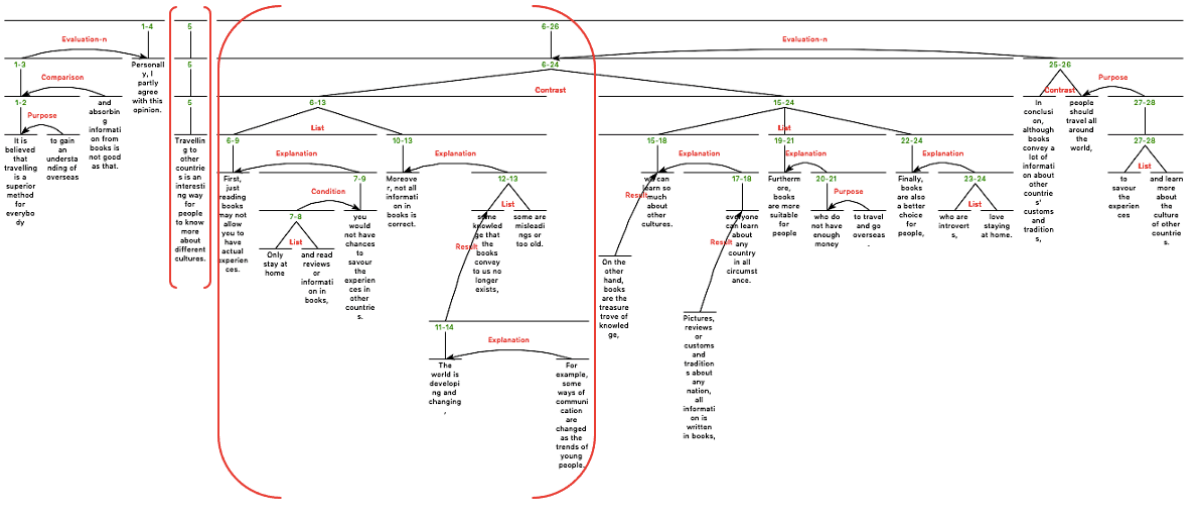

Figure 4.2: Incoherence between topic sentence and supporting sentences in Pre-C

RST tree of Pre-C exhibits the dangling structure between Unit 5 and Units 6-13. Unit 5 refers to travelling as “an interesting way for people to know more about different cultures.” Topic sentence is the “explicit statement of an idea” that is elaborated and supported by the

remaining section in the paragraph (Liu & Fourneaux, 2014, p.80). Therefore, in order for the above paragraph to be globally coherent, the following Units 6-14 are supposed to explain why travelling is an interesting method. However, these sentences delineate the drawbacks of reading books without any reference to travelling. Such an incongruity in content means that there exists no *explanation* relation between Unit 5 and the span of Unit 6-13. In other words, a sense of coherence is non-existent, affecting global coherence of the whole paragraph.

Another finding emerging from the analysis is that global coherence between the conclusion and body part is not well established, for example in Pre-B, C and E. The following diagram is the RST tree of Pre-B:

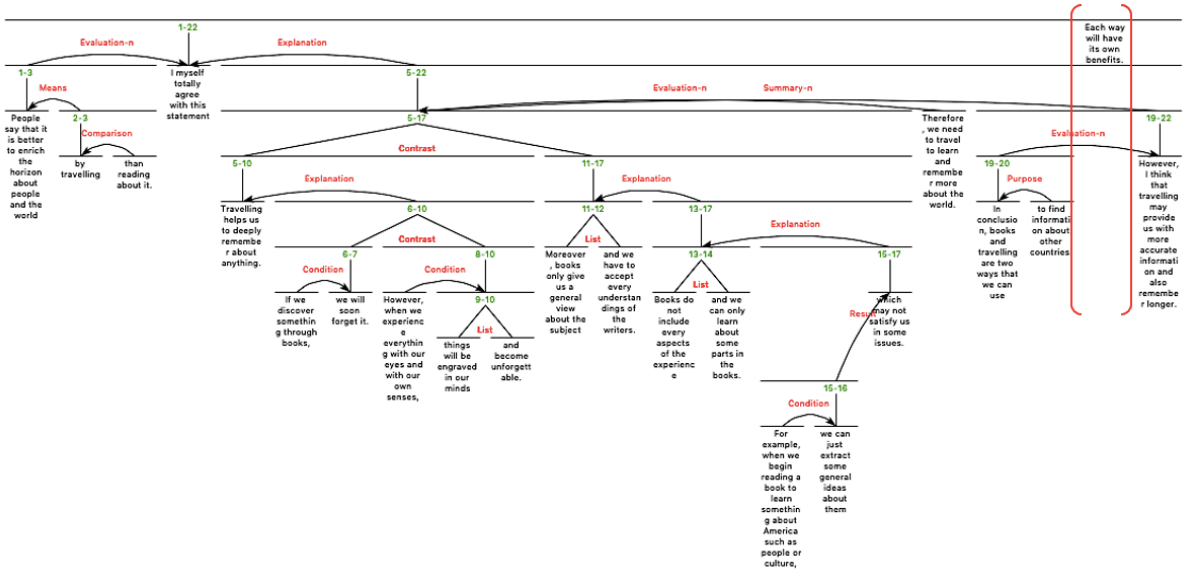

Figure 4.3: Incoherence between conclusion and body part in Pre-B

The representation of RST tree illustrates the disconnection of the Unit 21 to the whole essay. In the body paragraph, the student discussed the advantages of travelling as well as the shortcomings of books. However, Unit 21 – “Each way will have its own benefits” is irrelevant to the second body paragraph in which this student only referred to the disadvantages of books. As can be seen, this irrelevancy compromises the connectedness between these two segments.

Another type of error is related to background in the introduction. Firstly, most pretest essays except for Pre-D were found to lack background information at the beginning. Instead, they either directly introduced the argument or gave the student’s view without providing any background information beforehand, as can be illustrated by the following example of Pre-A:

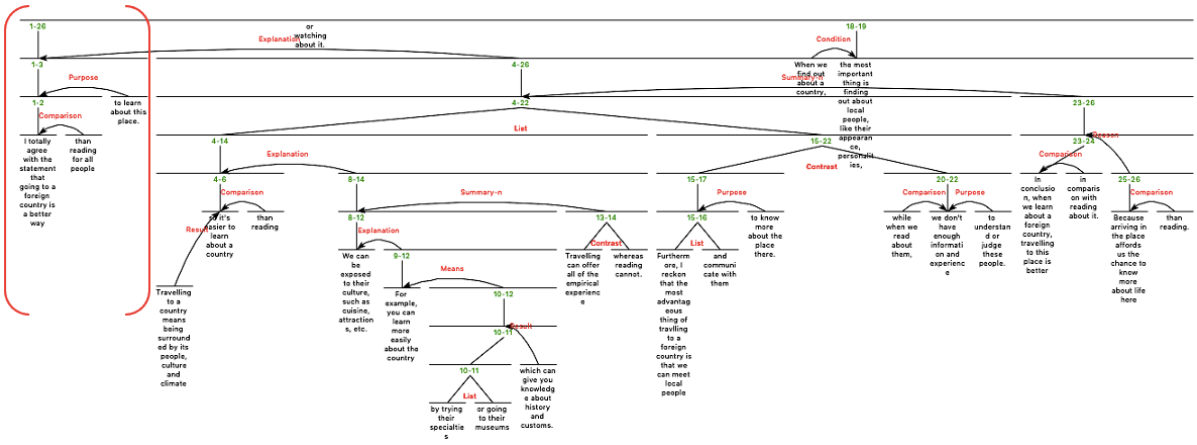

Figure 4.4: Incorrect place of background in Pre-A

In the RST structure, there exists no *background* relation at the beginning of the essay since this student started the essay by stating her opinion. Without any background information to introduce the topic and set the scene for the claim, Pre-A gives a sense of abrupt beginning and confuses the readers. Were a background sentence to be included, global coherence would be improved in this instance as this sentence is related to the whole essay by defining the context for the ensuing argument.

The last type of error is the inappropriate positioning of topic sentence or even the lack thereof with four instances in the pretest. Instead of outlining the main idea of the paragraph at the beginning, some students summarized the information in the concluding sentence of the paragraph. In some cases, there even exists no topic sentence that becomes the top node of the spans as the following diagram of Pre-C illustrates:

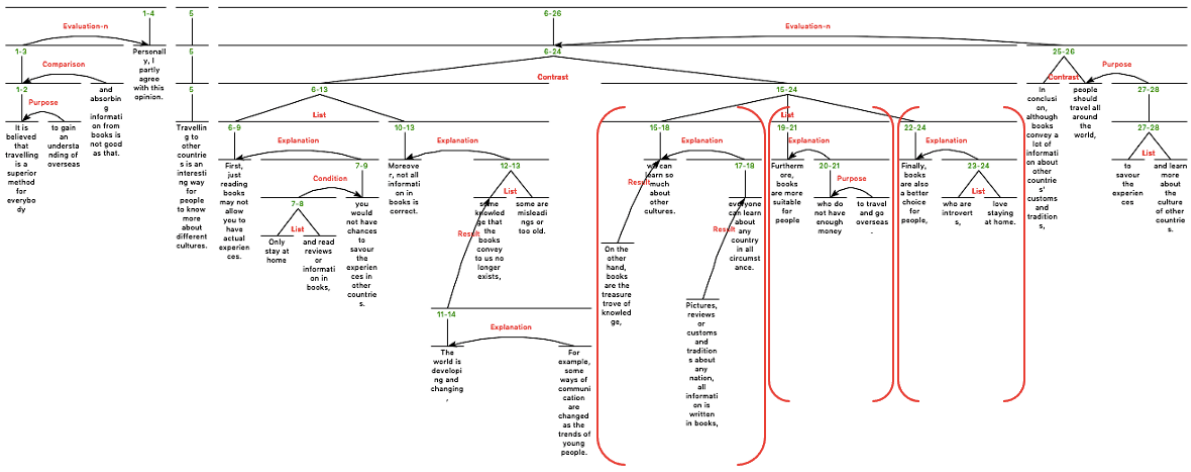

Figure 4.5: Incorrect place of topic sentence in Pre-C

As can be easily seen, Units 15-18, 19-21 and 22-24 are connected to each other in a *list* relation given the cohesive device used in each unit. However, there exists no top node of these three schemes, making the RST tree look like “bushes” (Peng, 2009, p. 229), which is

indicative of the lack of an overarching sentence that encompasses the content of the three schemes. Skoufaki (2020) asserted that since a typical paragraph in English would have the first sentence cover all ideas expressed in it, the fact that there are ideas beyond the scope of the first sentence leads to incoherence in the text.

4.1.2. Research Question 2: How well are global coherence relations established in L2 learners' essays after the metacognitive intervention?

After metacognitive training, students were required to revise the pretest essays (posttest 1) and compose an independent essay (posttest 2). Analysis shows that global coherence in these posttests is quite successfully established. Specifically, all posttest 1 essays have background information to introduce the topic and the argument before the student's perspective is presented, which helps ensure a higher degree of global coherence between the introduction and body paragraphs. Also, no error related to the incorrect positioning of topic sentence was found. However, there are six instances that violate the constraints of completedness and connectedness with at least one in each essay. This result indicates that there is irrelevant information in all posttest 1 essays.

The following table summarizes the types and corresponding frequencies of these errors of Posttest 1 essays:

Table 4.2: Types and frequencies of coherence error in posttest 1 essays

Essay	Post-1A	Post-1B	Post-1C	Post-1D	Post-1E
Incoherence between thesis statement and body part	0	0	0	1	0
Incoherence between topic sentence and supporting sentences	1	0	0	0	1
Incoherence between conclusion and body part	0	1	1	0	1
Incorrect place of background	0	0	0	0	0
Incorrect place of topic sentence	0	0	0	0	0

The mistake that occurs most frequently in this group of essays is the incoherence between the conclusion and body part with three out of five essays found to have this error. One such instance can be seen in Post-1B:

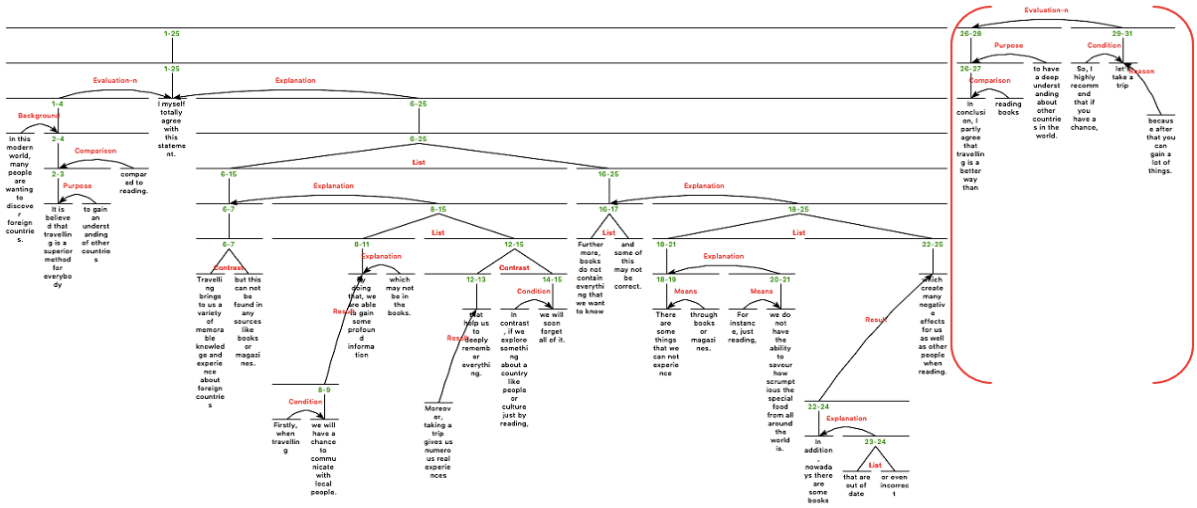

Figure 4.6: Incoherence between conclusion and body part in Post-1B

RST tree of Post-1B demonstrates the lack of *summary* relation between the conclusion and the rest. The two body paragraphs all aim to support the student's opinion that travelling is better than reading in exploring other countries, which is connected to thesis statement ("I totally agree") via *explanation* relation. However, in the conclusion part (Units 26-31) the students posits that she "partly agrees". Such content irrelevancy is observable in the RST tree with the lack of *summary* relation between Units 26-31 and the rest, which to some extent affects the essay's global coherence.

Furthermore, in Post-1A and 1E, global coherence is not established between topic sentence and the remaining segment, as illustrated in the following diagram from Post-1A with the lack of a connecting arrow between them:

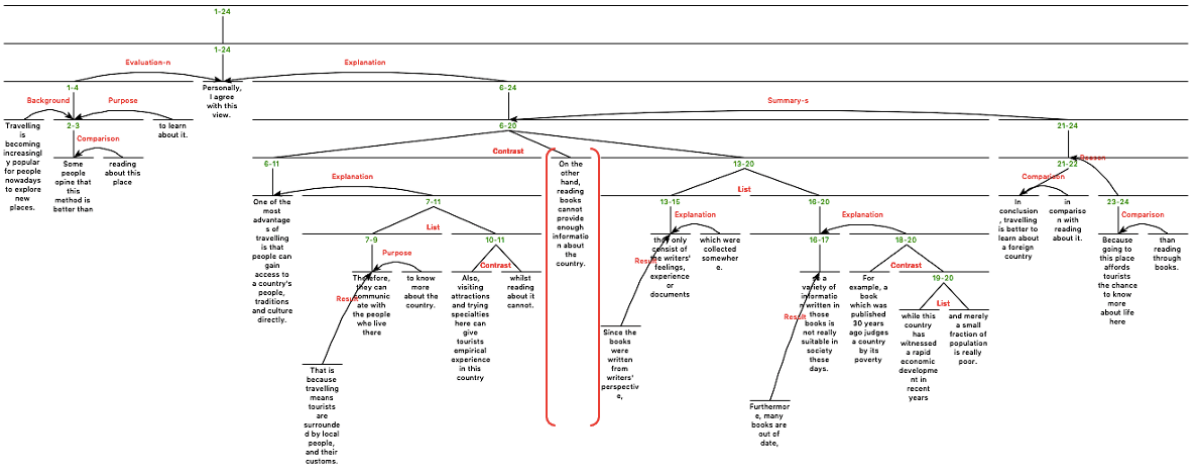

Figure 4.7: Incoherence between topic sentence and supporting sentences in Post-1A

The central claim of “books cannot provide enough information about the country” in Unit 12, which refers to the insufficient amount of information, is not related to the rest of the paragraph (Units 13-20) that alludes to the subjective and out-of-date nature of information in books. Though this essay only has one error, it seriously compromises global coherence spanning the whole paragraph.

Lastly, there is weak establishment of global coherence between the thesis statement and body paragraph in Post-1D:

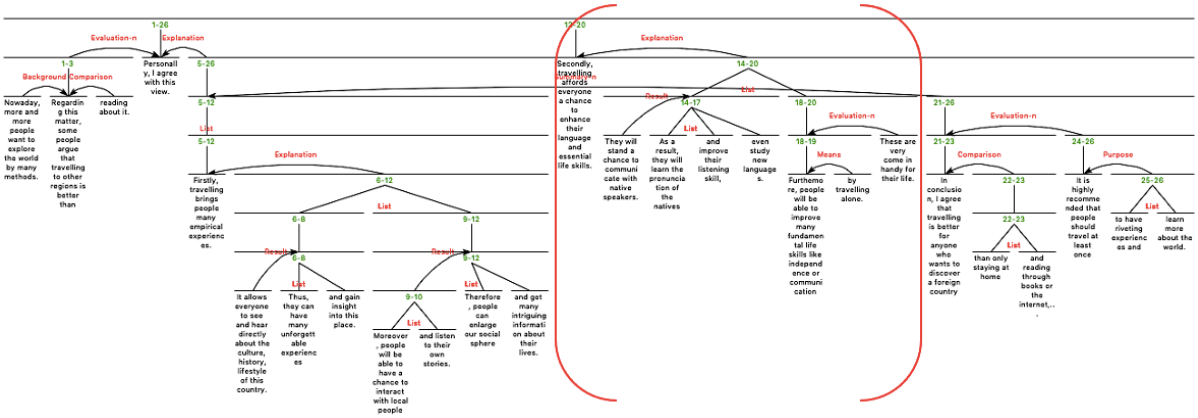

Figure 4.8: Incoherence between thesis statement and body part in Post-1D

It is demonstrated in the RST tree that the whole scheme from Units 13-20 is not connected to the thesis statement. Specifically, the essay’s scope is confined to the roles of travelling and reading in exploring other countries. Though student D states her preference for travelling as the more effective method, in the second paragraph, she touched upon improvements in linguistic and life skills as benefits of travelling. This argumentation is marked as incoherence between thesis statement and body since it falls beyond the scope of the essay and the claim in thesis statement.

Regarding posttest 2, qualitative analysis shows that among the five essays, global coherence is successfully established overall. These essays’ introduction provides information that defines the scope of the argument and the thesis statement that explicitly presents the main idea to orientate body paragraphs. Furthermore, within each paragraph, topic sentence also outlines the ideas to be elaborated in the following segment. However, there are three instances of irrelevance between the conclusion and the body found in Post-2B, 2D and 2E. The specific types and frequencies of coherence errors found in posttest 2 are presented in the table below:

Table 4.3: Types and frequencies of coherence error in posttest 2 essays

Essay	Post-2A	Post-2B	Post-2C	Post-2D	Post-2E
Incoherence between thesis statement and body part	0	0	0	0	0
Incoherence between topic sentence and supporting sentences	0	0	0	0	0
Incoherence between conclusion and body part	0	1	0	1	1
Incorrect place of background	0	0	0	0	0
Incorrect place of topic sentence	0	0	0	0	0

In Post-2B, 2D and 2E, the conclusions include information that is either irrelevant or falls beyond the scope of the essay. Given that the role of conclusion is to summarize the main ideas without introducing unrelated one, the inclusion of such information makes it disconnected from the span of body part.

One example of the incoherence between the conclusion and body paragraph is Post-2B:

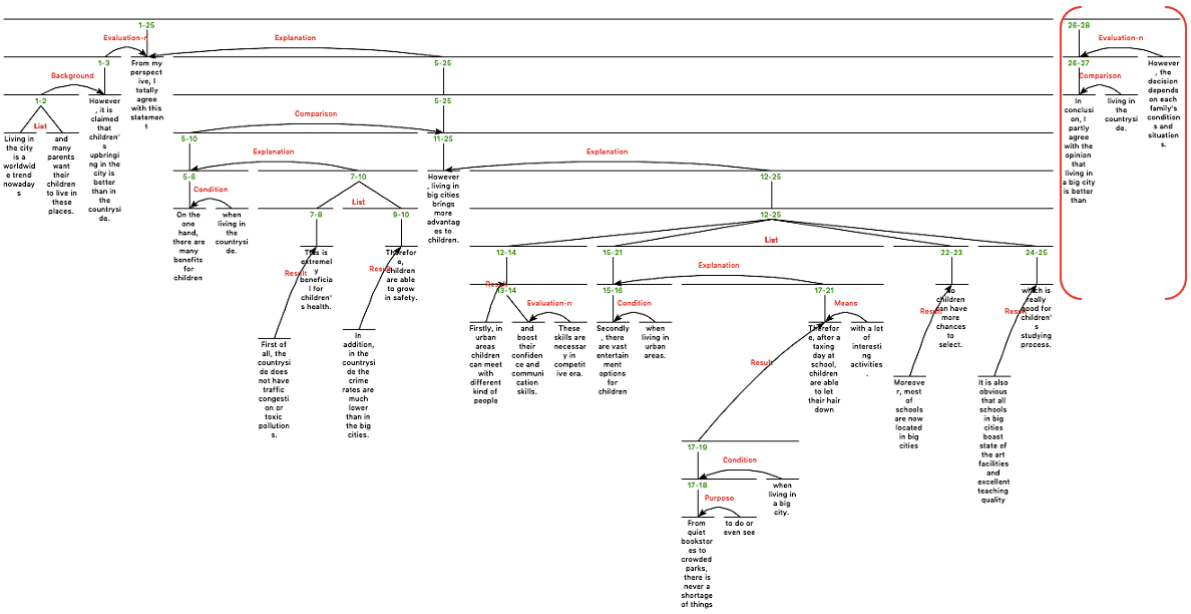

Figure 4.9: Incoherence between conclusion and body part in Post-2B

In the RST tree, Units 26-28 are disconnected from the whole scheme application, representing content irrelevancy between these two segments. Similar to Post-1B, in thesis statement, the student claimed that she “totally agrees” with the opinion that childrearing in

the city is better than in the countryside and body paragraphs also aim to support this claim; however, in the conclusion, the student failed to create a sense of coherence with the previous section by claiming that “I partly agree with the opinion that living in the city is better a living in the countryside”. The difference between “totally agree” in thesis statement and “partly agree” in the conclusion renders the latter part disconnected from the rest of the essay.

4.1.3. Research Question 3: Is there any improvement in global coherence in students’ writing as rated by the raters?

The scores given by 20 raters to pretest and posttest essays on eight criteria related to coherence are analyzed using paired samples *t*-test. The results are presented in the following tables:

Table 4.4: Mean scoring for each criterion of pretest, posttest 1 and posttest 2 essays

Criteria[1]	C1	C2	C3	C4	C5	C6	C7	C8
Pre-A	1.65	4.70	4.15	2.85	2.95	2.90	2.90	3.65
Pre-B	2.30	4.85	3.40	4.10	3.30	3.40	3.80	2.75
Pre-C	2.50	4.80	3.70	4.45	2.40	2.60	4.10	2.45
Pre-D	3.89	4.11	2.26	3.84	2.00	1.95	2.79	3.11
Pre-E	2.50	3.30	2.35	4.10	2.65	2.85	2.40	3.20
Post-1A	4.00	4.65	4.60	4.85	2.6	2.45	4.40	3.80
Post-1B	4.30	4.85	4.55	4.25	4.20	4.20	4.35	3.50
Post-1C	4.15	4.80	4.35	4.80	4.40	3.90	4.05	3.80
Post-1D	4.35	4.75	2.21	4.25	3.00	3.00	4.30	3.90
Post-1E	4.35	4.70	3.95	3.50	3.10	3.10	3.70	3.80
Post-2A	4.25	4.85	4.35	4.70	4.35	4.45	4.50	4.10
Post-2B	4.35	4.70	4.30	4.80	4.55	4.60	4.20	4.40
Post-2C	4.70	4.95	4.40	4.50	4.35	4.40	4.40	4.25
Post-2D	4.50	5.00	4.75	4.85	4.60	4.65	4.50	3.60
Post-2E	4.50	4.80	4.75	4.60	4.60	4.60	4.50	3.00

[1] The criteria are:
C1: The essay has an introduction which clearly states the context for the topic, including time, place and circumstance as necessary.
C2: The thesis statement in the introduction clearly states purpose and/or orientates the reader in terms of content.
C3: The body paragraphs are related to the thesis of the essay/contribute to a single idea or thesis stated in the introduction.
C4: Each paragraph discusses a separate aspect of the topic/ Ideas discussed in different body paragraphs do not overlap with each other.
C5: Each topic sentence fully clearly states the purpose or idea to be elaborated on in the paragraph.
C6: The remaining section of each paragraph clarifies or supports the idea stated in the topic sentence with relevant reasoning, evidence and/or example.
C7: The sentences in each paragraph follow each other logically. The reader can follow the relationship between sentences easily.
C8: The conclusion successfully recaps the path of the discussion in the essay without introducing new and unrelated information.

Table 4.5: Results of paired samples t-tests between pretest essays and posttest

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	3.1988	100	.52879	.05288
	Posttest1	4.0307	100	.45375	.04538
Pair 2	Pretest	3.1988	100	.52879	.05288
	Posttest2	4.4818	100	.31639	.03164

Paired Samples Correlations

		N	Correlation	Significance One-Sided p	Significance Two-Sided p
Pair 1	Pretest & Posttest1	100	.428	<.001	<.001
Pair 2	Pretest & Posttest2	100	.066	.257	.513

Paired Samples Test

		Paired Differences					t	df	Significance One-Sided p	Significance Two-Sided p
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper				
Pair 1	Pretest - Posttest1	-.83190	.52906	.05291	-.93688	-.72692	-15.724	99	<.001	<.001
Pair 2	Pretest - Posttest2	-1.28300	.59798	.05980	-1.40165	-1.16435	-21.455	99	<.001	<.001

Paired Samples Effect Sizes

			Standardizer[a]	Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
Pair 1	Pretest - Posttest1	Cohen's d	.52906	-1.572	-1.864	-1.277
		Hedges' correction	.53107	-1.566	-1.857	-1.272
Pair 2	Pretest - Posttest2	Cohen's d	.59798	-2.146	-2.501	-1.787
		Hedges' correction	.60026	-2.137	-2.491	-1.780

Results from paired samples *t*-test comparing the scorings of pretest and posttest 1 show that there is a significant difference between them (M = -.83, p < .001). Specifically, the mean scores increased by 0.83 from 3.20 in pretest to 4.03 in posttest 1. This implies that students made significant improvements in terms of coherence in their revised version compared to the original one.

It is noteworthy that results from paired samples *t*-tests comparing pretest and posttest 2 yield a more significant difference (M = -1.29, p < .001). This result suggests that students made a more significant improvement in terms of coherence in their independent essay compared to posttest 1. It can be inferred from the mean score of 4.5 in posttest 2 that these essays mostly fulfil the coherence criteria. Further, in both cases, Cohen's d in two *t*-tests is larger than medium (.53 and .6), therefore it can be deduced that the difference is not only significant but also meaningful.

4.1.4. Research Question 4: What aspects of global coherence have improved, if any, across essays written before and after the intervention?

Raters' scores indicate that students' writings did improve after the metacognitive training session with a more significant betterment between the pretest essays and posttest 2, which is corroborated by qualitative analyses.

One aspect that was scored more coherent across versions of writing is the inclusion of background at the beginning. The significant difference between ratings of the criterion 1 between pretest and posttest essays attests to this improvement. Specifically, four out of five pretest essays, except Pre-D, were given low scores at an average of 2.24; however, after metacognitive training, all scores in this criterion substantially increased to 4.23 and 4.46 for posttest 1 and 2 respectively. Qualitative analysis also lends support for these quantitative statistics. Specifically, four out of five pretest essays lack background information, which makes the introduction part abrupt. For instance, in the pretest, student A jumps straight into stating her opinion without providing any relevant information, which is indicated by the lack of *background* relation in the following RST tree:

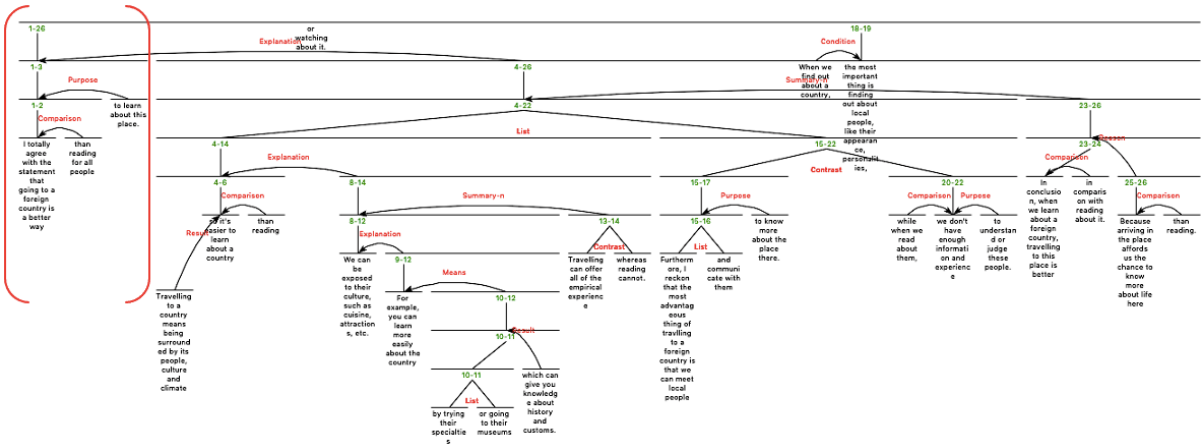

Figure 4.10: Incorrect place of background in Pre-A

By comparison, this error was not found in the two posttests, since all students successfully included background before presenting their opinion. In her two posttests, student A managed to incorporate relevant background information at the beginning, which is clearly illustrated by *background* relation the two following RST trees:

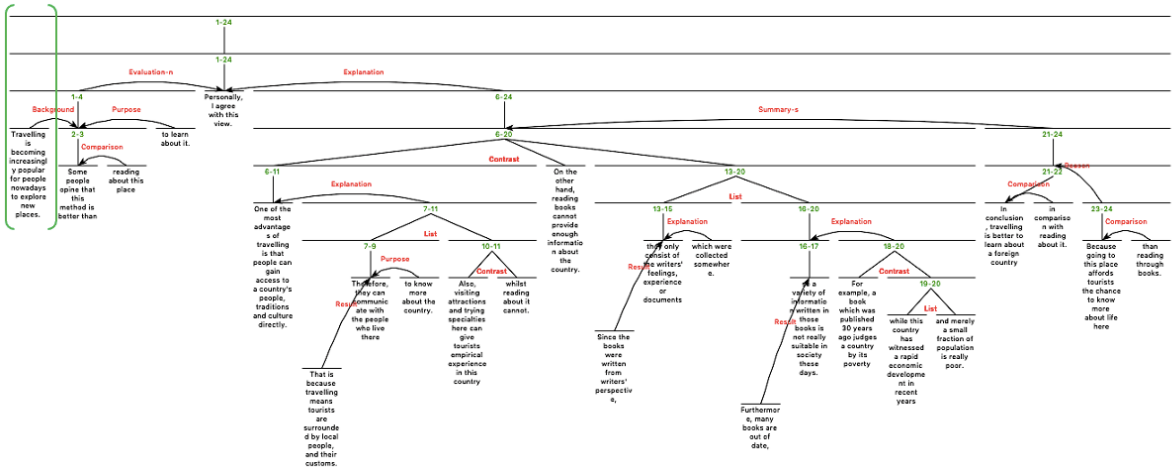

Figure 4.11: Correct place of background in Post-1A

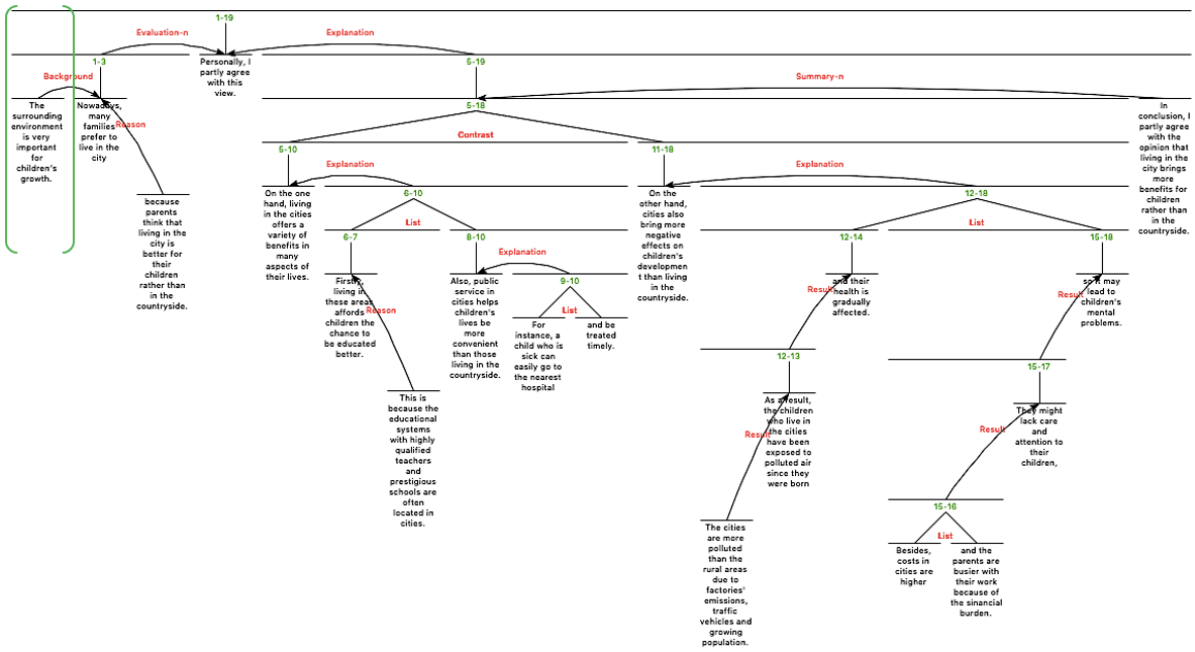

Figure 4.12: Correct place of background in Post-2A

The inclusion of background information plays a role in ensuring the smooth lead-in to the argument of the essay given that background sets the scene for the whole essay by situating the argument in the relevant circumstance and framing the scope of the essay, thus helping readers to better comprehend the argument.

Another area of improvement is the relevance between body paragraphs and thesis statement. Specifically, the scorings of Pre-B, C and E for this aspect were 3.40, 3.70 and 2.35 respectively, which increased to 4.55, 4.35 and 3.95 in posttest 1 respectively. It can be deduced that raters also considered these essays to have better global coherence establishment between thesis statement and body paragraphs than the pretest. This statistical finding is closely corroborated by RST-based analysis. To be specific, the irrelevance between thesis statement and body exists in all pretest essays. For example, thesis statement of Pre-E present student's and the aim of the essay to "discuss the advantages of travelling". Nevertheless, a sense of irrelevancy exists between this sentence and the second body paragraph which centers around the disadvantages of this method. This seriously affects global coherence since it violates the connected/completedness constraint over a large span which is exhibited by the dangling scheme of Units 17-21in the following RST tree:

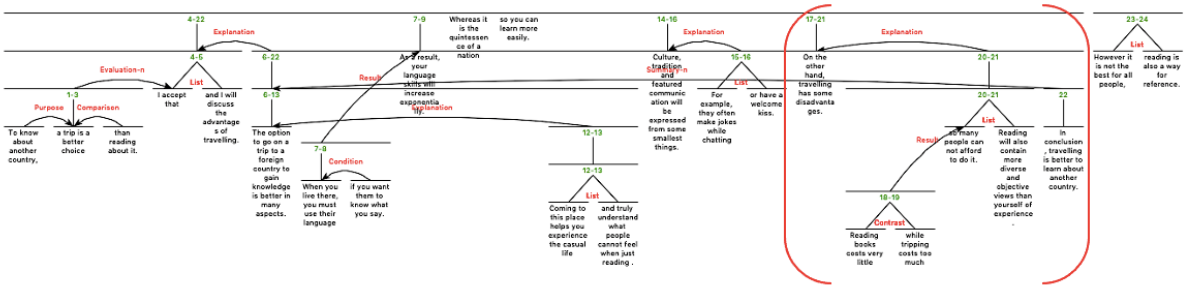

Figure 4.13: Incoherence between thesis statement and body part in Pre-E

After metacognitive training, however, all three students made improvements in this aspect. For example, Post-1E witnessed the replacement of the irrelevant content of the second paragraph with the advantages of travelling for discovering other countries. This change succeeded in better aligning body paragraphs with thesis statement.

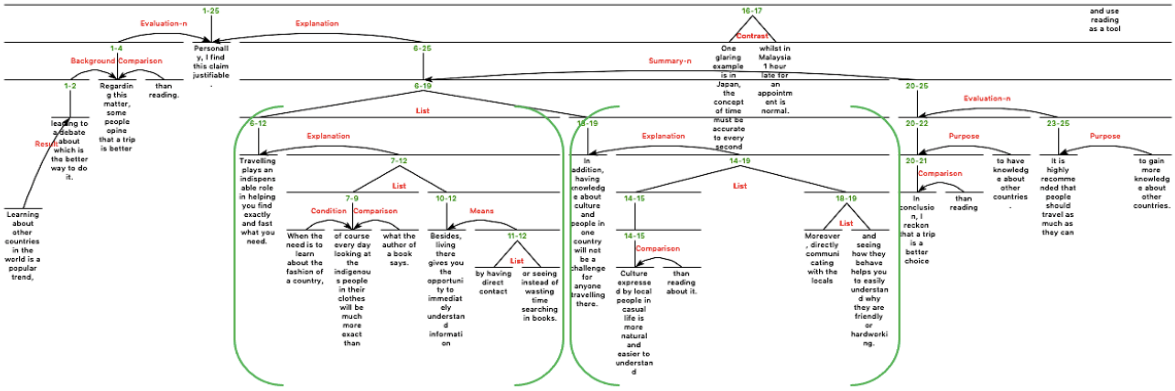

Figure 4.14: Coherence between thesis statement and body part in Post-1E

Meanwhile, in posttest 2, the raters' scorings for this aspect range from 4.30 to 4.75, indicating a high degree of global coherence. Qualitative analysis also shows that all students managed to create the global link between thesis statement and ideas expressed in the body paragraphs, for example:

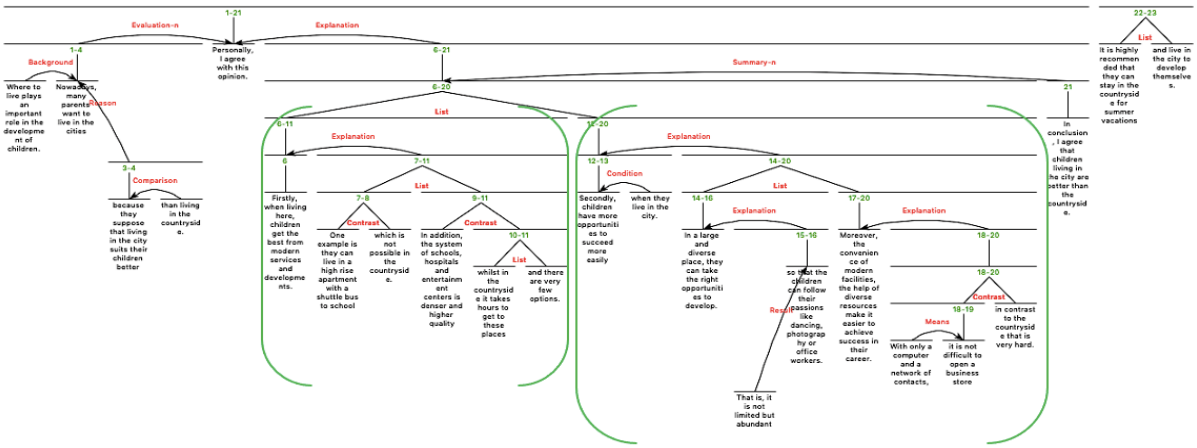

Figure 4.15: Coherence between thesis statement and body part in Post-2E

In the above RST tree of Post-2E, ideas expressed in Units 6-11 and Units 12-20, including modern services and more opportunities for success are in *list* relation and all aim to support the claim in thesis statement via *explanation* relation. Given that all parts of the body and thesis statement are connected, it can be deduced that this essay's global coherence is well established.

Regarding the coherence between topic sentence and remaining segments of the paragraph, three out of four students made improvements in this aspect between pretest and posttest 1. This is attested by the increase in the scorings of criteria 5 and 6 from an average of 2.7 to 3.4. Particularly, essays by students B and C witnessed the most pronounced increase, from 3.35 to 4.2 and 2.5 to 4.15. These statistics are corroborated by RST-based analysis. In each of the four pretest essays except for Pre-D, there was at least one instance of incoherence in this regard. After metacognitive training, students B, C and D made changes to either topic sentence or supporting ideas to establish global coherence between them. For example, in Pre-C, the central idea of travelling as "an interesting way" (Unit 5) is not remotely related to the disadvantages of reading (Units 6-14) and this irrelevance is indicated by the lack of the arrow connecting the two schemes in Figure 4.16:

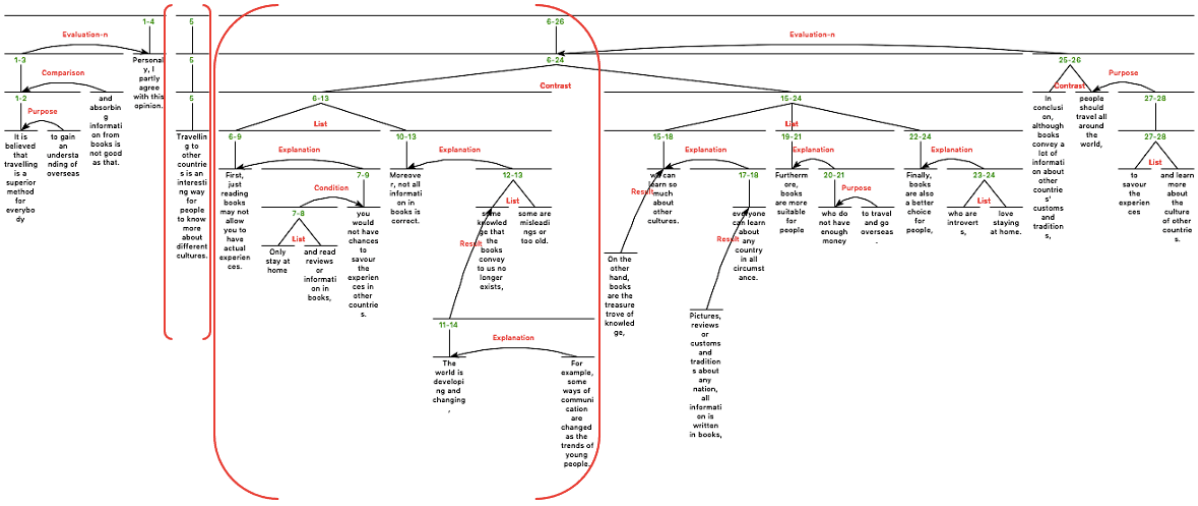

Figure 4.16: Incoherence between topic sentence and supporting sentences in Pre-C

By comparison, in Post-1C, there was a change of the word "interesting" into "better" and instead of merely discussing the disadvantages of reading, the student used a *contrast* relation between these two methods to closely align topic sentence with the supporting ideas.

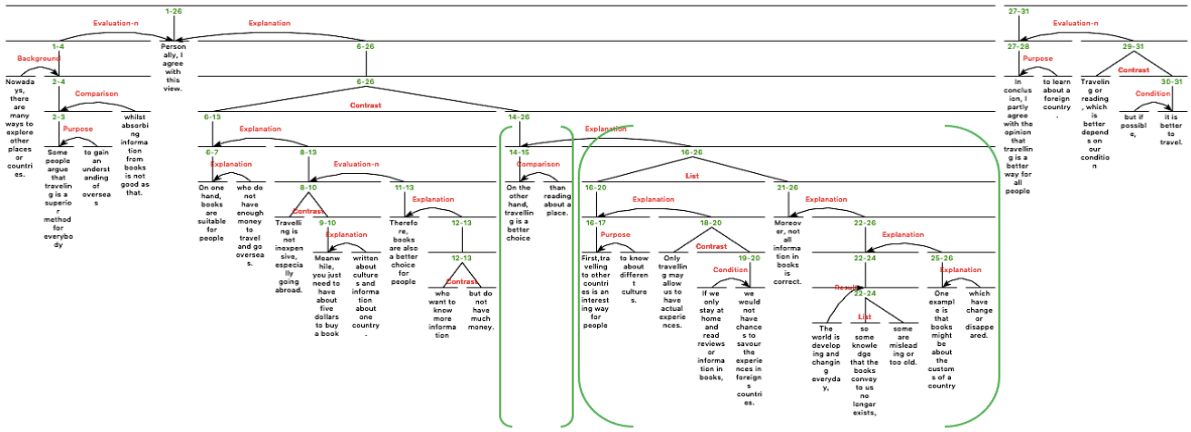

Figure 4.17: Coherence between topic sentence and supporting sentences in Post-1C

The effects of this change can be observable in the above RST tree in that all the supporting ideas within one paragraph are linked to the topic sentence via *explanation* relation.

Improvements in global coherence between topic sentence and the supporting ideas were also registered in posttest 2. Raters' scorings related to this aspect among posttest 2 essays were 4.52 on average, which is higher than pretest and posttest 1. In all essays, a sentence is found at the beginning that covers the scope of ideas discussed in each paragraph. For example, in Post-2C:

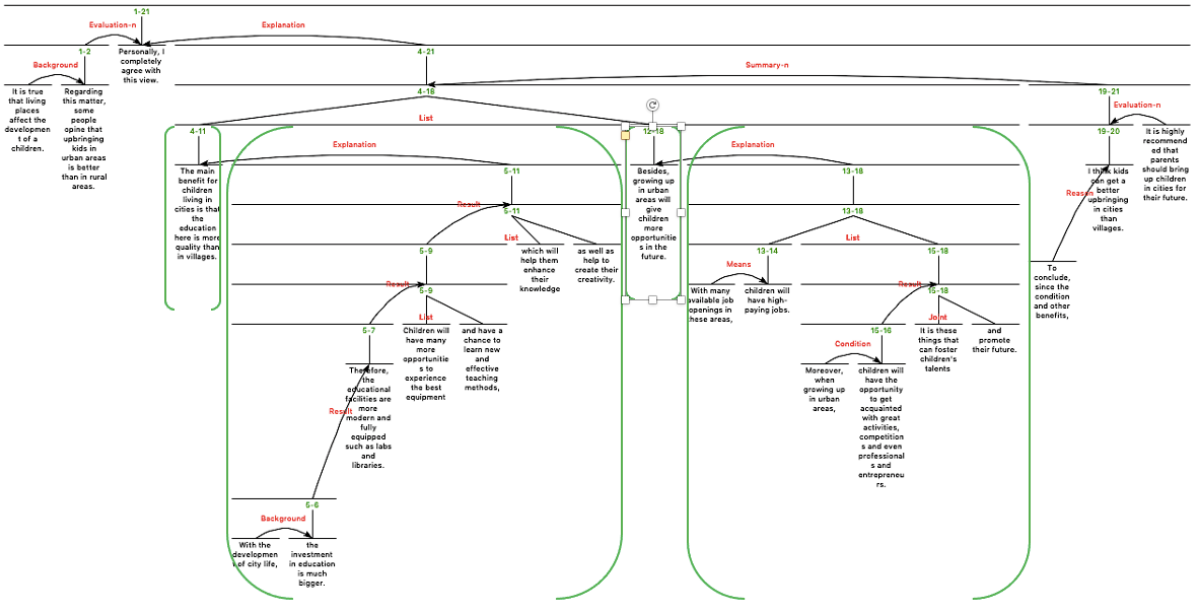

Figure 4.18: Coherence between topic sentence and supporting sentences in Post-2C

In the first paragraph, student C claimed that education quality in cities is better than in the countryside (Unit 4) and then expounded the available educational facilities and benefits students can obtain in Units 5-11. The close relevance in content is made observable by an

explanation relation between topic and supporting sentences without any dangling units. The same high level of global coherence is also witnessed in the second body paragraph.

The correct place of topic sentence is another area of improvement. The mean scoring of criteria 5, which concerns this aspect, was 2.66 for pretest, and it increased to 3.52 and 4.49 for posttest 1 and 2 respectively. RST-based analysis also lends support to this statistical finding. It shows that in pretest essays, the sentence covering all ideas expressed in the paragraph is not put first. In the posttests, on the other hand, all students started the paragraph with a topic sentence delineating the main ideas to be expounded in the rest of the paragraph. For example, in Pre-D, the main idea of the paragraph is put at the end of the paragraph whereas in Post-1D and 2D, this sentence was brought to the beginning. This change is demonstrated in the following RST trees. Particularly, in figure 4.21, RST tree is skewed to the right with the main idea being Unit 18; however, in figures 4.22 and 4.23, a shift to left-branching with the arrows pointing the left is clearly seen:

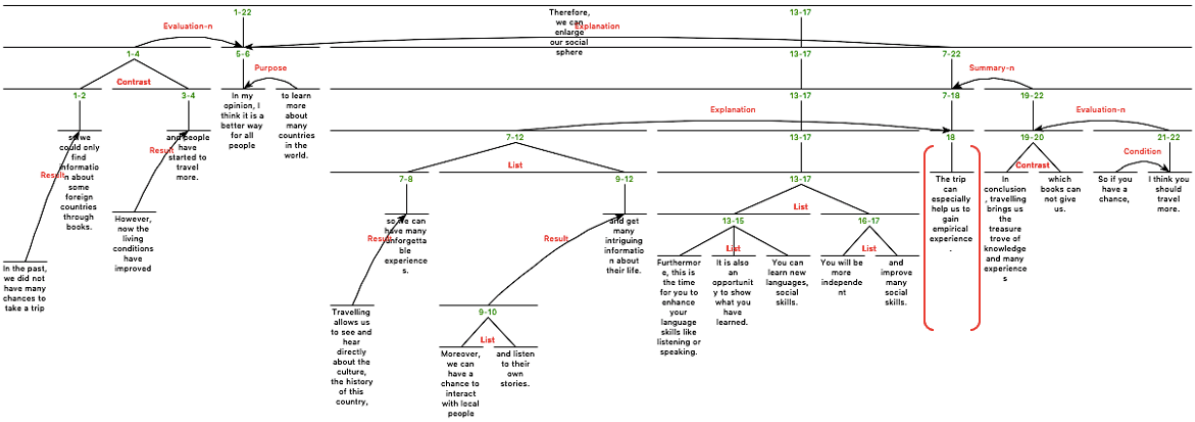

Figure 4.19: Incorrect place of topic sentence in Pre-D

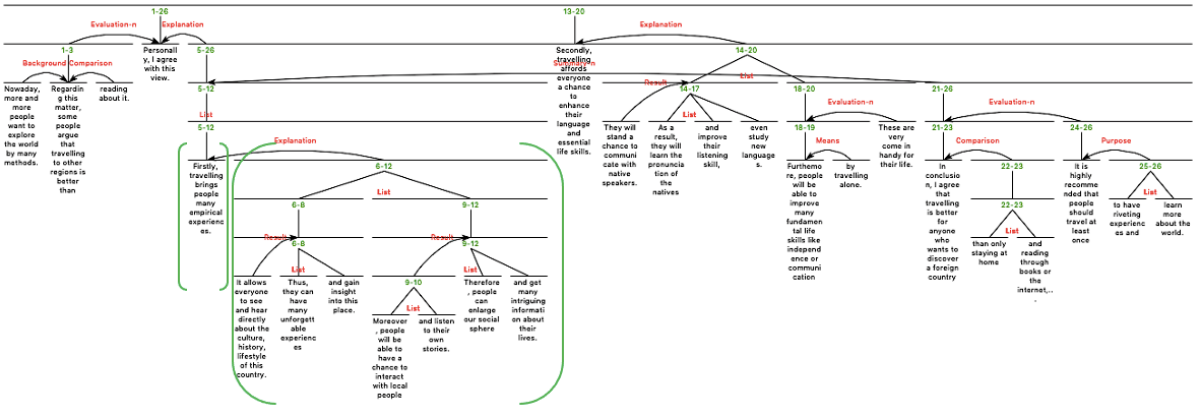

Figure 4.20: Correct place of topic sentence in Post-1D

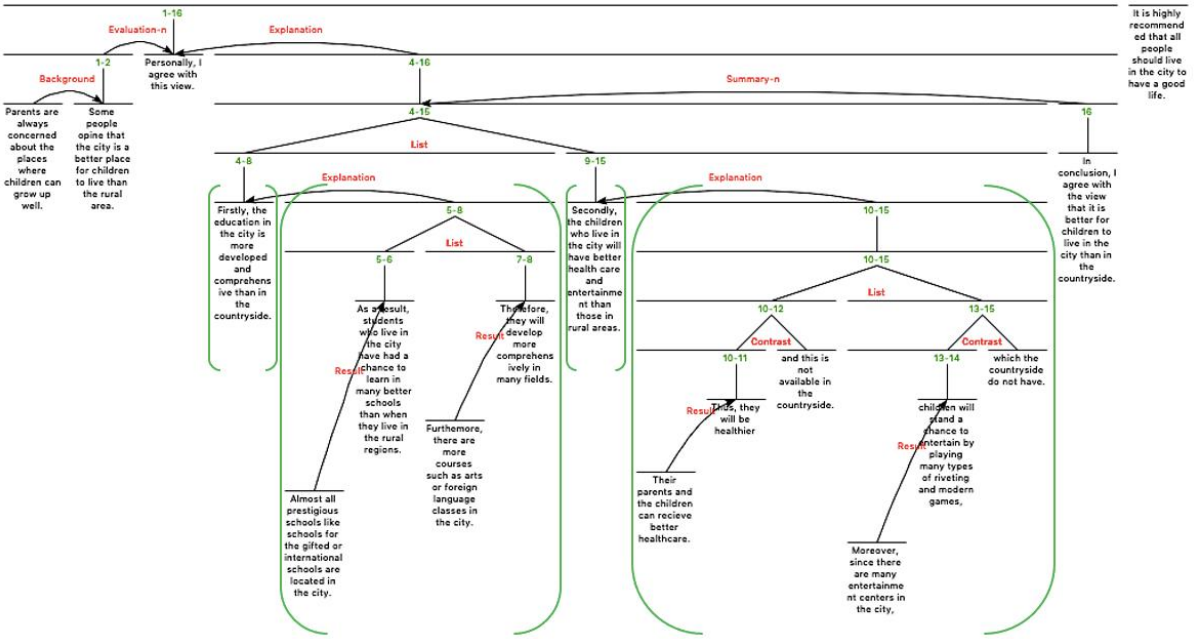

Figure 4.21: Correct place of topic sentence in Post-2D

In short, results of quantitative and qualitative analyses show that after metacognitive training, all essays successfully establish coherence related to background information or topic sentence. Meanwhile, most posttest essays witnessed improvements in the coherence relations between thesis statement and body paragraphs as well as between topic sentence and supporting sentences. Interestingly, compared to the improvement between pretest and posttest 1, that between pretest and posttest 2 is more pronounced and covers nearly all aspects except for the coherence between the conclusion and the body part.

4.2. Discussion

It is clear from the findings that among all types of coherence error, those related to incoherence between parts constituted the highest frequency and they were also the only error to appear in all pretest and posttest essays. This concurs with the findings by Ahmadi and Parhizgar (2017) who found that irrelevant content instances constituted 19.1% in the total number of 188 errors identified in 64 texts. The lack of *background* relation was also found, which undermines global coherence since “background helps the reader to better communicate with the text” (Ahmadi & Parhizgar, 2017, p. 27). Lastly, incorrect place of topic sentence found in this study is in line with that of Skoufaki (2020).

However, improvements in virtually all types of coherence error were witnessed in the two posttests. This strongly suggests that metacognitive training was positively correlated with the degree of global coherence in students’ essays, which accords with Briesmaster and Etchegaray (2017). This finding speaks to the positive impact of metacognitive training on L2 students’ writing proficiency, which attests to findings of studies such as Larkin (2009), Lv and

Chen (2010), Panahandeh and Asl (2014), Teng (2016) or Tsiriotakis et al. (2020). The most striking result to emerge from the data is that global coherence of revised text is not as well established as that of the independent essay.

The positive correlation between metacognitive training and improved writing quality can be accounted for on three grounds. Firstly, metacognitive training helps ease the strain imposed on working memory (Kellogg & Whiteford, 2009; Graham et al., 2012). In the present study, the reduction of the demands on working memory was achieved by genre approach. Students in the present study received explicit genre instruction encompassing knowledge of opinion essay, its purpose and rhetorical structure. Such improved metacognitive knowledge of the task is facilitative for the process of establishing global coherence in writing in that it enables the student to check whether the pieces of information coherently fit into the corresponding sections. This would lessen the imposition on working memory and spare space for other processes, according to Lee and Mak (2018). Another ground is the improved evaluation ability. During the metacognitive training, students were given low- and high-quality models for observation, analysis and evaluation activities. Therefore, they might have gradually enriched their knowledge of the criteria of a globally coherent composition and enhanced their evaluation competence. Also, in the present study, the students were given guided and scaffolded feedback during writing conferences. Particularly, graduated feedback scheme with metacognitive questions such as “Why is this part problematic?” or “How can you fix this error?” urged them to draw on metacognitive knowledge to identify the discrepancies between their intended and current state of essay, which also sharpens evaluation ability. This improved ability was mobilized in posttest stage to recognize problems related to global coherence and prompt the implementation of appropriate modification strategies to produce a coherent text (Cumming & So, 1996; MacArthur, 2012; Wischgoll, 2016). This is in line with Hayes’ (2012) claim that judgmental skills are requisite “to detect problems in text and to recognize opportunities for improving text” (p. 17). In short, genre approach to writing in this study facilitates the proposer while the provision of models and feedback might benefit the reviser at process level in Chenoweth and Hayes’ (2001) model of written language production.

Meanwhile, the higher degree of improvement in posttest 2 compared to posttest 1 can be accounted for by the fact that in revising a text, students need to deploy a wider range of processes, particularly metacognitive ones. According to the new model of revision by Hayes (2012), revision is a highly complex process. Specifically, they need to determine the purpose of revision and identify areas of problems which not only involves reading comprehension skills but also knowledge of revision criteria and of good writing. Subsequently, they need to generate different possible correction alternatives. However, error identification does not necessarily lead to successful correction, as Hayes (2004) noted in his correction-first position

that though students might possess necessary knowledge for identifying problems, revision is more demanding and there are “at least some problems that they fail to correct” **(**Hayes, 2004, p.16). Such a demanding nature of revision is further compounded by the fact that participants in the present study are novice students who are considered to lack task schema for global revision (Butler & Britt, 2011; MacArthur, 2012). In other words, they are posited to lack knowledge of revision and strategies for modification on a global scale, including the deletion, addition, movement or changing of parts of an essay to guarantee overall coherence.

The findings also suggest that RST can be facilitative for teaching writing in two ways. Firstly, RST places emphatic stress on the relations between parts of an essay; therefore, students might draw on this knowledge to pinpoint the relations between these parts and sequence them in a coherent manner. Knowledge of RST can also enable students to identify problems related to textual organization for modification purposes. In other words, the more attention paid to the links between parts plays a role in reducing the probability of content irrelevancy. Secondly, Traxler and Gernsbacher (1993) assert that to produce a written discourse, one needs to construct two mental representations of the writing. One representation concerns the intended ideas while the other represents the text as it is written. RST tree is beneficial in that it makes these representations more observable. According to Man (2005), a more tangible map of the written text enables students to identify mistakes more successfully since the disconnected or dangling units are explicitly exhibited by the lack of connecting arrows. Lastly, strong correlations between quantitative and RST-based analyses in this study implies that RST can be implemented in writing lessons for textual analysis with a high degree of precision, which is consistent with Taboada and Mann (2006a). Indeed, as Pelsmaekers et al. (1998) noted, RST is an additional tool that can facilitate student’s language proficiency.

However, one noteworthy point emerging from the study is that RST algorithm favours a right-branching structures with RST trees typically “skewed to the right” (Marcu, 2000, p. 137). Specifically, he asserted that the best RST trees often have a right-to-left directionality corresponding to a deductive style in which the ideas naturally unfold following a topic sentence. In this study, the researcher strictly followed the principles of RST so inductive style is marked as incorrect place of the topic sentence. However, the researcher would argue that such preference overlooks inductive style as a popular organization model; therefore, this right-branching principle should be re-considered so that the range of texts RST trees can cover can be more comprehensive.

Another point worth discussing is that sometimes incoherence can be attributed to linguistic limitations rather than logical problems. In the text, there are two instances which were marked as dangling structure due to the mismatch in word meaning. For example, in Post-1A, the

student claimed “reading books cannot provide enough information about the country”; however, in the following sentences, subjective and out-of-date nature of information in books was mentioned. Though in the analysis, the researcher categorized it as incoherence between topic sentence and supporting sentences, this error might not stem from students’ lack of awareness in coherence. Rather, it is possible that linguistic limitations of this student led to the inappropriate choice of the word “interesting”. In the light of this, it is advisable that alongside rhetorical structure and coherence, lessons should also focus on improving students’ linguistic ability so that students can communicate their intended ideas.

CHAPTER 5: CONCLUSION

5.1. Summary of Findings

This study was conducted online with the participation of five students who were taught strategies to establish global coherence in writing based on Rhetorical Structure Theory. In order to examine the effects of such metacognitive training on the establishment of global coherence, four research questions were posed:

1. How well are global coherence relations established in L2 learners' essays before the metacognitive intervention?
2. How well are global coherence relations established in L2 learners' essays after the metacognitive intervention?
3. Is there any improvement in global coherence in students' writing as rated by the raters?
4. What aspects of global coherence have improved, if any, across essays written before and after the intervention?

Using both qualitative and quantitative methods, the results of the present research indicate that before metacognitive training, global coherence in students' writings was not well established with high frequencies of coherence errors in all essays. Those errors encompass (1) incoherence between thesis statement and body part, (2) incoherence between topic sentence and supporting sentences, (3) incoherence between conclusion and body part, (4) incorrect place of background and (5) incorrect place of topic sentence, among which incoherence between parts was most frequent. However, after metacognitive training, global coherence was quite well established in posttest 1 with the first three types of errors found at a lower frequency. Meanwhile, for posttest 2, the only type of error found was incoherence between conclusion and body part, indicating a high degree of global coherence.

The higher score of the two posttests compared to pretest indicates that metacognitive training did enhance students' ability to construct a more globally coherent text. Areas of improvement emerging from qualitative analysis are (1) the inclusion of background information, (2) the inclusion of topic sentence (3) the coherence between thesis statement and body part and (4) the coherence between topic sentences and supporting sentences. This speaks to the positive correlation between metacognitive training and writing proficiency of L2 learners. One salient finding is that global coherence established in posttest 2 fares better than posttest 1 which attests to the more challenging nature of revision.

These findings also suggest the potential implementation of RST in teaching to facilitate students' writing proficiency since knowledge of this theory enables students to evaluate their own writings to identify areas of incoherence and thus devise appropriate strategies to modify.

5.2. Pedagogical Implications

The findings of this study may be of assistance to L2 teachers and learners as well as academics. Teachers can draw on these findings to integrate explicit instructions of RST in their lessons. Introducing a wider range of relations and requiring students to identify relations between different units in a piece of writing may facilitate students' ability to construct globally coherent texts. When L2 students are sensitized to coherence relations within an essay, they can better apply them in their own writing in order to achieve better global coherence. Lastly, the results of this research project can offer background information for other researchers interested in the field. Further, it can be the inspiration for other researchers to conduct further studies to make valuable contributions to the current body of research.

5.3. Limitations of the Study

Despite the best efforts made by the researcher, some of the limitations should be acknowledged. Firstly, given time and resource constraints, this research project was conducted on a small scale of five students within a short two-week period, which to some extent limits the generalizability of the findings. Furthermore, it is also notable that qualitative analysis, including the identification of units and relations between them, inevitably involves a certain degree of subjectivity. Similarly, the fact that the researcher also played the role of the teacher in this research project also reduces the objectivity of the findings. The incorporation of quantitative scorings notwithstanding, the results were not totally objective.

5.4. Suggestions for Further Studies

Some recommendations could be taken into consideration by the future researchers of this topic. Firstly, studies into the application of RST to classroom activities can be conducted on a larger scale to address the limited generalizability. Further, instead of looking into the effects of metacognitive training only, future researchers can consider comparing the effects of metacognitive training and cognitive training, or another possible line of research would be the combination of cognitive and metacognitive training on writing proficiency of L2 learners. Should these studies be conducted, the literature on both RST and metacognitive training would be enriched.

5.5. Personal and Professional Development

Conducting this research affords the researcher a valuable chance to deepen my understanding of educational research. Through the lessons, tutorials and process of carrying

out the research, I was introduced to many traditions of educational research, which may prove beneficial in my future. Also, I was able to gain an insight into metacognitive training as well as Rhetorical Structure Theory. Such knowledge and understanding might enable me to implement more successful lessons in the future in order to better facilitate my students' writing proficiency. Also, this research project is a potential research area in which I am interested and therefore, in the future I may be motivated to carry out further studies related to this topic with a better research design to address the limitations of the present one.

REFERENCE

Adornetti, I. (2015). The Phylogenetic Foundations of Discourse Coherence: A Pragmatic Account of the Evolution of Language. *Biosemiotics*, *8*(3), 421–441. https://doi.org/10.1007/s12304-015-9230-7

Ahmadi, A., & Parhizgar, S. (2017). Coherence errors in Iranian EFL learners' writing: A rhetorical structure theory approach. *Language Horizons*, *1*(1), 9-37.

Alfalagg, A. R. (2020). Impact of teacher-student writing conferences on frequency and accuracy of using cohesive devices in EFL students' writing. *Asian-Pacific Journal of Second and Foreign Language Education*, *5*(1). https://doi.org/10.1186/s40862-020-00104-z

Aljaafreh, A., & Lantolf, J. P. (1994). Negative Feedback as Regulation and Second Language Learning in the Zone of Proximal Development. *The Modern Language Journal*, *78*(4), 465–483. https://doi.org/10.1111/j.1540-4781.1994.tb02064.x

Azar, M. (1999). Argumentative text as rhetorical structure: An application of rhetorical structure theory. *Argumentation*, *13*(1), 97-114.

Briesmaster, M., & Etchegaray, P. (2017). Coherence and cohesion in EFL students' writing production: The impact of a metacognition-based intervention. *Íkala, Revista de Lenguaje y Cultura*, *22*(2), 183–202. https://doi.org/10.17533/udea.ikala.v22n02a02

Brown, D. (2014). The type and linguistic foci of oral corrective feedback in the L2 classroom: A meta-analysis. *Language Teaching Research*, *20*(4), 436–458. https://doi.org/10.1177/1362168814563200

Butler, J. A., & Britt, M. A. (2011). Investigating Instruction for Improving Revision of Argumentative Essays. *Written Communication*, *28*(1), 70–96. https://doi.org/10.1177/0741088310387891

Carlson, L., & Marcu, D. (2001). Discourse tagging reference manual. *ISI Technical Report ISI-TR-545*, *54*(2001), 56.

Celce-Murcia, M. (2001). *Discourse And Context In Language Teaching (Cambridge Language Teaching Library)* (1st ed.). Cambridge University Press.

Çepni, S. B. (2016). A Replication Study: Oral Corrective Feedback on L2 Writing; Two Approaches Compared. *Procedia - Social and Behavioral Sciences*, *232*, 520–528. https://doi.org/10.1016/j.sbspro.2016.10.072

Chenoweth, N. A., & Hayes, J. R. (2001). Fluency in Writing. *Written Communication*, *18*(1), 80–98. https://doi.org/10.1177/0741088301018001004

Colognesi, S., Piret, C., Demorsy, S., & Barbier, E. (2020). Teaching Writing-With or Without Metacognition : An Exploratory Study of 11- to 12-Year-Old Students Writing A Book Review. *Lnternational Electronic Journal of Elementary Education*, *12*(5), 459–470. https://doi.org/10.26822/iejee.2020562136

Concha, S., & Paratore, J. R. (2010). Local Coherence in Persuasive Writing: An Exploration of Chilean Students' Metalinguistic Knowledge, Writing Process, and Writing Products. *Written Communication*, *28*(1), 34–69. https://doi.org/10.1177/0741088310383383

Council of Europe (2018). *Common European Framework of Reference for Languages: Learning, Teaching, Assessment. Companion Volume with New Descriptors*. Council of Europe. https://rm.coe.int/cefr-companionvolume-with-new-descriptors-2018/1680787989.

Cumming, A., & So, S. (1996). Tutoring second language text revision: Does the approach to instruction or the language of communication make a difference? *Journal of Second Language Writing*, *5*(3), 197–226. https://doi.org/10.1016/s1060-3743(96)90002-8

Densombe, M. (2014). *The Good Research Guide: For Small-Scale Social Research Projects (UK Higher Education OUP Humanities & Social Sciences Study S)* (Revised ed.). Open University Press.

Duff, P. A. (2014). Case study research on language learning and use. *Annual Review of Applied Linguistics*, *34*, 233.

Elola, I., & Oskoz, A. (2016). Supporting Second Language Writing Using Multimodal Feedback. *Foreign Language Annals*, *49*(1), 58–74. https://doi.org/10.1111/flan.12183

Erlam, R., Ellis, R., & Batstone, R. (2013). Oral corrective feedback on L2 writing: Two approaches compared. *System*, *41*(2), 257–268. https://doi.org/10.1016/j.system.2013.03.004

Farahian, M., & Avarzamani, F. (2018). Metacognitive awareness of skilled and less-skilled EFL writers. *Asian-Pacific Journal of Second and Foreign Language Education*, *3*(1). https://doi.org/10.1186/s40862-018-0052-4

Gernsbacher, M. A., & Givón, T. (1995). *Coherence in Spontaneous Text*. Van Haren Publishing.

Graham, S. (2005). Strategy Instruction and the Teaching of Writing: A Meta-Analysis. In S. Graham, J. Fitzgerald, & C. A. MacArthur (Eds.), *Handbook of Writing Research* (First ed., pp. 187–207). The Guilford Press.

Graham, S., & Perin, D. (2007). A meta-analysis of writing instruction for adolescent students. *Journal of Educational Psychology*, *99*(3), 445–476. https://doi.org/10.1037/0022-0663.99.3.445

Graham, S., McKeown, D., Kiuhara, S., & Harris, K. R. (2012). A meta-analysis of writing instruction for students in the elementary grades. *Journal of Educational Psychology*, *104*(4), 879–896. https://doi.org/10.1037/a0029185

Griffin, C. (2004). The advantages and limitations of qualitative research in psychology and education. *Scientific Annals of the Psychological Society of Northern Greece*, *2*(1), 3-15.

Grosz, B. J., Joshi, A. K., & Weinstein, S. (1995). Centering: A framework for modelling the local coherence of discourse.

Halliday, M., & Matthiessen, C. (2013). *Halliday's Introduction to Functional Grammar* (4th ed.). Routledge.

Haukås, A. (2018). Metacognition in Language Learning and Teaching: An Overview. In A. Haukås, C. Bjørke, & M. Dypedahl (Eds.), *Metacognition in Language Learning and Teaching* (pp. 11–30). Routledge.

Hayes, J. R. (2012). What triggers revision? In L. Allal, L. Chanquoy, & P. Largy (Eds.), *Revision Cognitive and Instructional Processes* (pp. 9–20). Springer Publishing.

Hayes, J. R., & Flower, L. (2018). Identifying the organization of writing processes. In E. R. Steinberg & L. W. Gregg (Eds.), *Cognitive Processes in Writing (Psychology Library Editions: Cognitive Science)* (1st ed., pp. 3–30). Routledge.

Hinkel, E. (2003). *Teaching Academic ESL Writing: Practical Techniques in Vocabulary and Grammar (ESL & Applied Linguistics Professional Series)* (1st ed.). Routledge.

Holmes, A. G. D. (2020). Researcher Positionality - A Consideration of Its Influence and Place in Qualitative Research - A New Researcher Guide. *Shanlax International Journal of Education*, *8*(4), 1–10. https://doi.org/10.34293/education.v8i4.3232

Iruskieta, M., da Cunha, I., & Taboada, M. (2014). A qualitative comparison method for rhetorical structures: identifying different discourse structures in multilingual corpora. *Language Resources and Evaluation*, *49*(2), 263–309. https://doi.org/10.1007/s10579-014-9271-6

Jones, J. (2007). Losing and finding coherence in academic writing. *University of Sydney Papers in TESOL*, *2*(2), 125-148.

Kellogg, R. (2008). Training writing skills: A cognitive developmental perspective. *Journal of Writing Research*, *1*(1), 1–26. https://doi.org/10.17239/jowr-2008.01.01.1

Kellogg, R. T., & Whiteford, A. P. (2009). Training Advanced Writing Skills: The Case for Deliberate Practice. *Educational Psychologist*, *44*(4), 250–266. https://doi.org/10.1080/00461520903213600

Kong, A. P. H., Linnik, A., Law, S. P., & Shum, W. W. M. (2017). Measuring discourse coherence in anomic aphasia using Rhetorical Structure Theory. *International Journal of Speech-Language Pathology*, *20*(4), 406–421. https://doi.org/10.1080/17549507.2017.1293158

Lantolf, J. P., & Poehner, M. E. (2004). Dynamic assessment of L2 development: bringing the past into the future. *Journal of Applied Linguistics*, *1*(1), 49–72. https://doi.org/10.1558/japl.1.1.49.55872

Larkin, S. (2009). Socially mediated metacognition and learning to write. *Thinking Skills and Creativity*, *4*(3), 149–159. https://doi.org/10.1016/j.tsc.2009.09.003

Lee, I., & Mak, P. (2018). Metacognition and Metacognitive Instruction in Second Language Writing Classrooms. *TESOL Quarterly*, *52*(4), 1085–1097. https://doi.org/10.1002/tesq.436

Liu, X., & Furneaux, C. (2013). A multidimensional comparison of discourse organization in English and Chinese university students' argumentative writing. *International Journal of Applied Linguistics*, *24*(1), 74–96. https://doi.org/10.1111/ijal.12013

Lv, F., & Chen, H. (2010). A Study of Metacognitive-Strategies-Based Writing Instruction for Vocational College Students. *English Language Teaching*, *3*(3). https://doi.org/10.5539/elt.v3n3p136

MacArthur, C. A. (2012). Evaluation and Revision. In V. W. Berninger (Ed.), *Past, Present, and Future Contributions of Cognitive Writing Research to Cognitive Psychology* (1st ed., pp. 461–484). Psychology Press.

Mann, W. C., & Thompson, S. A. (1988). Rhetorical Structure Theory: Toward a functional theory of text organization. *Text - Interdisciplinary Journal for the Study of Discourse*, *8*(3). https://doi.org/10.1515/text.1.1988.8.3.243

Mann, W. C., & Thompson, S. A. (1992). *Discourse Description: Diverse linguistic analyses of a fund-raising text (Pragmatics & Beyond New Series)* (y First edition). John Benjamins Publishing Company.

Marcu, D. (1999). Instructions for manually annotating the discourse structures of texts. *Unpublished manuscript, USC/ISI*.

Marini, A., Boewe, A., Caltagirone, C., & Carlomagno, S. (2005). Age-related Differences in the Production of Textual Descriptions. *Journal of Psycholinguistic Research*, *34*(5), 439–463. https://doi.org/10.1007/s10936-005-6203-z

Nguyen, L. T. C., & Gu, Y. (2013). Strategy-based instruction: A learner-focused approach to developing learner autonomy. *Language Teaching Research*, *17*(1), 9–30. https://doi.org/10.1177/1362168812457528

O'Brien, T. (1995). Rhetorical Structure Analysis and the Case of the Inaccurate, Incoherent Source-hopper. *Applied Linguistics*, *16*(4), 442–482. https://doi.org/10.1093/applin/16.4.442

Öz, H. (2016). Metacognitive awareness and academic motivation: A cross-sectional study in teacher education context of Turkey. *Procedia-Social and Behavioral Sciences*, *232*, 109-121.

Pacello, J. (2018). Cultivating a Process Approach to Writing: Student Experiences in a Developmental Course. *Journal of the Scholarship of Teaching and Learning*, *19*(2). https://doi.org/10.14434/josotl.v19i1.23786

Panahandeh, E., & Asl, S. E. (2014). The Effect of Planning and Monitoring as Metacognitive Strategies on Iranian EFL Learners' Argumentative Writing Accuracy. *Procedia - Social and Behavioral Sciences*, *98*, 1409–1416. https://doi.org/10.1016/j.sbspro.2014.03.559

Pateman, T., Sperber, D., & Wilson, D. (1986). Relevance, Contextual Effects and Least Effort. *Poetics Today*, *7*(4), 745. https://doi.org/10.2307/1772937

Pelsmaekers, K., Braecke, C., & Geluykens, R. (1998). Rhetorical relations and subordination in L2 writing. In A. Sánchez-Macarro & R. Carter (Eds.), *Linguistic Choice across Genres: Variation in spoken and written English (Current Issues in Linguistic Theory)* (pp. 191–213). John Benjamins Publishing Company.

Pelsmaekers, K., Braecke, C., & Geluykens, R. (1998). Rhetorical relations and subordination in L2 writing. In A. Sánchez-Macarro & R. Carter (Eds.), *Linguistic Choice across*

Genres: Variation in spoken and written English (Current Issues in Linguistic Theory) (pp. 191–213). John Benjamins Publishing Company.

Peng, G. (2009). Using Rhetorical Structure Theory (RST) to describe the development of coherence in interpreting trainees. *China and Chinese*, *11*(2), 216–243. https://doi.org/10.1075/intp.11.2.06pen

Perry, J., Lundie, D., & Golder, G. (2018). Metacognition in schools: what does the literature suggest about the effectiveness of teaching metacognition in schools? *Educational Review*, *71*(4), 483–500. https://doi.org/10.1080/00131911.2018.1441127

Raoofi, S., Heng Chan, S., Mukundan, J., & Md Rashid, S. (2013). Metacognition and Second/Foreign Language Learning. *English Language Teaching*, *7*(1). https://doi.org/10.5539/elt.v7n1p36

Rhetorical Structure Theory. (2005). RST Rhetorical Structure Theory. http://www.sfu.ca/rst/

Schoonen, R., Gelderen, A. V., Glopper, K. D., Hulstijn, J., Simis, A., Snellings, P., & Stevenson, M. (2003). First Language and Second Language Writing: The Role of Linguistic Knowledge, Speed of Processing, and Metacognitive Knowledge. *Language Learning*, *53*(1), 165–202. https://doi.org/10.1111/1467-9922.00213

Schraw, G., Crippen, K. J., & Hartley, K. (2006). Promoting Self-Regulation in Science Education: Metacognition as Part of a Broader Perspective on Learning. *Research in Science Education*, *36*(1–2), 111–139. https://doi.org/10.1007/s11165-005-3917-8

Shintani, N. (2015). The effects of computer-mediated synchronous and asynchronous direct corrective feedback on writing: a case study. *Computer Assisted Language Learning*, *29*(3), 517–538. https://doi.org/10.1080/09588221.2014.993400

Skoufaki, S. (2009). An exploratory application of rhetorical structure theory to detect coherence errors in L2 English writing: Possible implications for automated writing evaluation software. *International Journal of Computational Linguistics & Chinese Language Processing: Special issue in Computer Assisted Language Learning*, *14*(2), 181-203.

Skoufaki, S. (2020). Rhetorical Structure Theory and coherence break identification. *Text & Talk*, *40*(1), 99–124. https://doi.org/10.1515/text-2019-2050

Sum, W. W. (2014). Measuring the coherence of healthy and aphasic discourse production in Chinese using Rhetorical Structure Theory (RST). *Frontiers in Psychology*, *5*. https://doi.org/10.3389/conf.fpsyg.2014.64.00028

Taboada, M., & Mann, W. C. (2006a). Applications of Rhetorical Structure Theory. *Discourse Studies*, *8*(4), 567–588. https://doi.org/10.1177/1461445606064836

Taboada, M., & Mann, W. C. (2006b). Rhetorical Structure Theory: looking back and moving ahead. *Discourse Studies*, *8*(3), 423–459. https://doi.org/10.1177/1461445606061881

Teng, F. (2016). Immediate and delayed effects of embedded metacognitive instruction on Chinese EFL students' English writing and regulation of cognition. *Thinking Skills and Creativity*, *22*, 289–302. https://doi.org/10.1016/j.tsc.2016.06.005

Teng, M. F. (2019a). Tertiary-Level Students' English Writing Performance and Metacognitive Awareness: A Group Metacognitive Support Perspective. *Scandinavian Journal of Educational Research*, *64*(4), 551–568. https://doi.org/10.1080/00313831.2019.1595712

Teng, M. F. (2019b). The role of metacognitive knowledge and regulation in mediating university EFL learners' writing performance. *Innovation in Language Learning and Teaching*, *14*(5), 436–450. https://doi.org/10.1080/17501229.2019.1615493

Traxler, M. J., & Gernsbacher, M. A. (1995). Improving coherence in written communication. *Coherence in spontaneous text*, 215-238.

Tsiriotakis, I. K., Grünke, M., Spantidakis, I., Vassilaki, E., & Stavrou, N. A. M. (2020). The Impact of an Explicit Writing Intervention on EFL Students' Short Story Writing. *Frontiers in Education*, *5*. https://doi.org/10.3389/feduc.2020.565213

Wang, Y., & Guo, M. (2014). A Short Analysis of Discourse Coherence. *Journal of Language Teaching and Research*, *5*(2). https://doi.org/10.4304/jltr.5.2.460-465

Wang, Y., Harrington, M., & White, P. (2012). Detecting breakdowns in local coherence in the writing of Chinese English learners. *Journal of Computer Assisted Learning*, *28*(4), 396–410. https://doi.org/10.1111/j.1365-2729.2011.00475.x

Wang, Z., & Han, F. (2017). Metacognitive Knowledge and Metacognitive Control of Writing Strategy between High- and Low-performing Chinese EFL Writers. *Theory and Practice in Language Studies*, *7*(7), 523. https://doi.org/10.17507/tpls.0707.04

Wenden, A. L. (1991). Metacognitive strategies in L2 writing: A case for task knowledge. In J. E. Alatis (Ed.), *Linguistics and language pedagogy: The state of the art* (pp. 302–322). Georgetown University Press,.

Wischgoll, A. (2016). Combined Training of One Cognitive and One Metacognitive Strategy Improves Academic Writing Skills. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.00187

Yin, R. K. (2017). *Case Study Research and Applications: Design and Methods* (6th ed.). SAGE Publications, Inc.

Zhao, C. G., & Liao, L. (2021). Metacognitive strategy use in L2 writing assessment. *System*, *98*, 102472. https://doi.org/10.1016/j.system.2021.102472

APPENDIX

Appendix 1: Scheme for Assessing Global Structure in Writings (Adapted from O'Brien, 1995)

Please indicate your evaluation of the essay by scoring specific criteria listed below with a scale from 1 to 5.

A score of "5" indicates that the writing fully satisfies the criterion.

A score of "4" indicates that the writing satisfies the criterion with occasional errors.

A score of "3" indicates that the writing fairly satisfies the criterion with some errors.

A score of "2" indicates that the writing fairly satisfies the criterion with frequent errors.

A score of "1" indicates that the writing completely fails to meet the criterion.

Criterion	Score
1. The essay has an introduction which clearly states the context for the topic, including time, place and circumstance as necessary.	
2. The thesis statement in the introduction clearly states purpose and/or orientates the reader in terms of content.	
3. The body paragraphs are related to the thesis of the essay/contribute to a single idea or thesis stated in the introduction.	
4. Each paragraph discusses a separate aspect of the topic/Ideas discussed in different body paragraphs do not overlap with each other.	
5. Each topic sentence fully clearly states the purpose or idea to be elaborated on in the paragraph.	
6. The remaining section of each paragraph clarifies or supports the idea stated in the topic sentence with relevant reasoning, evidence and/or example.	
7. The sentences in each paragraph follow each other logically. The reader can follow the relationship between sentences easily.	

8. The conclusion successfully recaps the path of the discussion in the essay without introducing new and unrelated information.	
Total score	

Appendix 2: List of 13 Relations Adopted in this Study

No.	Name of relation in this study	Name of original relations	Definition
1.	**LIST**	**LIST**	the major units are a series of ideas that have the same function or purpose. Discourse markers: - Firstly, Secondly, Furthermore, Moreover, Also, … - and Examples: *[There are two main reasons why parents should limit the use of mobile phone by their children.[1]] [**Firstly**, using mobile phone too much can take up the time for other activities such as studying.[2]] [**Secondly**, it also negatively affects their health, particularly eyesight.[3]]* *[The government should limit the number of private vehicles in city centers[1]] [in order to reduce air pollution[2]] [**and** solve traffic jams.[3]]*
2.	**EXPLANATION**	**ELABORATION** **EXAMPLE** **EVIDENCE** **RESTATEMENT**	the minor unit: - provides additional detail for the information in the major unit - provides an example for the information in the major unit - provides evidence or data to illustrate the information in the major unit - restates the information in the major unit in a different way

			Discourse markers: - Specifically, In detail, In fact, - For example, For instance, - In other words Examples: *[Women are suffering from gender inequality[1]] [due to the traditional way of thinking.[2]] [**Specifically**, many people do not encourage women to study, especially in higher education.[3]] [Also, these people still think that women should only be at home[4]] [and take care of the family.[5]]* *[Women are still suffering from gender inequality in many aspects.[1]] [**For example**, in terms of education,[2]] [many girls have not been able to study at schools in some countries.[4]]* *[Women are still suffering from gender inequality in the workplace.[1]] [In 2013, only 47.1% of women are employed[2]] [while the figure for men is 72.2%.[3]]* - *[Women are still suffering from gender inequality in many aspects.[1]] [**In other words**, they have not received the same treatment as men.[2]]*
3.	**COMPARISON**	**COMPARISON**	the differences and similarities between the situations in minor and major clauses are shown. Discourse markers: - Than, more, less - Similarly, Likewise

			Examples: *[Recycling is a possible way[1]] [to protect the environment.[2]] [**Similarly**, saving energy such as electricity and water is equally important for this purpose.[3]]* *[Visiting museums might be **more** effective[1]] [**than** just reading textbooks[2]] [to learn about the past.[3]]*
4.	**RESULT**	**RESULT** **CONSEQUENCE**	the situation in the major unit is the effect or consequence of the situation in the minor unit. Discourse markers: - As a result, Therefore, So, - Lead to, result in, bring about Examples: *[People are now destroying forests globally.[1]] [**As a result**, many animals have lost their natural habitat.[2]]* *[People nowadays are very busy in their work,[1]] [which **leads to** the lack of time for relaxation.[2]]*
5.	**REASON**	**REASON** **CAUSE**	the situation in the minor unit explains why the situation in the major unit occurs. Discourse markers: - Because, since, as - Due to, because of

			Examples: ***[Because** healthcare costs are so high,[1]] [many citizens do not have the chance to be treated.[2]]* ***[Due to** COVID-19 pandemic,[1]] [many businesses have been closed down.[2]]*
6.	**PURPOSE**	**PURPOSE**	the situation in the minor unit is the aim or goal of the situation in the major unit. Discourse markers: - To, in order to, so as to - So that Examples: *[People sometimes consume fast food[1]] [**to** save time.[2]]* ***[In order to** solve environmental problems,[1]] [all nations in the world need to cooperate with each other.[2]]*
7.	**MEANS**	**MEANS** **MANNER**	the situation in the minor unit explains how the situation in the main clause happens or is done. Discourse markers: by, by means of, with the help of, … Examples: ***[With the help of** the Internet,[1]] [people nowadays can work from home.[2]]*

			***[Thanks to** studying in university,[1]] [students can further gain work-related knowledge and skills.[2]]*
8.	**CONTRAST**	**CONTRAST** **ANTITHESIS** **CONCESSION**	the situation in the main clause is the opposite (usually in a surprising way) to the situation in the minor clause or to the expectation of the readers. Discourse markers: - Although, though - While, whereas, whilst - In contrast, but Examples: ***[Although** there have been many efforts in protecting the environment,[1]] [the situation is still very serious.[2]]* *[Some people believe that university is the only way to achieve success,[1]] [**but** I do not agree.[2]]*
9.	**PROBLEM – SOLUTION**	**PROBLEM – SOLUTION**	the situation in the minor clause is a thing that is difficult and needs to be dealt with while the situation in the major clause is the answer or response to the situation in the minor unit Discourse markers: should, need to Examples: *[The current situation of deforestation is very serious.1] [The government should pass stricter laws that protect the forests.2]*

			[Nowadays, genetically modified food (GM food) has become very popular.1] [This trend has resulted in a heated debate over the advantages and disadvantages of consuming this kind of food.2] [Personally, I think that GM food brings more benefits for humans than drawbacks.3]
10.	**CONDITION**	**CONDITION** **CONTINGENCY**	the situation in the minor clause needs to be completed for the situation in the major clause to happen. Discourse markers: If Examples: ***[If** Internet users are more careful in selecting sources to read,[1]] [they can avoid some inappropriate information.[2]]*
11.	**EVALUATION**	**EVALUATION**	the information in the major unit is the writer's opinion or assessment of the situation in the minor unit. Discourse markers: I think, I believe, … Examples: *[Regardless of age,[1]] [we can all enjoy a memorable melody or a beautiful singing voice,[2]] [and the best songs seem to have affect our mood in the same way.[3]] [This would explain[4]] [why televised music competitions, such as 'The X Factor' or 'The Voice', are such popular prime-time shows.[5]] [These programs attract incredibly broad audiences[6]] [because singing and popular songs appeal to children, parents and grandparents alike.[7]] [**I would argue that**[8]**]** [no other form of entertainment can bring families together in this way.[9]]*

			*[The lack of human contact in the home is replaced by television, video games, online chat rooms or Internet surfing.[1]] [This type of existence is associated with boredom, loneliness, and feelings of isolation or even alienation,[2]] [and **I think[3]]** [these factors may increase the risk of mental illness.[4]]*
12.	**SUMMARY**	**SUMMARY**	the information in the minor unit expresses the main points of the information in the major unit. The minor unit is shorter than the major unit. Discourse markers: In short, In conclusion, In summary, … Examples: *[Genetic engineering could be the solution to famine in developing countries[1]], [if crops can be grown more reliably in harsh conditions.[2]] [Also, scientists may use genetic engineering[3]] [to produce vaccines,[4]] [to cure diseases,[5]] [or to correct a genetic defect[6]]. [If it is properly regulated,[7]] [even cloning can be done[8]] [in a way that improves lives[9]]. [For example, the cloning of individual organs, such as a heart or kidney, could be permitted for transplant purposes.[10]] [**In conclusion**, I am convinced that genetic engineering will have a positive impact on our lives.[11]]*
13.	**BACKGROUND**	**BACKGROUND** **CIRCUMSTANCE**	the information in the minor unit provides information about time, place or people that makes it easier for the major unit to be understood. The information in the minor unit is not the cause or reason for the information in the major unit. Discourse markers: In this age of …, In recent years, …, Nowadays, …

			Examples: *[Nowadays, Internet has become a popular all around the world[1]] [and everyone can easily make friends online.[2]] [Some people are worried[3]] [that this trend might bring about dangerous situations for Internet users.[4]]* *[It is true that cities are seeing a rise in smaller families and one-person households,[1]] [while the extended family is becoming a rarity.[2]] [Some people think that this situation is negative.[3]]*

Appendix 3: Feedback Scheme (adapted from Aljaafreh and Lantolf, 1994).

1. The researcher asked the participant to read his writing aloud and try to identify the errors related to global coherence.
2. When the participant failed to recognize the error, the researcher indicated that there might be some problems – *"Is there anything incoherent?"*
3. When the participant failed to recognize the error, the researcher rejected his or her unsuccessful attempt.
4. The researcher specifically indicated the location of error – *"Is there anything incoherent in this section?"*
5. When the participant failed to recognize the error, the researcher rejected his or her unsuccessful attempt.
6. The researcher asked some guiding questions such as *"What's the purpose of this sentence?"/"How does this sentence explain or illustrate the main point?"*
7. When the participant failed to recognize the error, the researcher rejected his or her unsuccessful attempt.
8. The researcher explicitly indicated and explained the nature of error to the participant.

Appendix 4: Coherence Breaks in Ahmadi and Parhizgar (2017)

Name of the coherence errors	Definition
irrelevant content	parts of a text refers to something that is significantly far from the main content of the whole text.
violation of completedness	the entire text does not fit into a single schema.
violation of connectedness	a text span does not have any relation with other text spans.
incorrect place	a specific unit in the form of a single clause or a text span appears in a place where it is not allowed to.
incorrect relation	a writer relates two parts of the text with a wrong relation.

crossed dependency	when a satellite is connected to a nucleus, it my cross or interfere with the previous text span.
scattered units	sub-parts of two or more spans of text intermingle and establish a scattered set of diagrams

Appendix 5: Coherence Breaks in Skoufaki (2020)

Name of the coherence errors	Definition
completedness/connectedness violation	dangling schema due to topic-irrelevant content
	dangling unit due to topic-irrelevant content
uniqueness violation	relation between units which belong to different schemas
adjacency violation	relation between schemas which have another schema intervening

Appendix 6: RST Trees of the Pretest and Posttest Essays

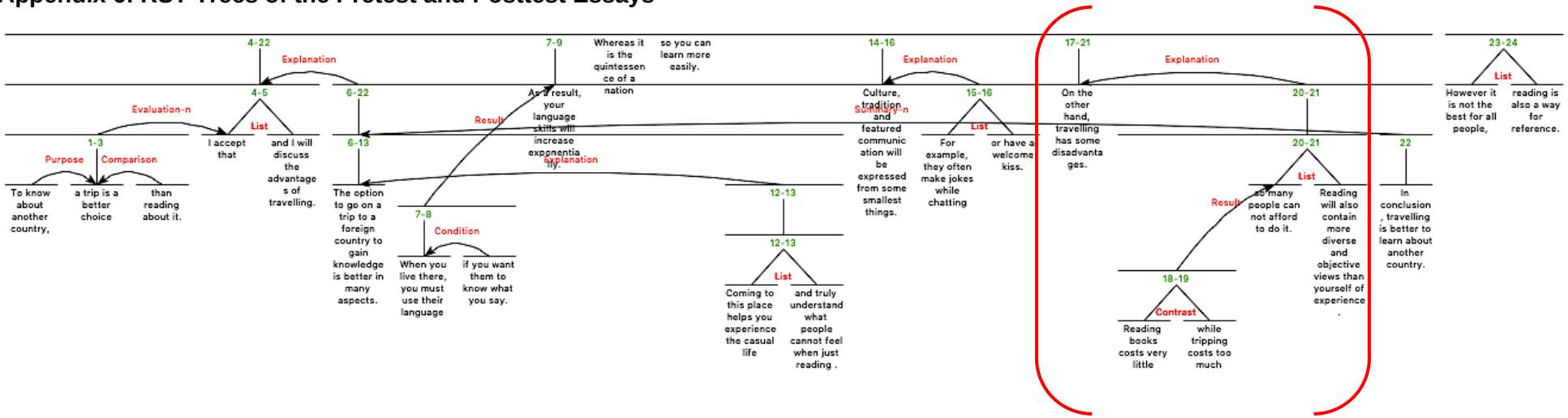

Figure 4.1: Incoherence between thesis statement and body part in Pre-E

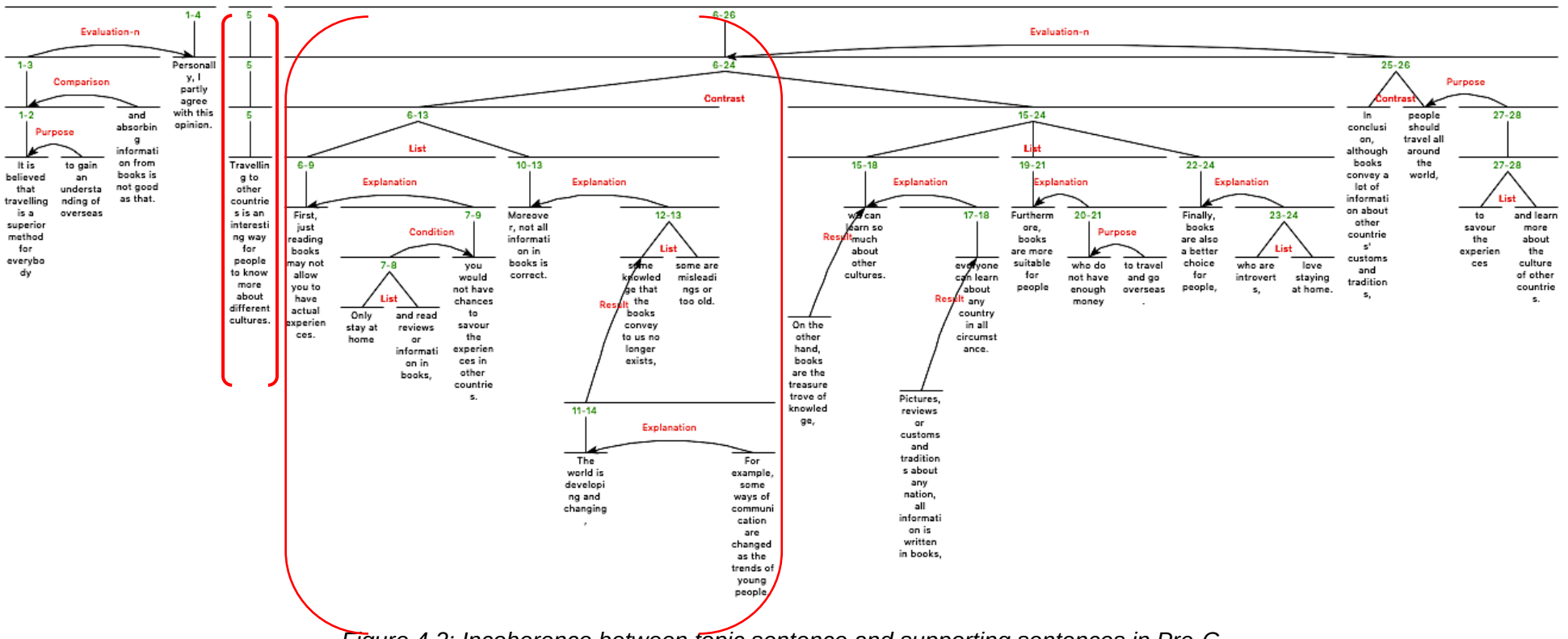

Figure 4.2: Incoherence between topic sentence and supporting sentences in Pre-C

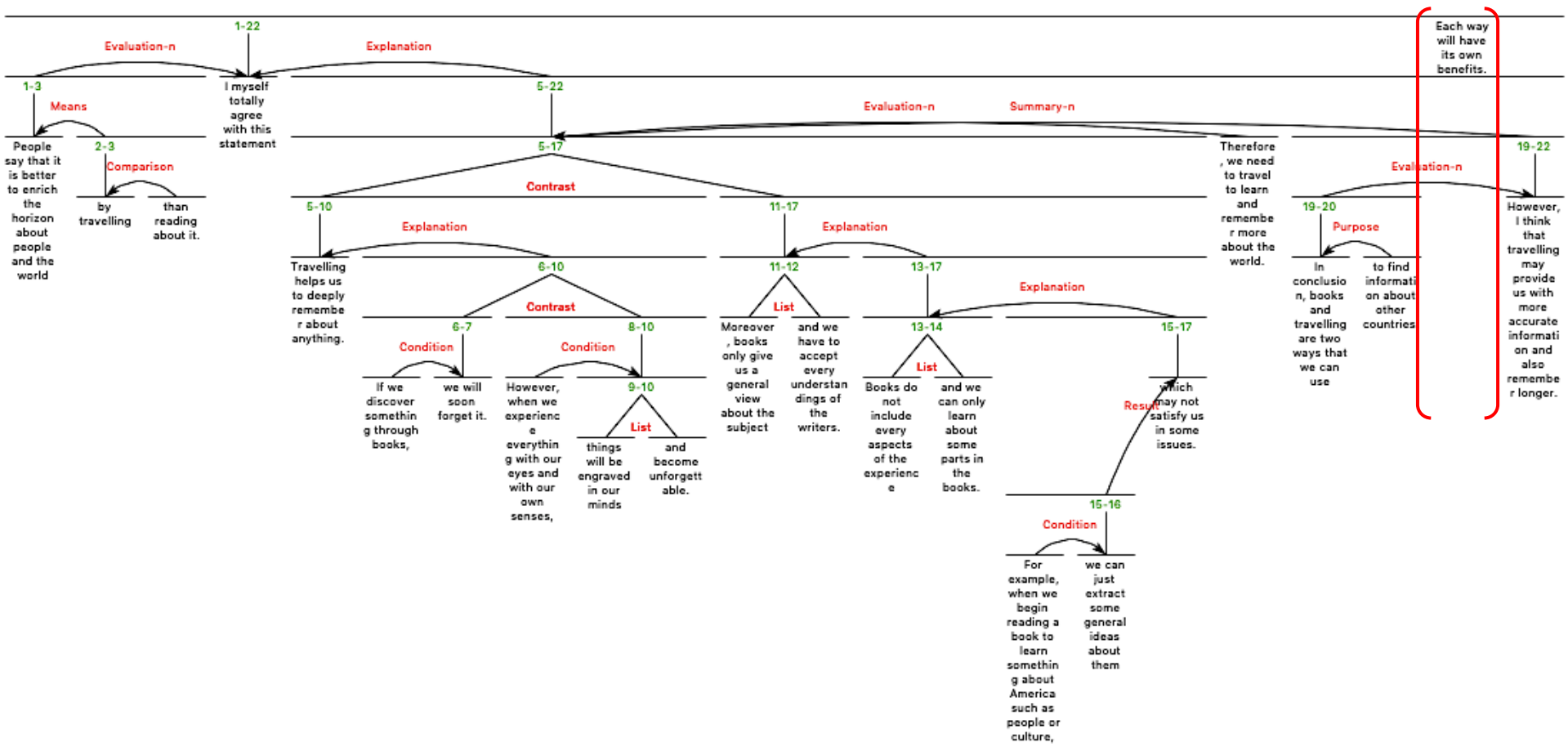

Figure 4.3: Incoherence between conclusion and body part in Pre-B

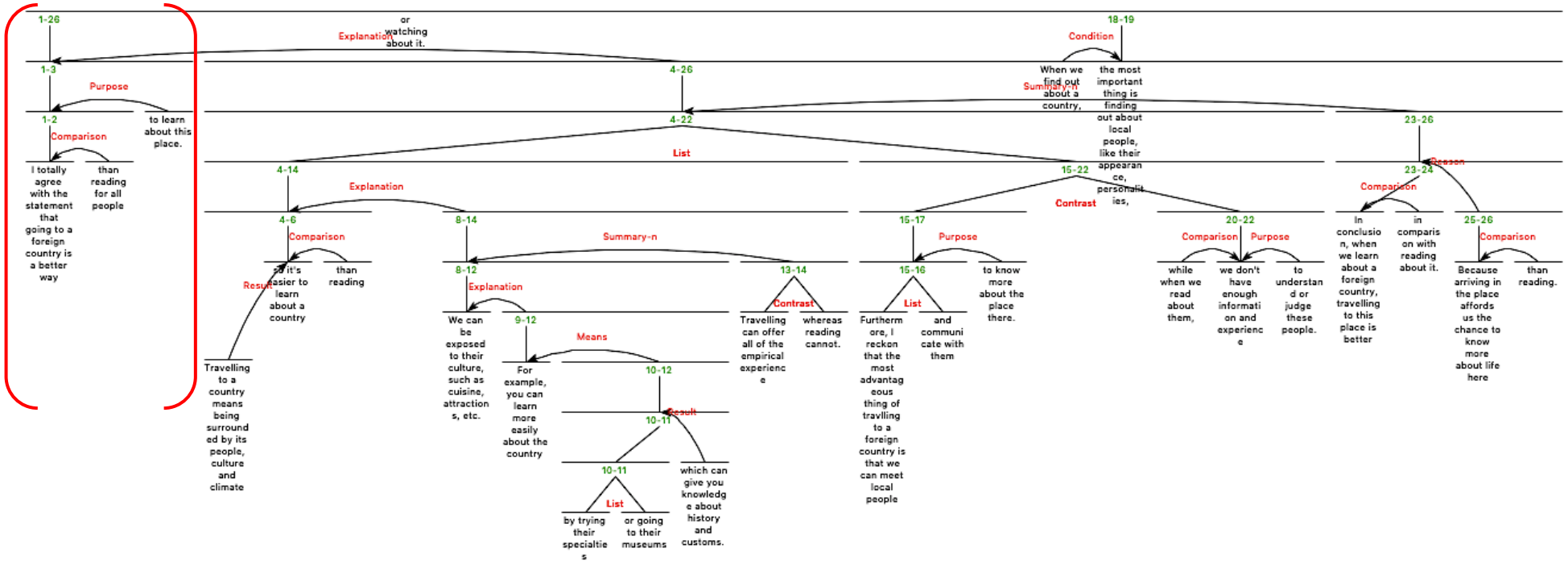

Figure 4.4: Incorrect place of background in Pre-A

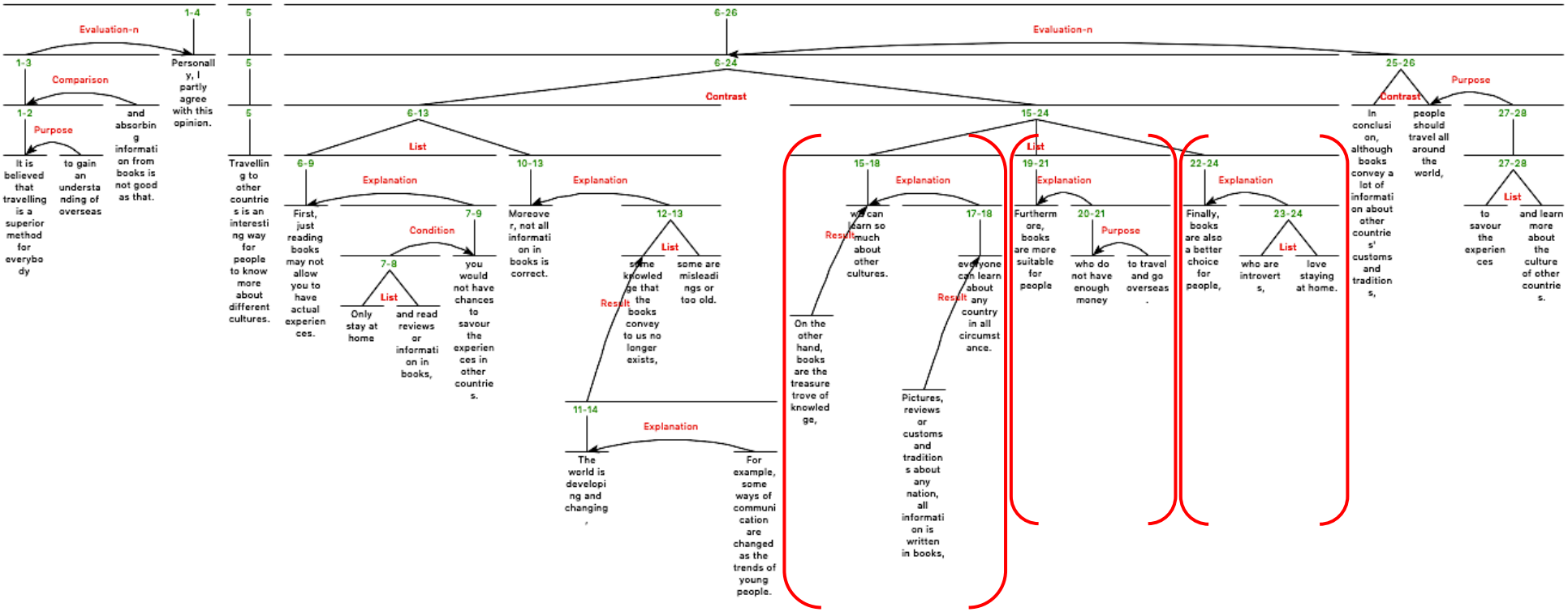

Figure 4.5: Incorrect place of topic sentence in Pre-C

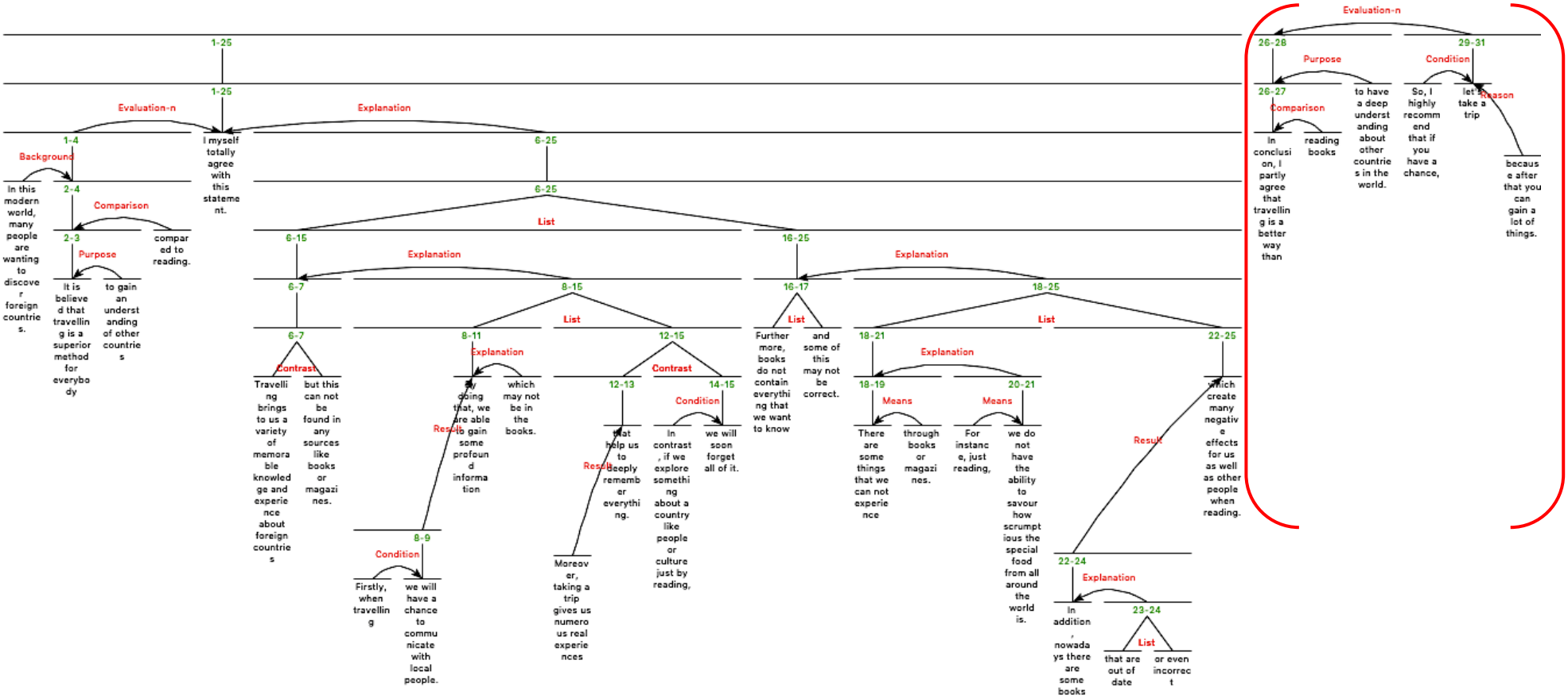

Figure 4.6: Incoherence between conclusion and body part in Post-1B

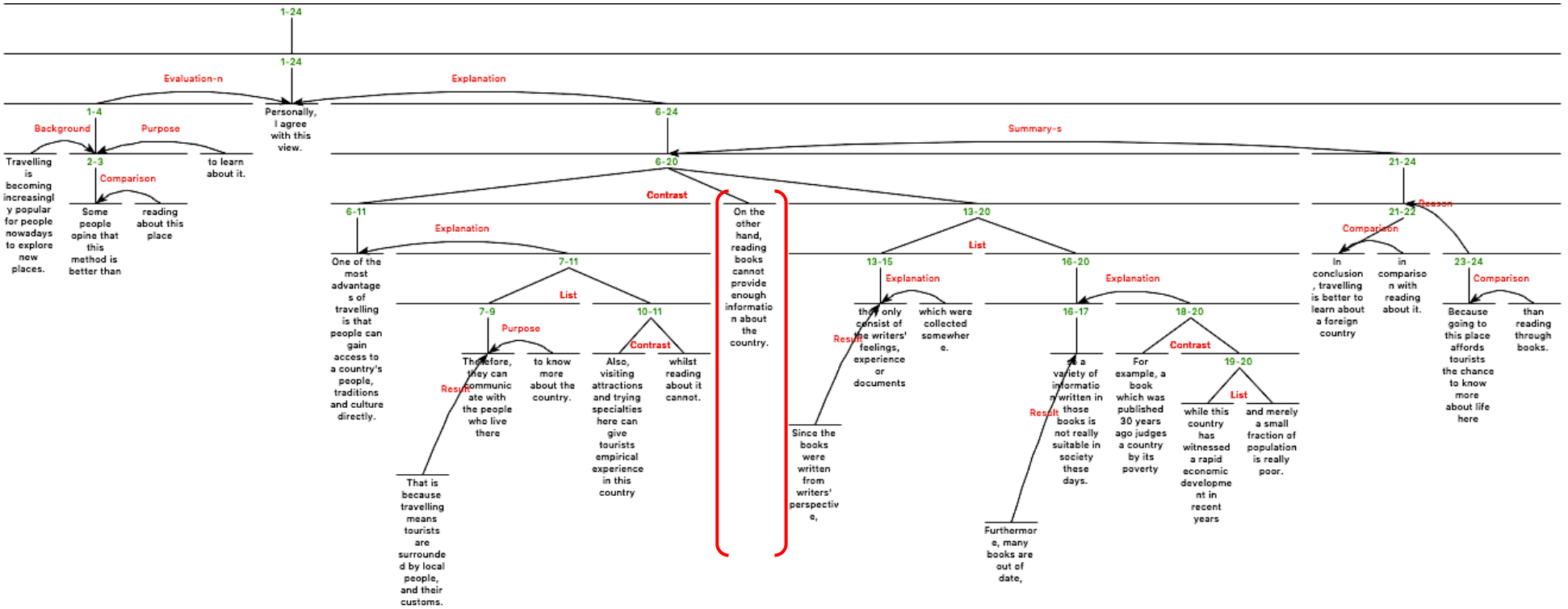

Figure 4.7: Incoherence between topic sentence and supporting sentences in Post-1A

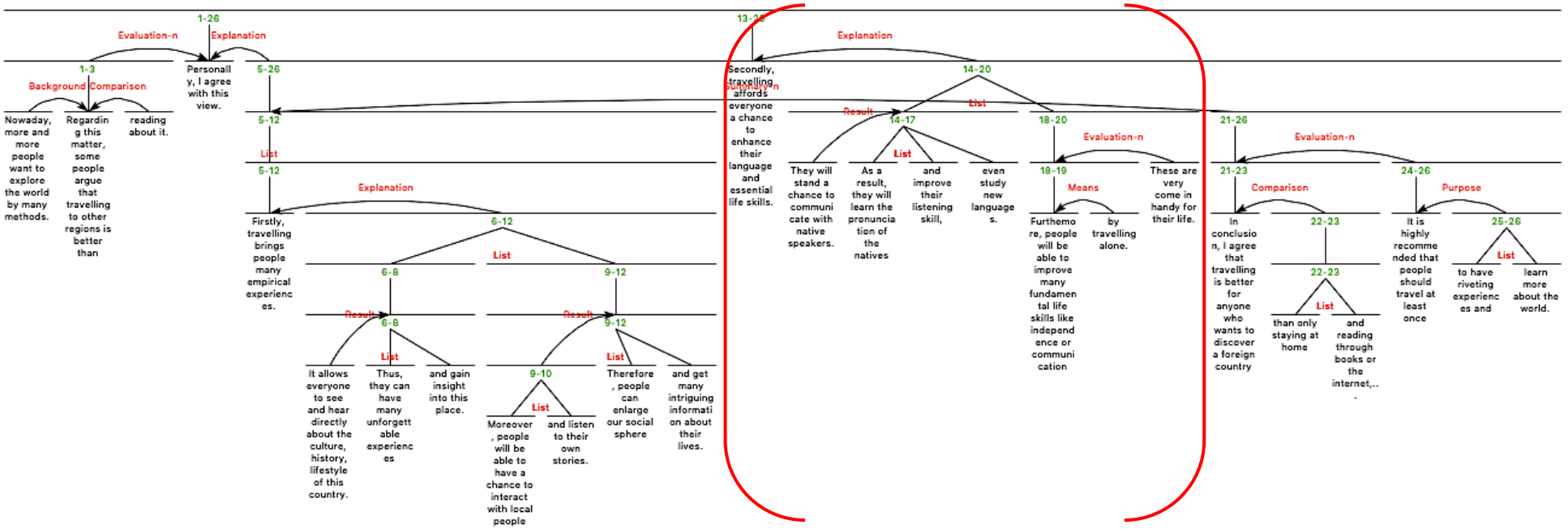

Figure 4.8: Incoherence between thesis statement and body part in Post-1D

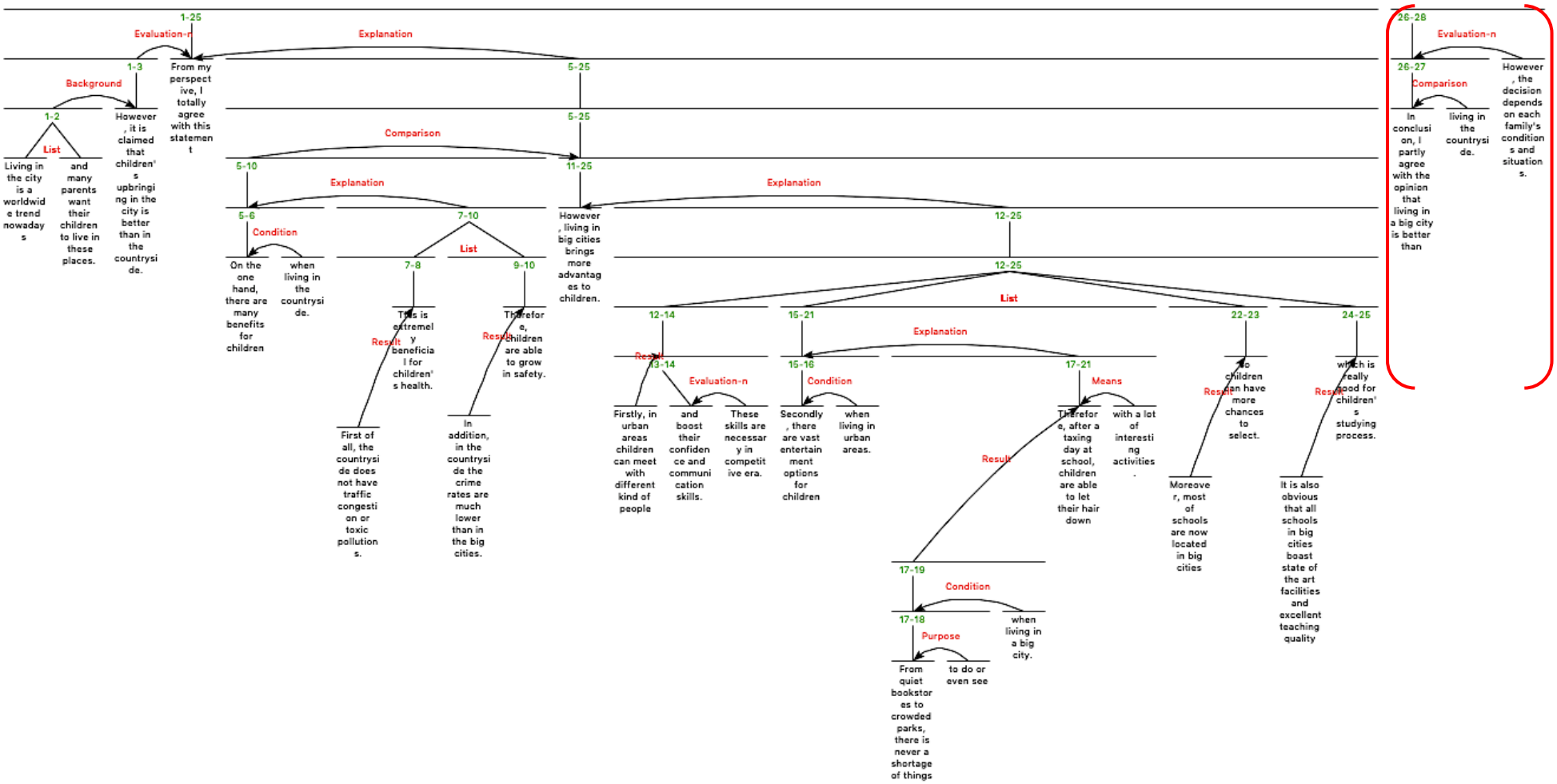

Figure 4.9: Incoherence between conclusion and body part in Post-2B

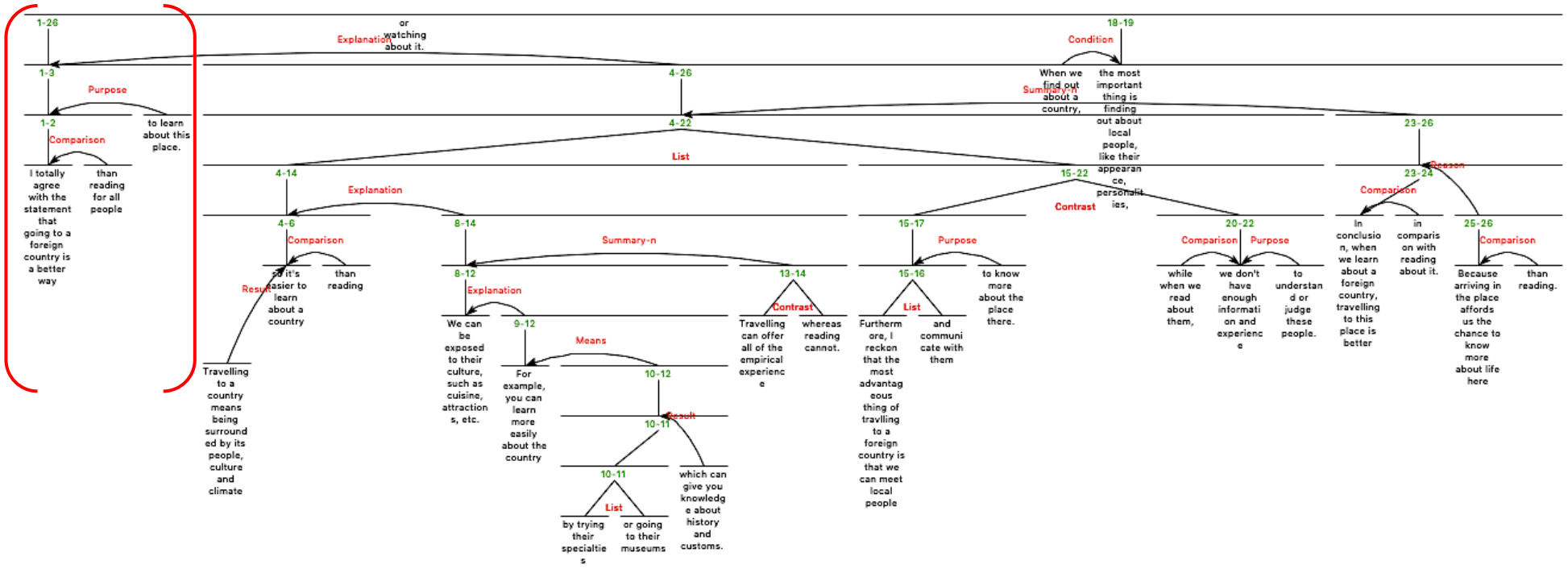

Figure 4.10: Incorrect place of background in Pre-A

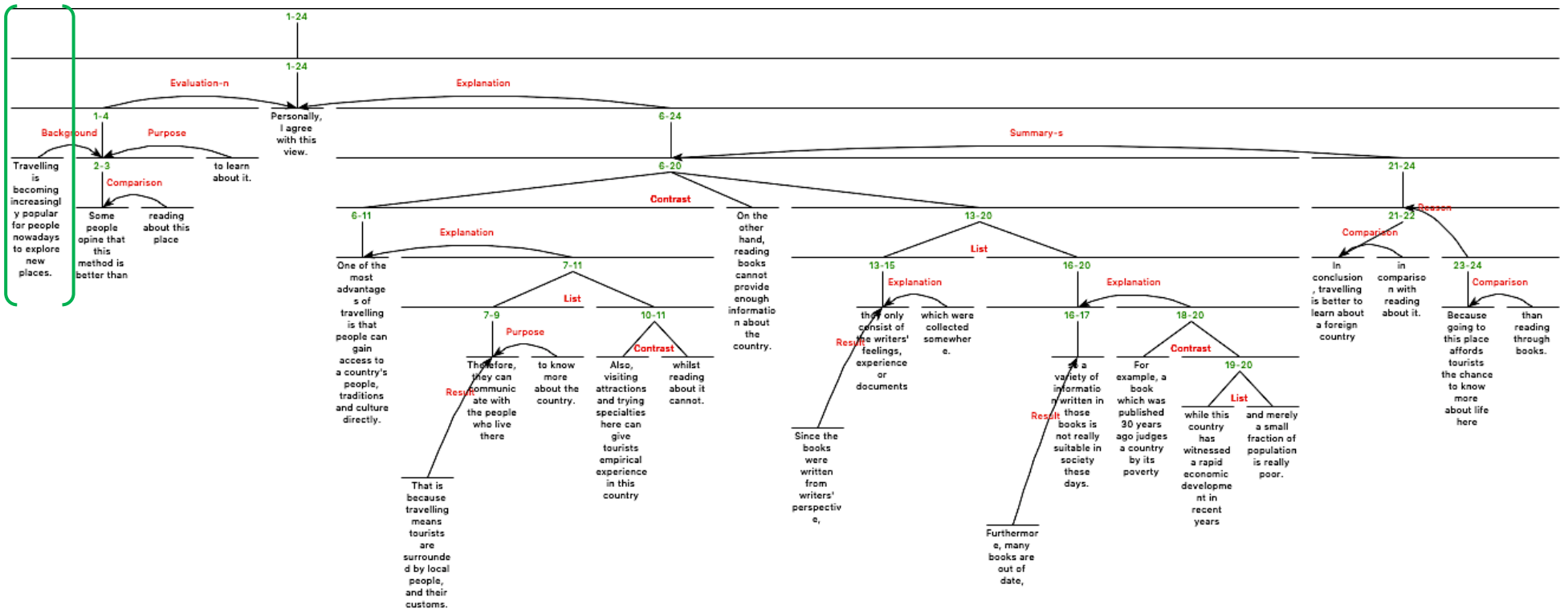

Figure 4.11: Correct place of background in Post-1A

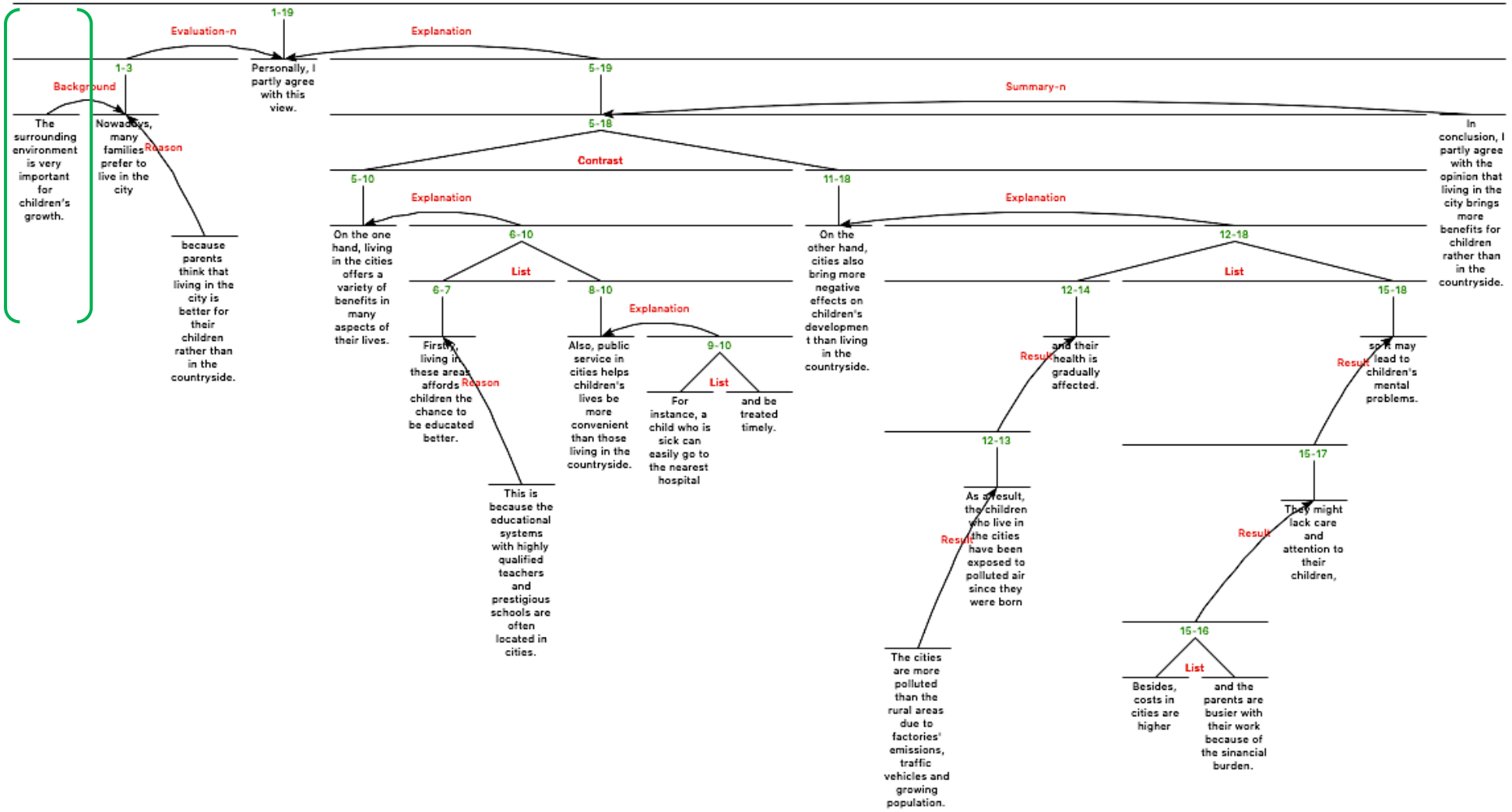

Figure 4.12: Correct place of background in Post-2A

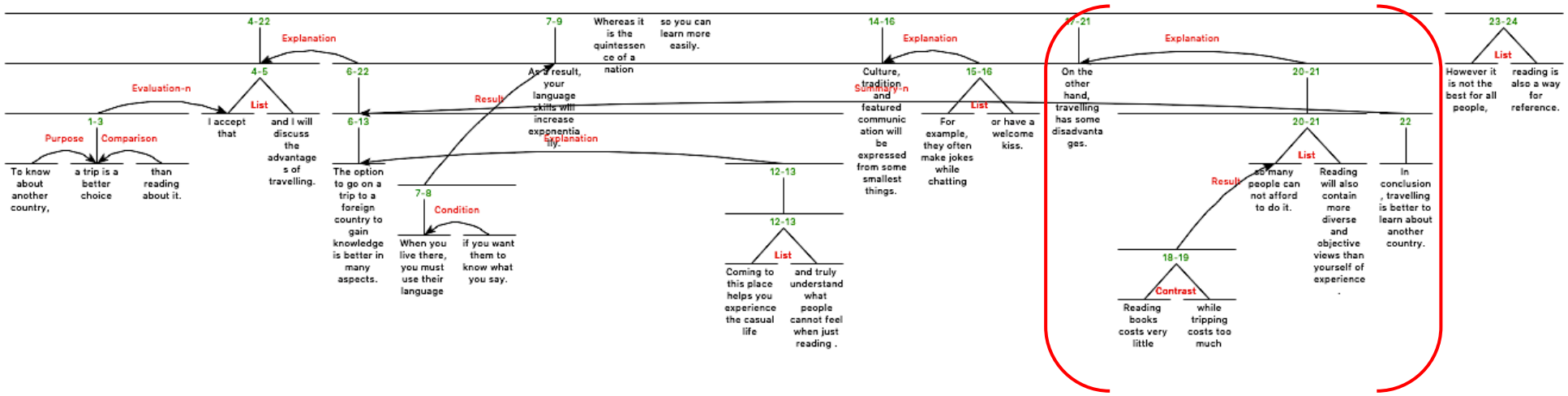

Figure 4.13: Incoherence between thesis statement and body part in Pre-E

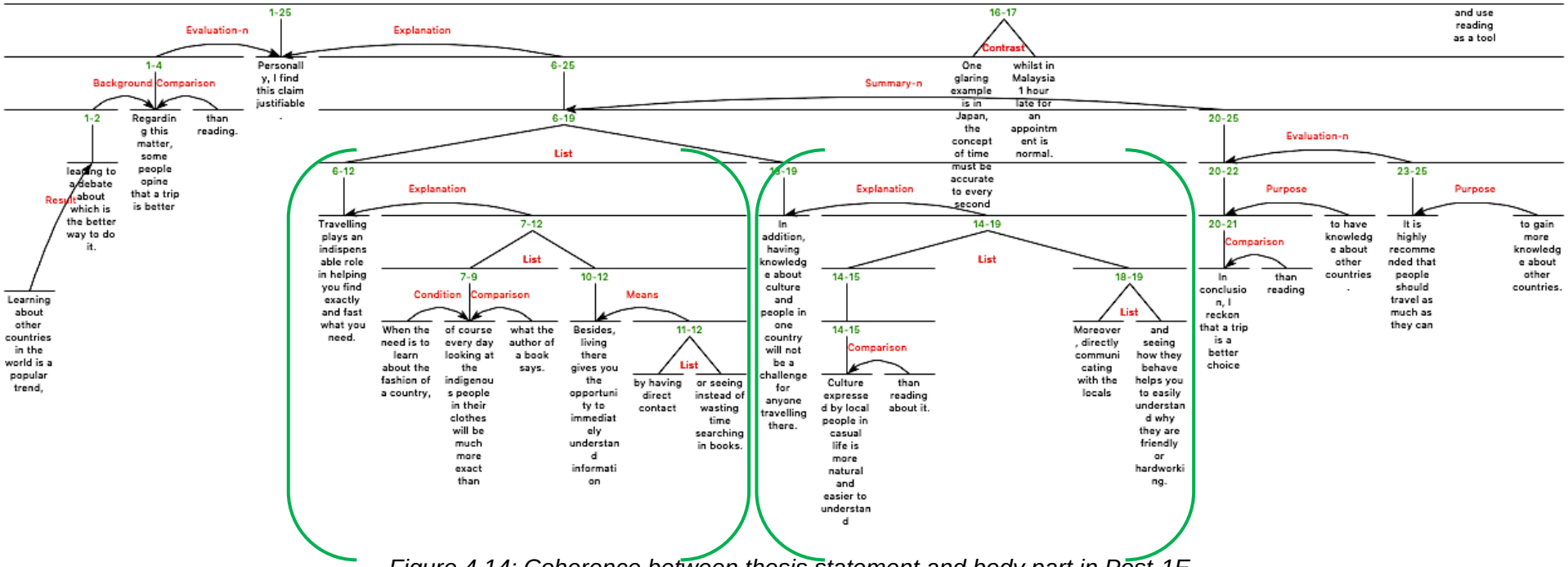

Figure 4.14: Coherence between thesis statement and body part in Post-1E

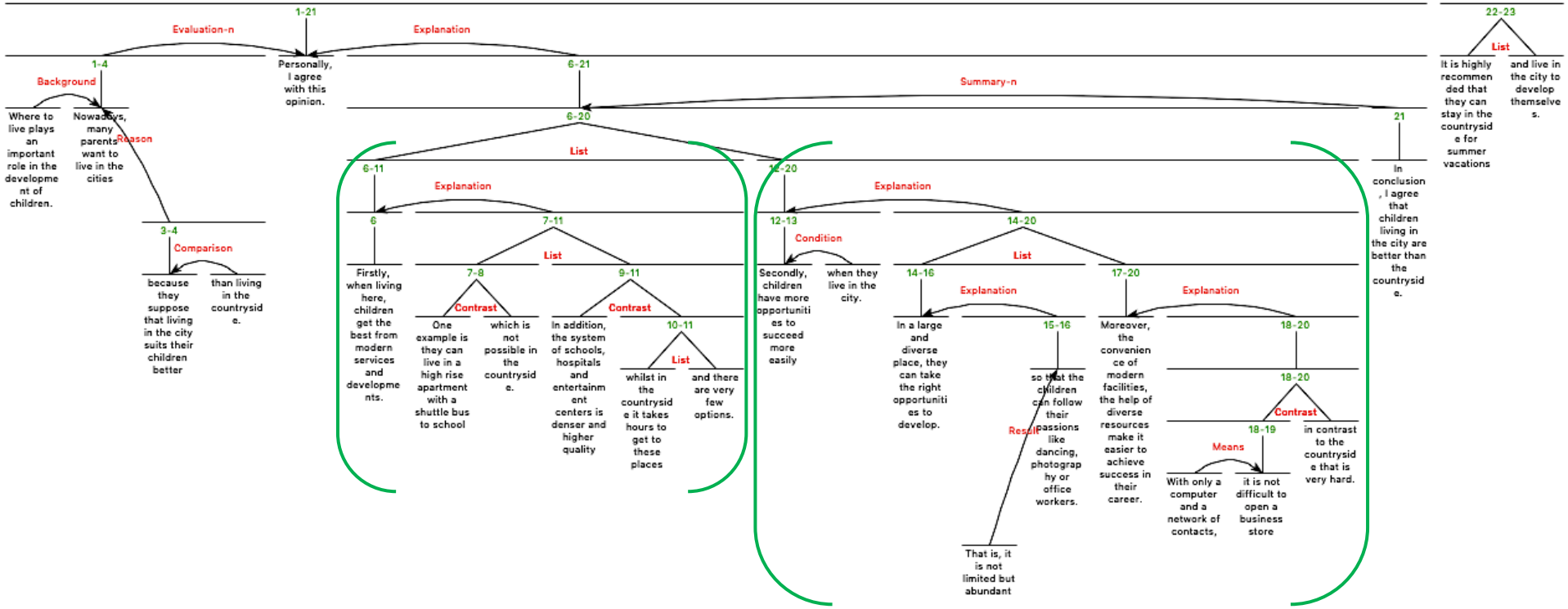

Figure 4.15: Coherence between thesis statement and body part in Post-2E

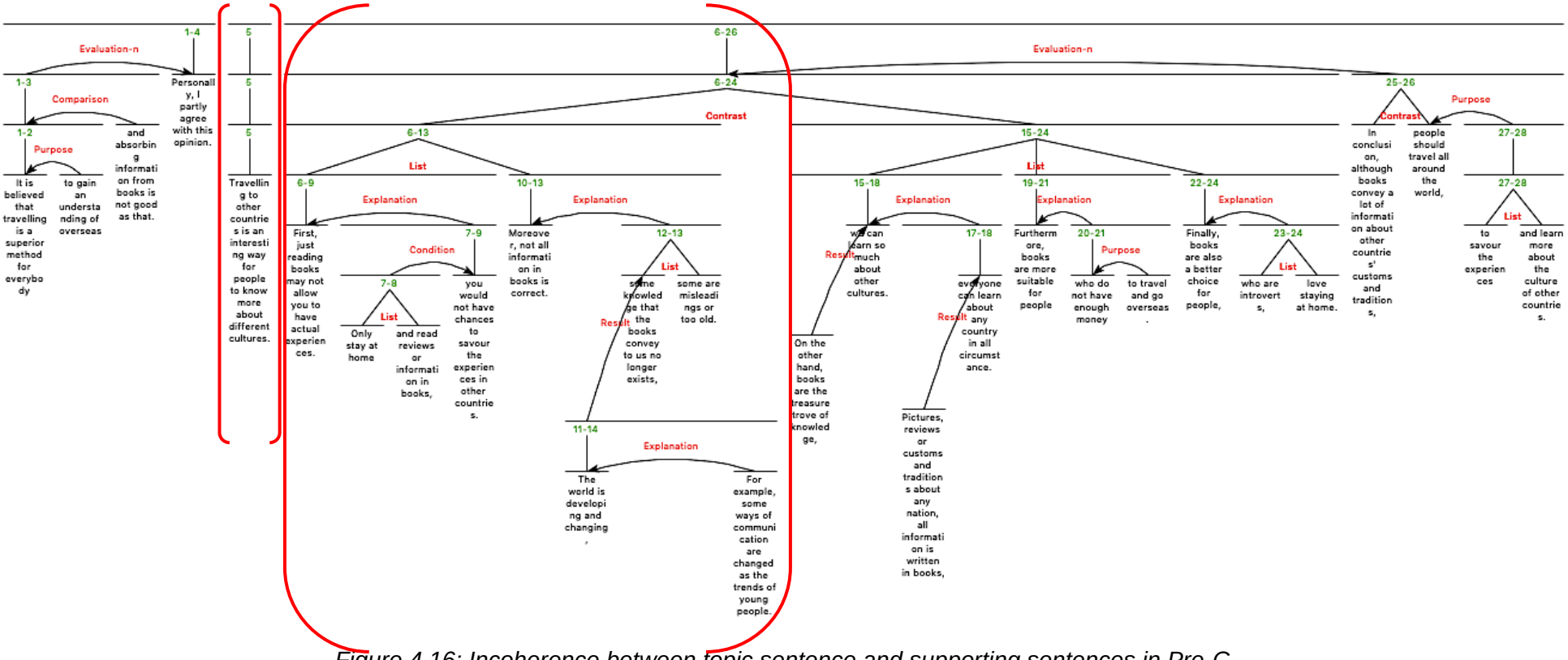

Figure 4.16: Incoherence between topic sentence and supporting sentences in Pre-C

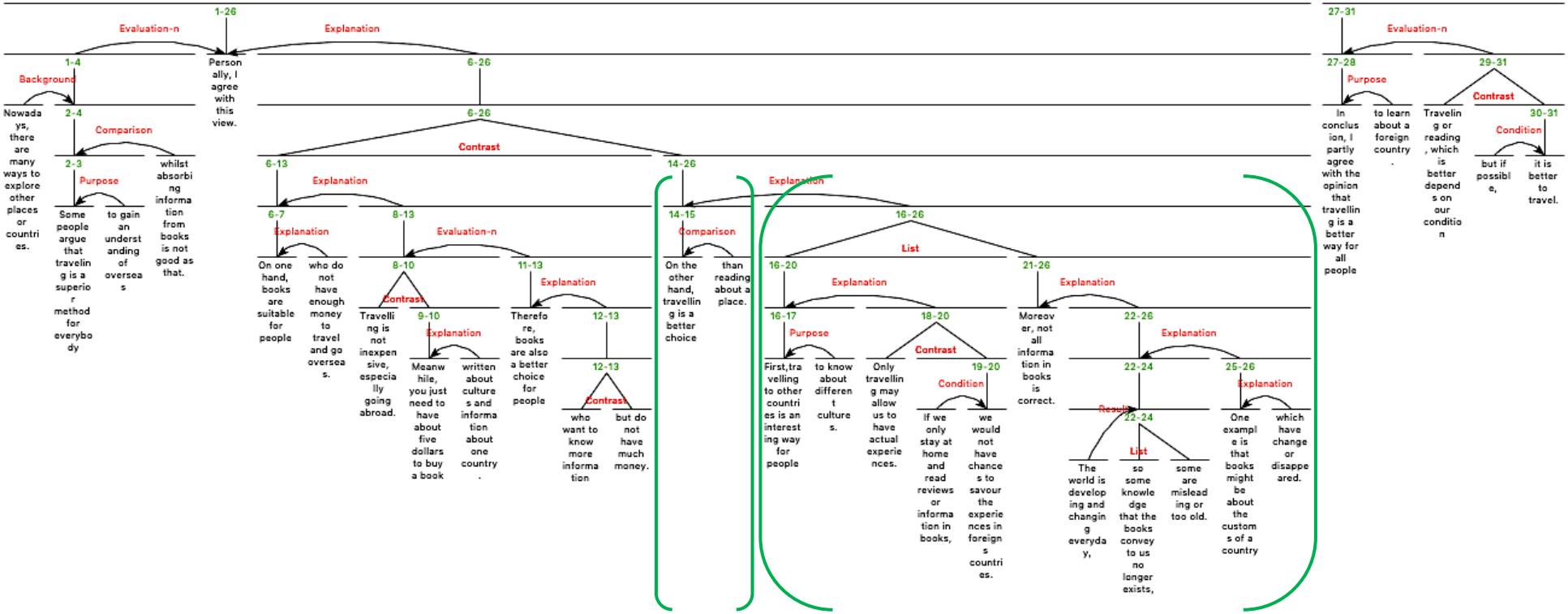

Figure 4.17: Coherence between topic sentence and supporting sentences in Post-1C

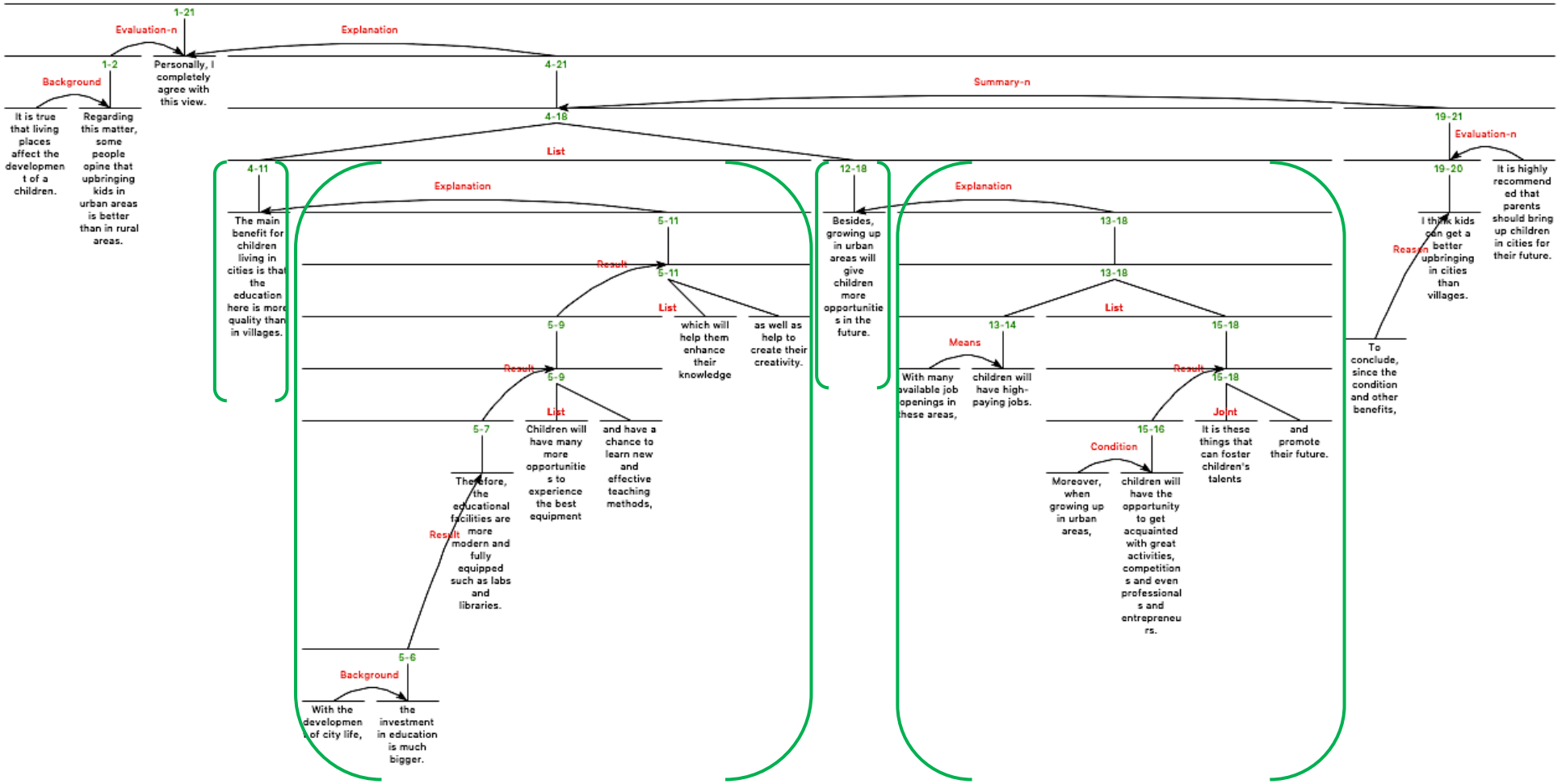

Figure 4.18: Coherence between topic sentence and supporting sentences in Post-2C

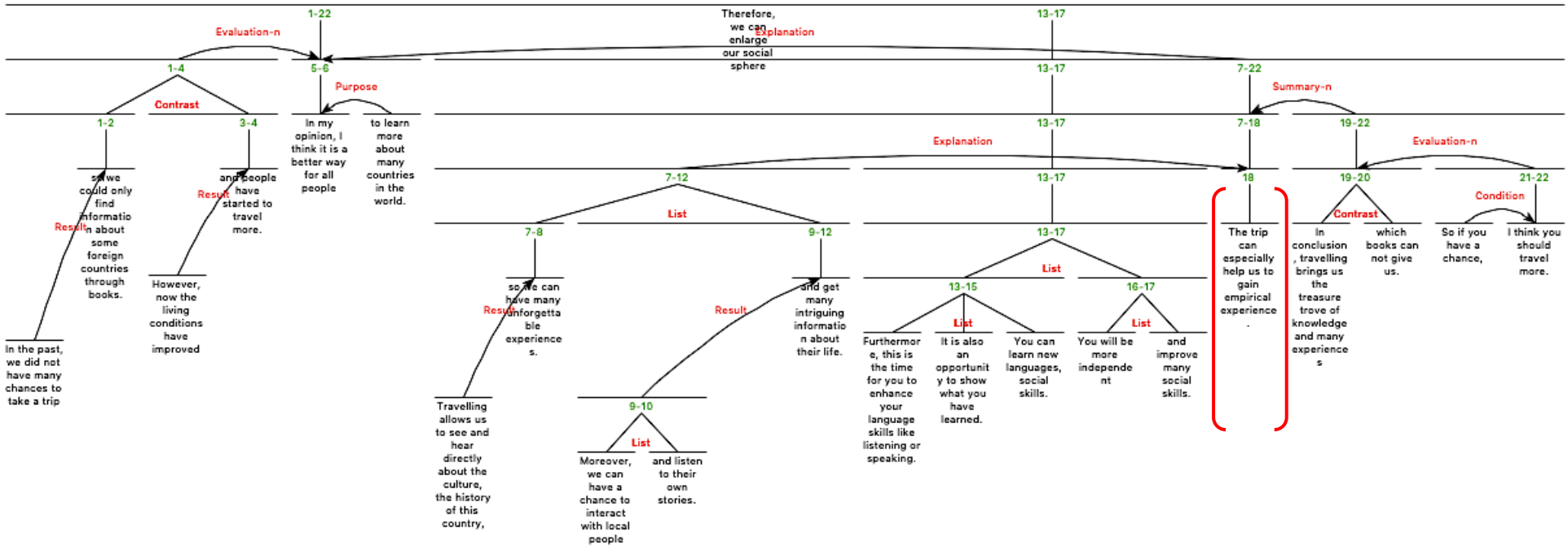

Figure 4.19: Incorrect place of topic sentence in Pre-D

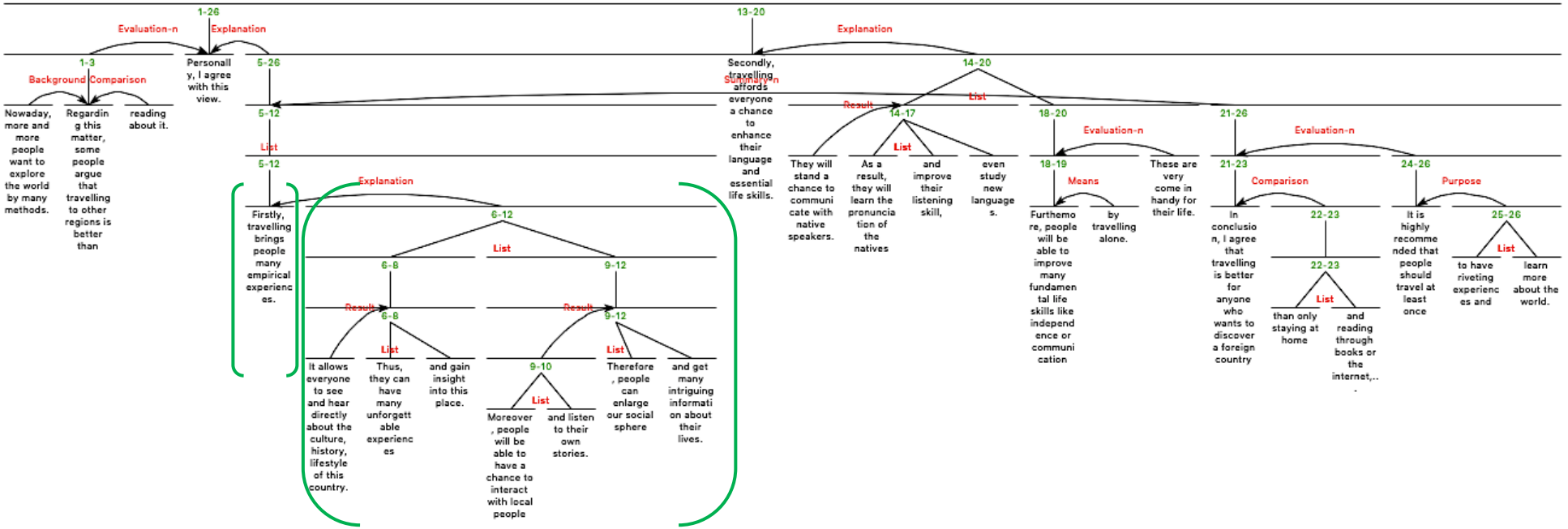

Figure 4.20: Correct place of topic sentence in Post-1D

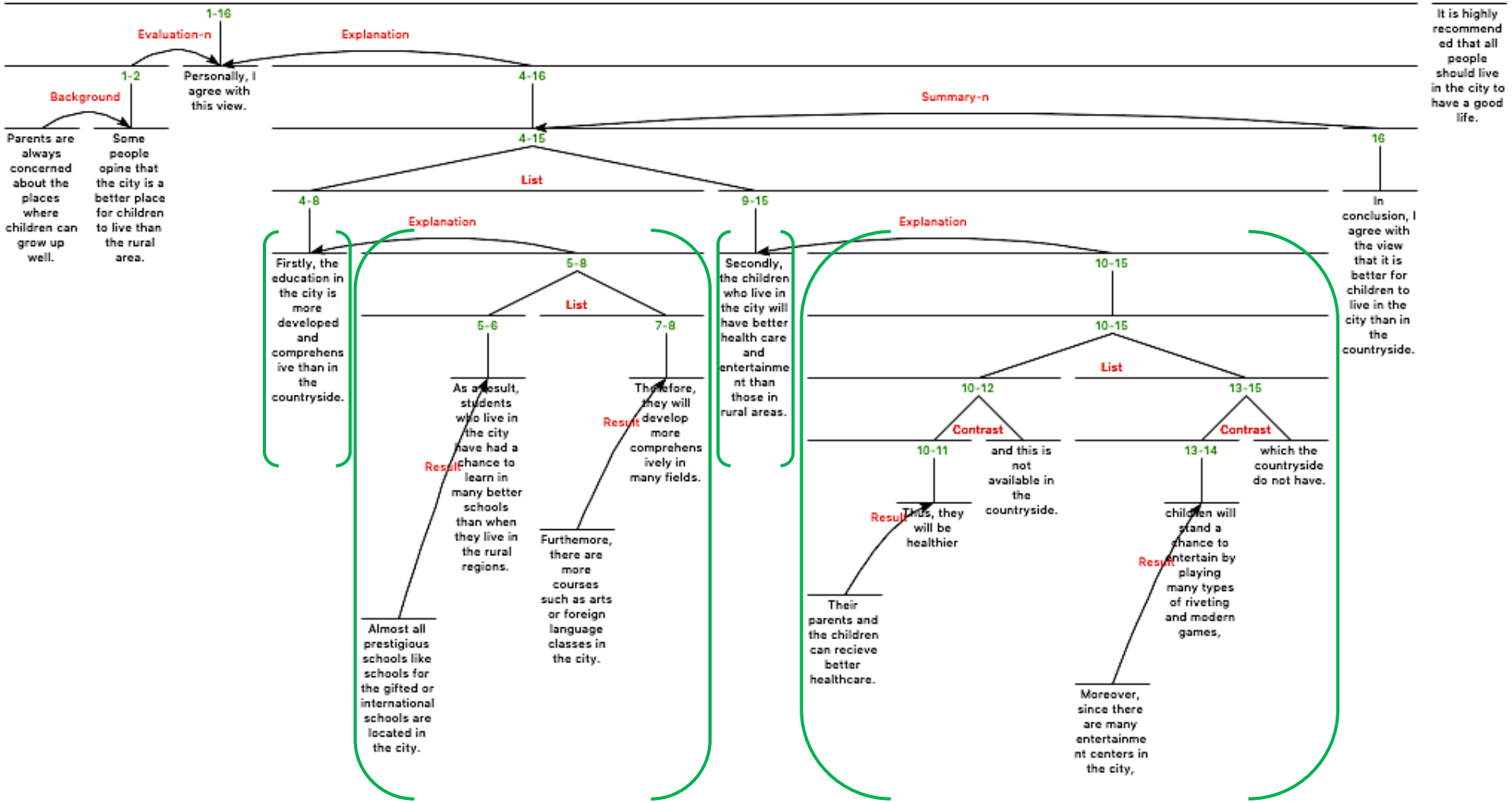

Figure 4.21: Correct place of topic sentence in Post-2D

Appendix 7: Examples of raters' scorings of Pre-A, Post-1A and Post-2A

Table 1: Scorings of Pre-A

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	Criterion 7	Criterion 8
Rater 1	5	5	5	5	4	2	3	4
Rater 2	1	5	5	5	3	3	3	3
Rater 3	3	5	5	4	2	5	4	3
Rater 4	1	5	5	2	2	3	1	2
Rater 5	1	3	2	1	2	5	2	3
Rater 6	1	3	4	1	3	3	3	3
Rater 7	1	5	5	1	3	2	2	3
Rater 8	5	5	4	2	2	3	2	5
Rater 9	3	4	5	4	4	2	5	3
Rater 10	1	5	5	3	5	4	4	5
Rater 11	1	5	1	2	5	3	3	5
Rater 12	1	5	5	4	3	3	4	5
Rater 13	1	5	5	3	2	3	4	5
Rater 14	1	5	3	2	3	2	2	2
Rater 15	2	5	5	4	3	3	4	5
Rater 16	1	5	5	3	3	2	2	4
Rater 17	1	5	2	2	2	2	3	4
Rater 18	1	5	5	4	3	2	3	5
Rater 19	1	4	3	2	2	3	1	1
Rater 20	1	5	4	3	3	3	3	3
Mean	1.65	4.70	4.15	2.85	2.95	2.90	2.90	3.65

Table 2: Scorings of Post-1A

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	Criterion 7	Criterion 8
Rater 1	5	5	5	5	3	3	5	4
Rater 2	3	5	5	5	2	3	5	3
Rater 3	5	5	5	5	3	1	4	3
Rater 4	5	5	5	5	2	2	4	3
Rater 5	4	5	4	5	3	1	5	3
Rater 6	2	4	5	5	2	3	4	3
Rater 7	5	5	5	5	1	3	5	3
Rater 8	5	5	5	5	3	3	5	5
Rater 9	5	4	5	4	2	3	5	3
Rater 10	1	5	5	5	3	2	4	5
Rater 11	4	5	5	5	2	3	5	5
Rater 12	1	5	4	5	1	2	5	5
Rater 13	4	5	5	5	3	3	5	5
Rater 14	4	4	3	4	3	2	3	2
Rater 15	4	5	4	5	3	2	5	5
Rater 16	5	5	5	5	3	2	5	4
Rater 17	4	3	5	5	3	3	1	4
Rater 18	5	5	3	5	3	3	5	5
Rater 19	4	4	5	5	3	2	4	3
Rater 20	5	4	4	4	4	3	4	3
Mean	4.00	4.65	4.60	4.85	2.60	2.45	4.40	3.80

Table 3: Scorings of Post-2A

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	Criterion 7	Criterion 8
Rater 1	5	5	5	5	5	5	5	5
Rater 2	3	5	3	5	4	5	5	2
Rater 3	5	5	4	5	5	4	3	5
Rater 4	5	5	5	5	5	3	5	5
Rater 5	4	5	4	4	4	4	4	3
Rater 6	3	4	5	5	4	5	5	4
Rater 7	4	5	5	5	4	5	4	5
Rater 8	5	5	5	3	5	4	5	5
Rater 9	3	5	5	5	5	5	4	3
Rater 10	4	5	5	4	5	5	5	5
Rater 11	2	5	5	5	2	5	4	5
Rater 12	4	5	4	5	5	4	5	4
Rater 13	4	5	2	4	3	4	4	2
Rater 14	5	5	5	5	5	4	5	5
Rater 15	5	5	3	5	4	4	4	4
Rater 16	4	5	5	5	4	5	4	4
Rater 17	5	3	5	5	4	4	5	3
Rater 18	5	5	3	4	5	5	4	3
Rater 19	5	5	5	5	5	5	5	5
Rater 20	5	5	4	5	4	4	5	5
Mean	4.25	4.85	4.35	4.70	4.35	4.45	4.50	4.10