# Vivid educational texts

Engaging students via
narrative and voice elements

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# Vivid educational texts

## Engaging students via narrative and voice elements

Levendige educatieve teksten

Verhalende en stem-elementen
als motiverende factoren

(met een samenvatting in het Nederlands)

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*Ik wist dat ik meer wist dan ik dacht dat ik wist*

*Enten går det bra, ellers går det over*
Andreas Haukeland

# Contents

# Chapter 1
## Introduction

Despite the increasing quantity of digital resources, educational textbooks are still the predominant instructional medium in present-day Dutch primary and secondary education classrooms (Woldhuis et al., 2018). As a result, students' educational success is highly dependent on the extent to which they understand the texts these books include. However, being capable of properly understanding educational texts is not self-evident: many Dutch students find their educational texts too difficult to understand and/or consider them boring (Dood et al., 2020; Gubbels et al., 2017, 2019; Inspectorate of Education, 2017, 2020, 2021). Text comprehension is especially challenging in content-area subjects, such as biology and geography, because educational texts for these school subjects tend to introduce unfamiliar and subject-specific terminology, make use of non-conversational, academic language, and/or discuss topics that are not directly related to students' daily lives or background knowledge (Allington, 2002; Best et al., 2005; Bogaert et al., 2008; Chambliss, 2002; Graesser et al., 2002; Lee & Spratley, 2010; Schleppegrell, 2004).

As text comprehension is the result of complex interactions between reader, task, and text characteristics, its optimization can be approached in more than one way (Snow, 2002; White, 2010). Some research has, for instance, focused on the characteristics of the reader, such as the relation between text comprehension and students' reading fluency (e.g., Álvarez-Cañizo et al., 2015; Fuchs et al., 2001; Kim & Wagner, 2015), while other research has focused on the characteristics of the task, such as the influence of the reading purpose on text comprehension (e.g., Linderholm & van den Broek, 2002; Narvaez et al., 1999; Zwaan, 1994). The current dissertation takes a different approach, by focusing on the characteristics of educational texts. In particular, this dissertation explores two types of elements that have been argued to make educational texts more vivid, thereby enhancing students' text comprehension via increased reading engagement: narrative and voice elements.

The next section introduces narrative and voice elements as vividness-increasing strategies within the context of educational texts (Section 1). Subsequently, the focus shifts from the educational domain to additional functional domains, within which narrative and voice elements have been argued to be of added value (Section 2). Finally, this introduction presents the research questions that guided the research in this dissertation (Section 3) and gives an overview of its remaining chapters (Section 4).

## 1. Enhancing text comprehension via engagement: vividness-increasing strategies

Well-designed educational texts support students to construct a coherent mental representation that connects the content of the text to their background knowledge (cf. Kintsch, 1998). Learning is stimulated if the representation expands this background knowledge or if it corrects previous misunderstandings (van den Broek, 2010). Thus, to ensure optimal learning, it is important that educational texts are designed in such a way that they provide enough cues for students to establish a solid connection between the educational content and their background knowledge. In this respect, it is essential that educational texts are engaging. That is, students who find their educational texts boring to read are likely to be easily distracted from reading, paying only shallow attention to the texts' content. By contrast, students who consider their educational texts interesting to read are likely to be better motivated to actively process the educational content. Active processing has been argued to lead to higher attention to the to-be-learned information presented in an educational text, which results in deeper understanding and better learning of this information (Beck et al., 1995; Brozo et al., 2007; Guthrie & Wigfield, 2000; Hidi, 2001; Sadoski, 2001; Schraw & Lehman, 2001).

The extent to which students are actively engaged in reading their educational texts is affected by the characteristics of these texts, including their content, form, and style (Beck et al., 1995). In the Netherlands, educational textbooks are developed by independent publishing companies that have considerable liberties to translate government-set curricular objectives into educational materials (Bisschop et al., 2016). Consequently, educational publishers play a critical role in the design of Dutch educational texts. To provide students with adequate cues for the understanding of these texts, Dutch educational publishers seem to adopt a variety of textual strategies intended to enhance students' level of engagement for these texts.

Besides fully expository texts like (1), which discusses purely factual information about the skins of animals, and introduces new terminology like "fur" and "plumage", Dutch educational textbooks include texts with all kinds of non-expository features.[1] For instance, the educational content in (2), which is about herd animals' way of living, is placed in a narrative context by its introduction through the eyes of forester Jan.

[1] Throughout this dissertation, excerpts from Dutch educational textbooks are represented by their English translations. For the textbook sources, see Appendix A.

(1) The skin of mammals and birds grows with the rest of the body. The skin is soft and stretchy. The skin of most mammals is covered with hair (the fur). The skin of birds is covered with feathers (the plumage). Fur and plumage adjust to the seasons. In fall, they become thicker. In spring, they become thinner. Then the animals are molting.

(*Natuurzaken*, biology grade 5, p. 78)

(2) Forester Jan is a real animal lover. He is astonished by what he sees in the Lauwersmeer area. He especially likes the groups of Scottish Highlanders and Konik horses. They have been allowed to graze in the area. They prefer to stay together, in their own group. As a herd animal it is easier to look for food. Sometimes it can also be safer to move around together. And raising young is also easier together. A group often has a leader. He determines what happens.

(*Argus Clou Natuur en Techniek*, biology grade 5, p. 56)

In addition, in (3), the author of the text interactively conveys educational content about electricity by relating its use to students' own lives, by directly addressing them as individuals ("you"), and by asking them a question that is aimed to arouse their interest for the topic. Such author-initiated features, which make an educational text "speak" to students and facilitate an interaction between the text's author and students, are called voice elements (cf. Beck et al., 1995).

(3) Electricity is something you use every day. You press a button and the light flashes on. But how does that actually work? Electricity is the movement of tiny charged particles: electrons. These particles flow around in a circle: the circuit. If the circuit is interrupted, no electricity can move through it. Electricity can only flow when the circuit is closed. With a switch, you can close and break the circuit: on, off, on, off!

(*Binnenstebuiten*, biology grade 5, p. 27)

Both non-expository strategies seem to be well characterized by the notion of vividness. Vivid texts aim to attract and hold readers' attention and excite their imagination to the extent that the content is "1) emotionally interesting, 2) concrete and imagery-provoking, and 3) proximate in a sensory, temporal, or spatial way" (Nisbett & Ross, 1980, p. 45). The first two dimensions of vividness have regularly been associated with narrativity: narrative texts have been identified as vivid texts, because they are often emotionally interesting, use concrete language, and excite readers' imagination, and have therefore been posited to have more impact on readers than texts that merely convey abstract information, such as facts or statistical analyses (Nisbett & Ross, 1980). The third dimension of vividness can be linked to voice

elements, as they bring the educational content in closer proximity to students via the imitation of a direct, "here and now" interaction between them and the educational text's author. It has been argued that the more vivid a text is – that is, the more of these dimensions are present in the text –, the more likely its content is to be stored and remembered (Nisbett & Ross, 1980). Accordingly, making educational texts more vivid by the application of strategies of narrativity and/or voice may be an adequate means to strengthen students' level of engagement, and thereby enhance their text comprehension.

However, it has yet to be determined how and when narrative and voice strategies are used in current Dutch educational texts, and what Dutch educational publishers' specific rationales are behind the application of these strategies. In addition, it remains unclear how effective these strategies are in enhancing students' engagement and text comprehension. Yet, considering the added value of narrative and voice strategies in other functional domains, their effectiveness in the educational domain seems promising.

## 2. Vividness-increasing strategies in other functional domains

Vividness-increasing strategies are used in many different functional domains, some of which will be highlighted in this section. The consideration of additional domains is not meant to be all-embracing, but rather serves to contextualize the focus of this dissertation on narrative and voice elements as strategies to enhance students' engagement and text comprehension.

### *2.1 Narrativity: journalism and health communication*

Because of the assumed power of narratives over time, the impact of narrative communication has been well-studied in all kinds of functional domains. In these domains, narrative elements serve different purposes. In journalism, for instance, narrative elements are used to inform people in a vivid manner about what is going on in the world. News narratives have been argued to attract and maintain readers' attention better than traditional news reports, because narratives are our basic mode of interaction: we can easily relate to news narratives, because they resemble the stories we come across in our daily lives all the time (van Krieken & Sanders, 2017). In addition, news narratives have been claimed to provide readers with the opportunity of experiencing otherwise distant events from a closer viewpoint, by inviting them to become "mediated witnesses" (Peelo, 2006). This way, readers can empathize with eyewitnesses and/or victims of news events, and have the feeling that they were present at the events themselves. This latter function explains news narratives' capacity to provide a meaningful context to news events (van Krieken & Sanders, 2017). Indeed, empirical research indicates that the use of narrative elements in news reports positively affects empathy as well as the feeling of having been present at the

events in comparison to traditional journalism (e.g., Oliver et al., 2012; Shen et al., 2014; van Krieken et al., 2015a).

In health communication, narrative elements are used for their persuasive effects on people's attitudes, intentions, and behaviors. Narrative health interventions have been claimed to facilitate attention, comprehension, and recall of health information, because they reduce counter-arguing, facilitate vivid representations, engage the emotions, and provide role models to whom readers can relate (Green, 2006; Hinyard & Kreuter, 2007; Kreuter et al., 2007). These positive effects of narrative health interventions on people's attitudes, intentions, and behaviors have been confirmed by empirical research (cf. Dillard et al., 2010; Falzon et al., 2015; Lemal & Van den Bulck, 2010; Shen et al., 2015). However, it has also been argued that in previous health communication research narrativity has been operationalized in so many different ways that continued empirical research is needed to find out which narrative elements precisely lead to optimal effects within this domain (Dahlstrom et al., 2017; de Graaf et al., 2016; Hinyard & Kreuter, 2007).

Even though the beneficial effects of narrative elements found in functional domains such as journalism and health communication are promising, they do not necessarily translate one-on-one to the educational domain. In both journalism and health communication, narrative elements are hypothesized to facilitate "transportation" (cf. Green & Brock, 2000, 2002), or "absorption" (cf. Slater & Rouner, 2002). That is, in both domains, readers are "immersed" into a story, and get closely involved with the story's events and its characters. This influences their perceptions of the world.

With respect to the educational domain, such narrative transportation can lead to both positive and negative effects. On the one hand, narrative transportation might affect students' text comprehension due to increased attention to and emotional engagement with the educational text, which could make it easier for students to relate to its content. In addition, the concrete information provided by narrative elements could serve as a mental "hat rack" to which more abstract educational content can be linked, making it easier for students to make relevant connections (for the effects of "concreteness", see also Sadoksi, 2001).

On the other hand, narrative transportation could lead to negative effects because students pay too much attention to narrative details, such as character names and appearances, which could shift their attention away from the actual information they need to comprehend and learn (cf. "seductive details", Garner et al., 1989; Harp & Mayer, 1998). In addition, narrative elements could cause confusion about the text's learning aims. That is, a narrative educational text could lead students to think that they are reading the text for entertainment rather than for learning. In this case, students might not even consider reading its content for learning.

It is yet unclear whether narrative elements in educational texts lead to positive or negative effects on students' engagement and text comprehension, as previous

empirical studies found evidence for both outcomes (cf. Best et al., 2008; Cervetti et al., 2009; Romero et al., 2005; van Silfhout, 2014). Therefore, in defining narrativity within the educational domain, this dissertation also considers the ways in which the narrative genre has been operationalized in the experimental texts of previous empirical studies, and explores what these operationalizations already disclose about the effectiveness of narrative elements in educational texts, and what remains to be uncovered in the future.

*2.2 Voice: online brand communication*

Voice elements are another means to make communication more vivid. While voice elements are less extensively studied than narrative elements, they turn out to be quite useful in online brand communication. Brands use voice elements in their online communication as a means to more closely connect with their consumers, positively influence their opinions about products or the reputation of the company as a whole, and avert crises such as online complaints from dissatisfied consumers. Within online brand communication or "webcare", voice elements are defined within the boundaries of "conversational human voice" (CHV), which is described as "an engaging and natural style of organizational communication perceived by an organization's publics based on interactions between individuals in the organization and individuals in publics" (Kelleher, 2009, p. 177).

Brands can, for instance, employ CHV by personally addressing their consumers as individuals with the second-person pronoun "you", or by asking them questions and invite them to further conversation (e.g., "Do you have any further questions?", for an overview of CHV strategies, see Brouwer & den Ouden, 2018; van Noort et al., 2014). Research has shown that these and other CHV strategies indeed have a positive effect on consumers' brand evaluations, such as reputation and trust (Beldad et al., 2010; Crijns et al., 2017; Javornik et al., 2020; Kelleher, 2009; Kelleher & Miller, 2006; Sweetser & Metzgar, 2007; van Noort & Willemsen, 2011; Yang et al., 2010). However, as research indicates that CHV is not always clearly defined in empirical studies, and different types and numbers of operationalizations of CHV are used, it seems likely that not all CHV strategies, or combinations thereof, are as powerful (cf. Brouwer & den Ouden, 2018; Liebrecht et al., 2021).

Nevertheless, the beneficial effects of CHV in the domain of online brand communication suggest that voice elements could also be of added value in the educational domain: using voice elements in educational texts could increase students' personal involvement with the text, inviting them to react to the text's content, stimulating positive attitudes towards the to-be-learned information, and making it easier for students to relate to it. This could then lead to better text comprehension. However, as for narrative elements in journalism and health communication, the impact of voice elements in online brand communication does not necessarily map one-on-one to their effectiveness in the educational domain.

Additionally, CHV seems to be a broader concept in online brand communication than the interpretation of voice elements in the educational domain, as it also includes brand strategies such as personal signatures at the end of messages ("Anna from costumer services") and well-wishing ("We look forward to welcoming you back in the future").

## 3. Research questions

As previous research in health communication and online brand communication presents a diversity in the kinds of narrative and voice elements and combinations thereof that are effective in these domains, it seems that several crucial steps need to be taken before the effectiveness of narrative and voice elements in the educational domain can be properly researched. This dissertation tackles these crucial steps by carefully 1) defining narrativity and voice within the boundaries of the educational domain (WHAT), 2) investigating the application of narrative and voice elements in current Dutch educational texts (HOW), and 3) finding out publishers' rationales behind the use of these elements (WHY). The research in this dissertation is guided by the following general research question:

> What is vividness in educational texts, and how and why is it applied in the Dutch educational domain?

In this dissertation, vividness in educational texts is characterized by referring to the notions of narrativity and voice. In order to answer the general question, the following research questions guide the subprojects of this dissertation:

RQ1. What characterizes narrativity and voice in Dutch educational texts?
RQ2. How is narrativity operationalized in previous research into educational texts, and to what extent are conflicting genre effects on text comprehension and/or recall caused by differences in these operationalizations?
RQ3. How and when are narrative and voice elements currently being used in Dutch educational texts?
RQ4. What are the opinions and policies of Dutch educational publishers regarding the use of narrative and voice elements in educational texts?
RQ5. To what extent do Dutch students appreciate texts with and without voice elements differently?

## 4. Chapter overview

This dissertation reports on the what, how, and why of applying narrative and voice elements in Dutch educational texts, and contains eight chapters, starting with the current introduction (**Chapter 1**) and ending with a general discussion and conclusion

(**Chapter 8**). Since the six core chapters were written as individual papers, readers will find some overlap in the theoretical background sections of these chapters. The advantage this offers is that each chapter can be read on its own. Publishing information is provided at the beginning of the chapters. While all core chapters are co-authored, the writing of the chapters, as well as the study's design, execution, analysis, and interpretation of results have been predominantly mine.

**Chapter 2** charts the various ways in which educational texts can be made more vivid, focusing on textual realizations of narrativity and voice (cf. RQ1). Three narrative elements that can be considered prototypical in the educational domain are defined, namely 1) a sequence of particularized events, 2) an experiencing character, and 3) a representation of a landscape of consciousness. It is shown how these elements are applied in varying combinations in Dutch educational texts. In addition, it is illustrated how educational texts can be given a voice via author-initiated textual elements, such as questions, evaluations, and exclamations.

**Chapter 3** examines how the three prototypical narrative elements defined in Chapter 2 have been operationalized in previous empirical research into narrativity in educational texts. This chapter also explores what the effects reported in these studies tell about the effectiveness of narrative elements in educational texts (cf. RQ2).

**Chapter 4** and **Chapter 5** present two quantitative corpus-based analyses that investigate how and when narrative and voice elements are being used in present-day Dutch educational texts (cf. RQ3). Both chapters focus on educational texts for the content-area subjects biology, geography, and history, and concentrate on texts for grade 5 (Dutch *groep 7*) and for grade 8 (pre-university track, Dutch *vwo 2*).[2] While grade 5 students have acquired the basic reading skills required for a deep understanding of texts, grade 8 students need to be able to read and understand more challenging texts, particularly in pre-university education.

**Chapter 6** discusses the results of two focus group sessions and a group interview on the opinions and policies of Dutch educational publishers regarding the use of narrative and voice elements in educational texts (cf. RQ4). This chapter describes which perceived advantages, perceived disadvantages, and additional considerations Dutch educational publishers take into account throughout decision making with respect to these elements. Additionally, this chapter links educational publishers' opinions and policies to their actual practices, as established in the corpus-based analyses of Chapter 4 and Chapter 5.

**Chapter 7** presents the results of an off-line reading experiment, investigating the extent to which Dutch fifth graders appreciate texts with and without voice elements differently (cf. RQ5). In addition, this chapter examines whether students' appreciation of voice and non-voice texts is affected by the nature of the educational

[2] Pre-university education is the highest secondary education level in the Netherlands.

content and to what extent students are actually able to distinguish between these two kinds of texts.

Finally, **Chapter 8** summarizes the findings of its preceding chapters. In addition, this chapter reflects on remaining issues as well as suggests directions for future research, sketching a perspective of the what, how, and why of using narrative and voice elements in educational texts that transcends that of individual chapters. Furthermore, this chapter formulates issues that future empirical research should take into consideration and outlines some practical implications for educational publishers.

# Chapter 2
## Vivid elements in Dutch educational texts

Educational publishers often make their expository texts more vivid, by making them emotionally interesting, concrete and imagery-provoking, and proximate in a sensory, temporal, or spatial way. Previous studies have found mixed results regarding the effects of vividness on the attractiveness, comprehensibility, and memorability of educational texts. In order to be able to account for these mixed results, we chart and describe the various ways in which educational texts can be made more vivid. Drawing from the literature on narrativity, we define prototypical narrative elements in the educational domain (i.e., particularized events, experiencing character, landscape of consciousness), and demonstrate that Dutch social studies and science texts apply these elements in varying combinations. Subsequently, we illustrate how texts can be given a voice by imitating a direct, "here and now" author-student interaction.

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## 1. Introduction

Many Dutch students consider their educational texts boring and find them difficult to understand (Inspectorate of Education, 2006, 2017; Land, 2009). Especially in non-language subjects, such as social studies and science, there are strong indications that many Dutch educational texts are too difficult to be read by students independently (Bogaert et al., 2008). This raises the question as to what current Dutch educational texts look like and how they can be made more attractive, comprehensible, and memorable. The answer to this question is important, because a proper understanding of such texts is crucial to successfully complete an educational career (Bogaert et al., 2008; Jansma et al., 2011).

A first look at Dutch educational texts, which we exemplify by their English translations, shows that these texts are very diverse in their characteristics. We encounter educational texts that are completely expository, providing only factual, to-be-learned information. This information is often conveyed in an abstract style of writing, using a clear, non-narrative structure, and terminology that is specific to the subject. The expository text in (1), for instance, discusses the term "biodiversity".

(1) There are millions of different kinds of beings. This broad variation is called biodiversity. Bio is life and diverse means different. Something lives if it has all or most of these characteristics: reproduce, grow, move, react, breathe, eat, and excrete.

(*Binnenstebuiten*, biology grade 5, p. 9)

In addition, we find texts that combine expository features with all kinds of non-expository elements. For instance, in (2), experiencing characters are added to the to-be-learned information about in vitro fertilization treatment (IVF treatment).

(2) The Indian Rajo Devi Lohan gave birth to a healthy daughter. Rajo and her husband had wished for a child for years, but it did not happen. That is why they decided to take an IVF treatment. With this treatment an egg cell and a sperm cell are brought together in a test tube. When they fuse, the fertilized egg is placed in the womb of the woman.

(*Binnenstebuiten*, biology grade 5, p. 44)

Furthermore, in (3), the educational content about traditional clothing is introduced by posing a personal question.

(3) Do you prefer your clothes to look nice over them being comfortable? People used to consider their clothes mainly important for protecting their bodies against the weather or against scratches of branches. This means that clothes had to be robust and warm.

(*Wijzer! Geschiedenis*, history grade 5, p. 16)

It is unclear what the consequences of the inclusion of such non-expository elements are for the attractiveness, comprehensibility, and memorability of the educational content. Some studies have, for instance, shown that narrative elements lead to increased comprehension and recall (e.g., Best et al., 2008; Romero et al., 2005), whereas other studies have revealed negative outcomes (e.g., Cervetti et al., 2009; van Silfhout, 2014). An explanation for this discrepancy may be found in differences in the operationalization of "narrativity". For instance, Romero et al. (2005) report better recall for narrative texts that take place in a specific setting and describe the actions and feelings of human characters. One of their narratives is about the rescuing of oiled seabirds after an oil spill, which is told from the perspective of volunteer Sharon, who lives in the Humboldt Bay area in the north of California. By contrast, Cervetti et al. (2009) find worse comprehension and recall for a narrative that reports on events concerning a non-human character without having a specified setting. For example, in one of their experimental texts, the process of erosion is explained by means of a story about a small rock named Sandy who travels through the sea and ends as a tiny grain of sand. A systematic characterization of the kinds of non-expository textual elements used in educational materials is important for the interpretation of these and other mixed results on the attractiveness, comprehensibility, and memorability of educational texts.

At a conceptual level, vividness seems to be a promising notion for the characterization of non-expository elements in educational texts. Vivid texts aim to attract and hold readers' attention and excite their imagination to the extent that the content is "1) emotionally interesting, 2) concrete and imagery-provoking, and 3) proximate in a sensory, temporal, or spatial way" (Nisbett & Ross, 1980, p. 45). The degree to which a text is emotionally interesting concerns the readers' involvement with the participants of the described events. That is, we consider events that happen to us personally or to the people we care about to be more interesting than events that involve strangers. Concreteness refers to the degree of detail given in the text; more details make it easier to visualize the text's content. Proximity deals with the readers' relative sensory, temporal, and spatial distance to the content of the text. Nisbett and Ross (1980) have argued that the more vivid a text is (i.e., the more of these three dimensions present in the text), the more likely its content is to be stored and remembered. Therefore, making educational texts more vivid seems an adequate strategy to enhance their attractiveness, comprehensibility, and memorability.

For our purposes, we need to link the conceptual notion of vividness to the textual characteristics of educational texts. Therefore, we will relate the three dimensions of vividness to notions from the field of literature, particularly narrativity, and the study of educational texts, namely the voice of a text (Beck et al., 1995). The first two dimensions of vividness have regularly been associated with narrativity; since narratives are often emotionally interesting, use concrete language and excite the readers' imagination, they have been identified as vivid texts and are posited to have more impact than texts that merely convey abstract information, such as facts or statistical analyses (Nisbett & Ross, 1980). The proximity dimension of vividness can be linked to textual elements that decrease the distance between the reader and the educational content. The interaction between the reader and the author of the text, also known as the text's "voice", plays an essential role in doing so (see Beck et al., 1995). This voice represents the aspects of the text that make it "speak" to the reader, such as the use of second-person pronouns addressing the reader ("Perhaps *you* thought that only humans and animals reproduce. However, plants do too") instead of impersonal ways of writing ("Just like humans and animals, plants can reproduce").

In Sections 2 and 3, we will discuss how these notions can be related to specific textual features of a text. We will illustrate this with translated examples from Dutch primary school materials designed for the subjects history (social studies), biology, and geography (science) in grade 5, the grade in which students need to learn how to read more and more abstract texts, about topics that are increasingly less related to their daily lives (Evers-Vermeul & Holtermann, 2013). The materials under investigation comprise seventeen educational textbooks from five well-known educational publishers in the Netherlands (see Appendix A). In the final section of this chapter, Section 4, we will discuss the implications of our analyses and suggest directions for future research.

## 2. Strategies of vividness: narratives

To gain insight into the textual realizations of vividness in Dutch educational texts, we make use of textual elements that are discussed in literature on narrativity. To this end, we will first establish what "narrativity" is, and determine the textual elements that contribute to our interpretation of narrative in the educational domain (Section 2.1). Based on these elements, we will then give a characterization of Dutch educational texts, focusing on fully narrative texts (Section 2.2) and narrative-like texts (Section 2.3).

### *2.1 What is a narrative?*

Over time, many definitions of the concept narrative have been formulated in the narratological literature. A recurring element in these definitions is the representation of events, although scholars have disagreed about whether a single event suffices for a narrative (Abbott, 2008; Genette, 1982), or whether at least two events, ordered in

time, are needed (Labov, 1972; Prince, 2003; Rimmon-Kenan, 2002). Other scholars have gone one step further by arguing that the events of a narrative should be connected in a non-random way, including relations of causality (Bal, 1997; Onega & Landa, 1996; Richardson, 1997; Sanford & Emmott, 2012), and that they require involvement of human or quasi-human entities (Fludernik, 2009; Herman, 2009; Norris et al., 2005; Ryan, 2007; Toolan, 2001). Toolan (2001) has combined these narrative aspects in what he calls a slightly less minimal definition of a narrative, which describes that "a narrative is a perceived sequence of non-randomly connected events, typically involving, as the experiencing agonist, humans or quasi-humans, or other sentient beings, from whose experience we humans can 'learn'" (Toolan, 2001, p. 8).

Supplementary to this definition, it has been argued that the non-randomly connected events of a narrative are particularized (e.g., "Last Tuesday, Lisa received her Master's degree in the great hall of her university") rather than generic (e.g., "Many students graduate from university every year"), referring to specific events, involving specific characters, and/or introducing specific settings (i.e., space and time) (Herman, 2009; Norris et al., 2005; Ryan, 2007; Sanford & Emmott, 2012). Increasing the degree of detail for these aspects makes a text more concrete and prompts sensory imagery of the text's content.

Additional views on narrativity can be found in psychological literature on narrative processing. During text processing, readers aim to construct a mental representation of the situations described. This mental representation, the situation model, has to be updated when newly read information is being processed (Kintsch, 1998, 2013). According to the event-indexing model (Zwaan et al., 1995a, 1995b), readers keep track of five aspects during the processing of narratives: space, time, protagonist, causality, and intentionality. After a first indexation of these aspects, readers monitor whether the incoming information requires updating one or more of them. If it does, the situation model is adapted. Experimental research has shown that changes in the situation model lead to comprehension difficulties, such as increased reading times (Zwaan et al., 1995b).

While the first four aspects of the event-indexing model largely correspond to the narrative elements present in minimalist definitions from the narratological literature, intentionality can be related to the concept of conflict-resolution represented in more elaborate definitions. In these definitions, it is claimed that narratives tend to shape around some conflict, that needs to be resolved (Labov, 1972; Ryan, 2007, Sanford & Emmott, 2012). It is the character's intentions, goals, and/or motives that initiate a story's conflict and resolution. That is, friction between characters' goals and their environment, or friction between characters' diverging desires, lead to a conflict, which subsequently initiates a new goal: solving the conflict.

The intentions, goals, and/or motives of a character can be conveyed to readers by giving them insight into this character's inner world. In a narrative, readers gain insight into this inner world through the expression of thoughts, beliefs, feelings, and sensory perceptions (Bruner, 1986; Herman, 2009; Sanford & Emmott, 2012). While the relations between a character's actions and their consequences are often identified as the "landscape of action", this insight into a character's inner world is also referred to as the "landscape of consciousness" (Bruner, 1986). Although both landscapes are constructed in narratives, some narratives aim more attention at the description of the actions, while others focus more on the mental perceptions guiding these actions (Cupchik & Laszlo, 1994). When a landscape of consciousness is not explicitly elaborated upon in the narrative, readers have to make inferences about the character's intentions themselves. This demands more processing efforts on the readers' behalf than when the character's inner world is reflected upon in the narrative.

Instead of following a strict binary focus that is often pursued in the literature, Ryan (2007) has proposed a scalar conception of narrative, focusing on the question "is text 1 more narrative than text 2?" rather than "is text 1 a narrative?" According to Ryan (2007, p. 28), narratives should be viewed as "a fuzzy set allowing variable degrees of membership, but centered on prototypical cases that everybody recognizes as stories", an idea that leads back to research in cognitive science on prototype theory (Rosch, 1973). In prototype theory, categories are not defined by a fixed set of features but rather evolve around central exemplars. Each categorical exemplar can be related to this prototype to a greater or lesser extent, without losing its membership of the category (Jannidis, 2003). That is, a blackbird is seen as a prototypical bird, whereas a penguin is not, because it cannot fly. Nonetheless, penguins belong to the category "birds". Within the category "narratives", we can also distinguish prototypical exemplars, as well as exemplars that are more or less distant from this prototype.

For narratives, however, the context of interpretation affects which exemplars count as the central ones (Herman, 2009). For instance, while news narratives serve as prototypical narrative exemplars in journalistic contexts (cf. van Krieken & Sanders, 2016), novels are often considered as prototypes in more literary contexts. In this chapter, we aim to chart the exemplars that can be considered prototypically narrative in the context of education (Section 2.2), and those that are to a greater or lesser extent similar to this narrative prototype (Section 2.3). In our analyses, we will use the "prototypical" narrative elements defined above to describe narrative(-like) texts in Dutch educational materials. We should, however, keep in mind that, given their often restricted length, educational texts are less likely to incorporate all of these narrative elements compared to longer narratives.

### *2.2 Fully narrative texts*

In Dutch educational materials, prototypical narrative exemplars appear to be most commonly found in history textbooks, but can at times also be detected in textbooks

for biology and geography. A history text that can be considered a prototypical narrative is given in (4).

(4) Army commander Mauritius has trouble falling asleep. Tomorrow he and his troops will be travelling to Gaul to quell a rebellion. Mauritius approves of this plan. After all, the empire needs order and peace! However, the emperor has given an additional order: Mauritius has to kill all the Christians in the area. Mauritius is terribly shocked: he is a Christian himself, just like his soldiers. What should he do? The following days he cannot think of anything else. When they arrive in Gaul, he has made up his mind: Mauritius and his men refuse to kill the Christians. The emperor is furious about his disobedience and, as a punishment, gives the order to assassinate Mauritius and his soldiers. Many years later, the church decided to canonize Mauritius as a **saint**. People started to worship and depict him.
(*Wijzer! Geschiedenis*, history grade 5, p. 43)

In (4), a series of logically related events is represented, focusing on a main character named Mauritius. Even though the text deals with real historical events and describes the actions of a man who lived many years ago, these events and actions are particularized and (partially) fictionalized. Readers gain insight into Mauritius' landscape of consciousness through the expression of his opinions ("Mauritius approves of this plan"), feelings ("Mauritius is terribly shocked"), and thoughts ("After all, the empire needs order and peace!", "What should he do?"). In addition, Mauritius has a conflict to which a resolution is given: he decides to disregard the enforced command. Although this resolution leads to an unsatisfactory ending at first (i.e., Mauritius and his soldiers die), a more gratifying outcome is given at the end of the narrative through Mauritius' canonization. At this point, the narrative also provides a meaningful message to its readers: the content is linked to the readers' present by indicating that Mauritius is nowadays considered "a saint". In the textbook, this word is made bold to highlight its importance as to-be-learned terminology.

While (4) is rather short, educational publishers also include more elaborate narratives in their textbooks, varying from several paragraphs to a couple of pages. An example of (part of) such a narrative is given in (5), taken from the beginning of a geography textbook.

(5) It happened on a warm summer's evening. Meerkat Jules was watching the boats in the canal from the windowsill. I was sitting in my Globetub and, unexpectedly, zoomed in on the courtyard of an old Italian monastery with my magic satellite. Men were walking around in black clothes. I saw an open window and zoomed in a bit further. A book was lying on the table. I could read the title *Unique Inventions* by Simon Stevens. "It's a pity that my Argus scope cannot turn a page over there," I murmured. "We might find the book in a nearby library," said my assistant Mista. She typed the title of the book in her pocket computer, but could not find it. "It might be a very old book, Professor." "Or there might only be one copy." It made me curious.

(*Argus Clou Aardrijkskunde*, geography grade 5, p. 2)

The narrative in (5) shows a sequence of non-randomly connected and particularized events. However, as opposed to (4), these events are completely fictitious, as is the main character of the narrative, a professor named Argus Clou. Argus is looking through his "magic satellite" when he discovers the cover of an old manuscript in a monastery. Because he wishes to unravel the contents of the book but is unable to do so (conflict), he decides to pay the monastery a visit (seek for a resolution). The events that happen during this visit are recounted in the remainder of the text. The narrative balances Argus' landscape of action and his reflection on these actions. Readers gain extensive insight into Argus' inner world through the narrative's "I" perspective and the dialogues represented.

Narratives that take up several paragraphs or pages, like (5), can – in various ways – be more elaborate than shorter narratives, such as (4). First of all, longer narratives generally introduce more events, representing longer sequences of time and/or more causal relations. Longer narratives are also expanded by using more elaborate thought representations and dialogues, such as the conversations between Argus and his assistant Mista in (5). Finally, longer narratives tend to provide more detailed information on characters and/or settings. For example, while readers are only vaguely informed about the narrative's setting in (4), the opposite happens in (5). In (4), Mauritius and his soldiers will displace, presumably from *someplace* in the Roman Empire, to *somewhere* in Gaul, which will happen "tomorrow". By contrast, in (5), we find more specific information about the narrative's starting point: it all begins on a "warm summer's evening", with meerkat Jules watching the boats on the canal "from the windowsill" and with Argus "sitting in his Globetub" while looking through his "Argus scope". In (5), even more situational information is provided when the monastery is introduced as a new setting.

*2.3 Expository texts with narrative characteristics*

Publishers also combine expository and narrative elements in their educational texts. Even though these texts show narrative characteristics, they are different from prototypical narrative exemplars like (4) and (5). For some texts, however, this difference is only marginal, missing only one prototypical narrative element. For instance, (6) is part of a lesson discussing the actions of soldiers during World War I.

(6) Many soldiers wanted to get out of the trenches. The British soldier Thomas James Highgate had a plan. On a day off he took off his uniform, put on ordinary clothes and went off. But he got lost and asked a gamekeeper for directions. This man turned out to be an Englishman, who immediately reported the fled soldier to the British army. On 8 September 1914 Thomas received the death penalty for his attempt to escape.

(*Eigentijds*, history grade 5, p. 15)

In (6), we discover a number of narrative elements. There is a representation of events that are non-randomly connected and particularized, focusing on the landscape of action of two characters, Thomas and the gamekeeper. The text is quite specific with respect to time as well, referring to Thomas' death on 8 September 1914. However, an explicit representation of the characters' landscape of consciousness is missing. While readers get to know the contents of Thomas' plan, they gain no insight into his feelings or thoughts nor those of the gamekeeper, and no speech is represented to reflect on the events. Nevertheless, (6) reads like a story.

While texts about specific characters are not uncommon in history textbooks, many texts explaining historical situations focus on groups rather than individuals. Although these texts often deal with events that happened in a set time and place, as opposed to fully expository texts like (1), their lack of focus on specific events concerning individuals decreases their particularity in comparison with texts like (6). The history text in (7), for instance, sketches the state of the art in ancient Egypt.

(7) Thousands of years ago the climate on earth changed. In many places it became warmer and drier. Egypt changed into a desert. The hunter-gatherers in Egypt migrated to the river Nile, because they found enough to eat there. They succeeded in growing grain. Close to the water they created farmland. They made animals, which became house-trained, graze on higher parts of land. This is how the hunter-gatherers became farmers. That was a huge change.

(*Brandaan*, history grade 5, p. 5)

Example (7) gives a representation of non-specific events, with the Egyptians being depicted as a group and without a focus on particular group members. The Egyptians

are not staged as speaking or thinking characters, and there is no expression of their feelings regarding moving to the River Nile. Interestingly, however, despite this lack in particularization and inner world representation, (7) still has a narrative "feel" to it.

This changes for texts that deal with natural phenomena instead of historical situations. As in (7), the events in (8) are generic rather than particularized. Likewise, no specific characters nor inner worlds are presented. Contrary to (7), however, (8) generates no sense of narrativity.

(8) Coal originated from the Carboniferous marshes. This is how it happened. Dead plants started to rot. The remains of these plants formed a layer of peat. Water washed a layer of sand over it.

(*Grenzeloos*, geography grade 5, pp. 8-9)

While both (7) and (8) fail to satisfy some essential narrativity criteria, (7) is about people and their actions. This human involvement may be why we experience more of a narrative feel reading (7) compared to (8). Since history texts are mainly about human beings and their actions, one could wonder whether all texts in history textbooks exhibit one or more narrative characteristics.

Narrative characteristics are not completely absent in biology and geography textbooks either. The text in (9), from a geography textbook, shows a clear contrast between an expository and a narrative-like way of writing.

(9) It started with a small crack in the rock. Moisture started to grow in it and at some point some seeds. A tree grew from one of those seeds. The roots of that tree penetrated further and further into the crack. And so the crack became wider and deeper. Snow and ice made the crack a little wider every year, because water expands when it freezes. And then one day, this huge piece of rock broke loose and popped down...

Under the influence of plant roots and the weather, rocks crumble all year. This is called erosion. During the winter, the process of erosion often proceeds faster. The water in the cracks and crevices of the mountain freezes and as a result pieces of rock are released. They bounce down the slope and break into smaller pieces. In their fall they take other stones with them. And all those rocks roll into the valley.

(*Meander*, geography grade 5, p. 12)

In (9), the second paragraph provides a description of the to-be-learned information, which is about the general process of erosion. This information is written down in an abstract, non-narrative style, similar to that of the expository text in (1). In the first paragraph, however, the to-be-learned information is introduced by means of some prototypical narrative elements. It presents logically related events that focus on

individualized natural objects (*one* cleft, *one* seed, and *one* tree) instead of the entire group of objects. As such, a landscape of action is sketched. Additionally, the paragraph exhibits some narrative expressions, such as "it started with", the temporal marker "and then one day" and an intensifying "popped down" instead of "fell". A landscape of consciousness, however, is missing. While we almost automatically infer a landscape of consciousness for Thomas and the gamekeeper in (6), we probably will not do this for the non-human objects in (9). This again makes evident that human involvement is an important factor in terms of narrativity. Nonetheless, the first paragraph of (9) has more of a narrative feel to it than its succeeding paragraph.

The addition of human characters is a commonly used narrative intervention in Dutch educational materials. Sometimes this intervention is rather small, as in (10) – presented in the same lesson as (6) –, in which the final sentence mentions a somewhat random soldier as an illustration to the to-be-learned information.

(10) Before soldiers went to the front, they wrote a letter. It explained what should happen if they were to die. This is called a will. George Stanley Peachment donated all his belongings to his mother.

(*Eigentijds*, history grade 5, p. 14)

Human characters can also be more prominent. In (11), a pilot named Tom repeatedly speaks to the readers via short text boxes in a chapter about Europe's landscapes in a geography textbook. Tom tells about his experiences ("I have seen a lot of Europe"), provides factual information ("Europe has more than 50 countries"), and asks questions ("do you know the mountains and waters of Europe?"). Because of his prominence, Tom seems to be "telling" the to-be-learned information in the other texts presented in the chapter as well. However, the addition of specific characters does not result in full narratives in (10) and (11). Both texts lack a clear representation of events. In addition, while Tom could be labeled as a conscious character in (11), because of his prominence and the descriptions of his experiences, George is only indirectly related to the other sentences of (10), without any depiction of his thoughts, beliefs, or desires.

(11)

a. Hi, I am Tom. I am a pilot and make flights throughout Europe. I have seen a lot of Europe.
b. When I fly over Europe, the landscape often shows me where I am.
c. Do you know the mountains and waters of Europe?
d. Europe has more than 50 countries. There are about 70 different languages spoken here. That is why it is good that all pilots and captains have agreed to speak English to each other. Otherwise, misunderstandings would often arise.

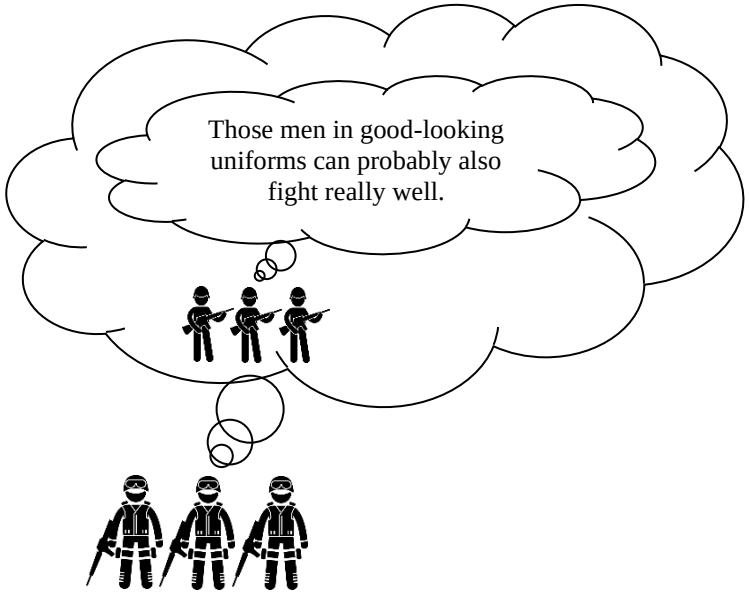
(*Wereldzaken*, geography grade 5, pp. 4-10)

As we have seen in (6) and (10), experiencing human characters can appear without an explicit representation of their landscape of consciousness. Although one would in turn expect a represented inner world to be accompanied by a specific experiencing character, this is not always the case either. Example (12) describes how fashion in the nineteenth century was about impressing one's military opponents. Interestingly, even though a particularization of events and specific characters are lacking in this text, as was the case in (7), we do find a representation of a landscape of consciousness at its ending. This landscape of consciousness demonstrates what the generals would have liked their opponents to think, making the opponents embedded speakers/thinkers of the represented thoughts. This is schematically represented in Figure 1. However, since the generals and opponents represent groups of people, the represented thoughts cannot not be linked to specific individuals.

(12) Generals decided what came into fashion. In the nineteenth century, the most significant soldiers dressed themselves in a blue vest with gold braiding on its front (woven gold thread). They wanted to impress their opponents. They were hoping their opponents would think: "Those men in good-looking uniforms can probably also fight really well."

(*Eigentijds*, history grade 5, p. 12)

**Figure 1.**
Schematic representation of what the generals would have liked their military opponents to think




Taken together, we have seen that Dutch educational materials contain a variety of narrative characteristics, ranging from prototypical narratives to texts that combine expository and narrative features. We will now turn to textual elements that are related to the proximity dimension of vividness, namely elements of voice.

## 3. Strategies of vividness: elements of voice

By giving an educational text a voice, the distance between the reader (i.e., the student) and the educational content is decreased. As was discussed in Section 1, the voice of a text represents the aspects of the text that make it "speak" to the reader (Beck et al., 1995). In Dutch educational materials, this voice surfaces in various ways, often imitating a direct, "here and now" interaction between the author of the text – the voice – and the student.

A common manifestation of an educational text's voice is the direct addressing of students by the use of pronouns, in particular the second-person singular pronoun "you" and its possessive counterpart "your", and the first-person plural pronouns "we" and "our". For instance, in (13), students are addressed with "you" twice and with "we" once.

(13) Perhaps *you* thought that only humans and animals reproduce. However, plants do too. *We* call the parts with which a plant reproduces the reproductive organs. *You* call the male reproductive organ of a flower a stamen.[1]

(*Natuniek*, biology grade 5, p. 8)

In (13), the first "you" has a personal interpretation: it makes sure that students check for themselves whether they were under the impression that only humans and animals can reproduce. The second "you" and the "we" address more of a general audience (cf. Hogeweg & de Hoop, 2015). They state that this is "how one does it". These three pronouns, especially the first "you", make (13) more personal and vivid, decreasing the distance between the to-be-learned information and the student. This becomes particularly apparent when we rewrite (13) into (14).

(14) Just like humans and animals, plants can reproduce. The parts with which a plant reproduces are called reproductive organs. The male reproductive organ of a flower is called a stamen.

Written without pronouns, (14) appears pallid and distant. The text is not personalized, and no attempt is being made to bridge the distance between the educational content and the student. A text can also speak to students via questions, as in (15) and (16).

(15) You call the duration of an animal's pregnancy the gestation period. The gestation period varies from animal to animal. *Did you know* that an elephant is pregnant for twenty-two months and a hamster only for sixteen days?

(*Natuniek*, biology grade 5, p. 12)

(16) *A desert?* You can find them in Africa or Mongolia, for example. And for the tropical rain forest you can, for instance, go to Brazil or Indonesia. Yet there was a time when you also found these landscapes and climates in the Netherlands. *Come along with me* far, far back in time.

(*Grenzeloos*, geography grade 5, p. 8)

The question in (15) is used to convey factual information as well as invite students to reflect on this information ("Did I know this?"). The question in (16) forms a playful introduction to the topic of the text's chapter, which is about the origin of the Netherlands. Like the question in (15), this question stimulates students to think along while processing the information given by the text. Students are also spoken to at the

[1] The italics are ours in examples (13)-(22).

end of (16): by means of an imperative sentence the voice encourages students to actively participate in the succeeding texts of the chapter.

The distance between the educational content and the student can also be decreased by means of evaluative expressions. In (17), the to-be-learned information on Icelandic geysers is concluded with the subjective expression "Very special!" This expression reflects the personal opinion of the text's voice. Similar to (15), such expressions stimulate students to reflect on incoming information ("Do I also believe that it is special to take a bath in geyser water?", "Why is this so special?"). Seeing to-be-learned information in relation to one's own opinions brings it in closer proximity to the student.

(17) A geyser is a heat source. The water is heated underground by geothermal energy: the fire in the middle of the earth. In Iceland, this geothermal energy is not located so deep. In a geyser, the hot water sprays upwards. In other places it flows upwards more peacefully. In these locations, people use the hot water to relax. Taking a nice bath and floating around, while it is freezing. *Very special!*

(*Wereldzaken*, geography grade 5, p. 61)

Evaluative expressions can also take the form of a question, as in (18). This text is part of a lesson on optical illusions, and in the textbook, the text is accompanied by a photo that shows some street art that tricks the eye. Again, the evaluative "Clever, isn't it?" stimulates consideration of what has just been read; students need to reflect on the concept of optional illusions to be able react to the voice's opinion.

(18) The two girls are real, the rest is part of the drawing. And keep in mind: it is just a flat drawing on the sidewalk, so you can walk over it! *Clever, isn't it?*

(*Natuurzaken*, biology grade 5, p. 21)

Another way in which the voice of a text can speak to students is by stimulating them to imagine situations sketched in educational texts. For instance, in (19), students are instructed to imagine themselves as being a farmer during the Charlemagne period. During this imagination, the voice informs the students about the consequences of this farmer-lifestyle. Placing yourself in a historical situation like this, makes the educational content vivid and more accessible.[2] It brings the educational content in closer proximity, and therefore stimulates more involvement during reading than a text that merely tells about life in the Charlemagne period.

[2] Absorption into a new world is also known as "transportation", an effect often brought about by narratives (cf. Green & Brock, 2000).

(19) *Imagine* that you were a farmer in the kingdom of Charlemagne. Then you always had to obey your lord. Because you were a half-bounded farmer or serf, you could not leave his land without permission.
(*Wijzer! Geschiedenis*, history grade 5, p. 55)

Moreover, a way of bringing the educational content in closer proximity to students is to connect it to them by making references to their personal environment. Such connections can be small references to known situations or objects, such as the reference to a commonly known television program in the Netherlands, as in (20). However, they can also be more far-fetched, requiring more imagination on the students' behalf, as in (21). The reference at the end of (21) is not particularly relevant if you do not have an aunt who lives in Australia.

(20) Texts, videos, music and internet pages are rapidly exchanged via fiberglass. You turn on the computer and you watch *the Voice of Holland* on television at exactly the same time that the candidates are singing on stage. How is that possible? The images are sent by means of light!
(*Binnenstebuiten*, biology grade 5, p. 22)

(21) A glass fiber is as thin as a hair. Light can move through it super-fast. The light is reflected in the cable through the glass. As a result, the light signal can go infinitely far: thousands of miles away to *your aunt in Australia*.
(*Binnenstebuiten*, biology grade 5, p. 22)

The text in (22) shows an interesting combination of the above defined elements of voice. In this text, students are invited to come along with the text's voice on a school trip through a forest.[3] This forest is metaphorically introduced as an apartment complex, having different layers. The voice guides the students past all these layers step by step, giving information about the forest and its inhabitants along the way. During the trip, he invites students to imagine themselves in the forest, addresses them with "you" and "we", asks questions ("Do you ever go into the forest?", "Do you know these bushes with white flowers and red berries?"), stimulates to actively participate during the trip ("It's nice, isn't it, that forest air?", "If you listen carefully, you can hear them"), and makes assumptions that connect to the students' personal world ("That is of course why you prefer to stay in the sun"). This vivid way of embedding to-be-learned information in a metaphorical structure elicits student engagement. It is supposed to give students the feeling that they are present in the forest they are reading and learning about, as if they are observing the forest themselves.

[3] We decided to only present the first sentences of each paragraph, because of space limitations.

(22)

a. *Do you ever go into the forest? It's nice, isn't it, that forest air?*
b. In the tropics the sun is very bright and it rains every day. As a result, the tree layer, the top layer of the forest apartment complex, is very high.
c. *If you listen carefully, you can hear them.* The inhabitants of the upper floor of the forest.
d. A big tree dies. As a result, sun rays penetrate through the tree layer. (…) *Do you know those bushes with white flowers and red berries?*
e. We are going further down. Below the tree layer and the bush layer is another floor: the herb layer.
f. Now we have our feet firmly on the ground. The ground floor of the forest flat is called the moss layer.
g. Animals are also adapted to their environment. Animals in the tree layer have claws or long grasping arms.
h. It is cold in the shade. *That is of course why you prefer to stay in the sun.*

(*Argus Clou Natuur en Techniek*, biology grade 5, pp. 12-15)

## 4. Discussion and conclusion

In this chapter, we aimed to gain more insight into the kinds of non-expository textual elements used to make Dutch educational materials for primary school more vivid, focusing on elements of narrativity and voice of a text. Narratives appear to be able to make the content more emotionally interesting and imaginable (cf. Nisbett & Ross, 1980), whereas elements of voice seem to decrease the distance between the content and the reader.

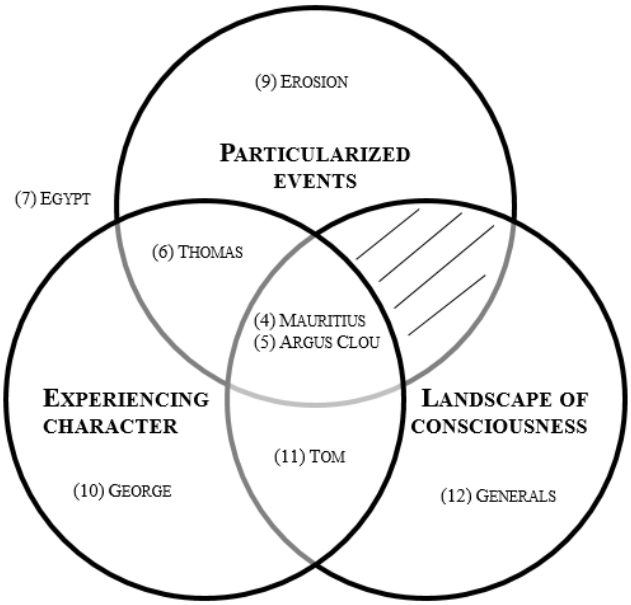
Our analyses have demonstrated that educational texts can be given a voice by imitating a direct, "here and now" interaction between the author of a text – its voice – and the student. The voice of educational texts was shown to communicate with students by directly addressing them with second-person pronouns, as in (13), including references to their personal environment, as in (20), asking questions, as in (15), giving evaluations, as in (18), and providing instructions, as in (19). These textual elements urge students to actively participate in their reading and learning, thereby bringing the educational content in closer proximity to the student.

In view of the concept of narrativity, elements of voice that stimulate students to put themselves in a sketched (historical) situation are particularly interesting. In (19), students are asked to "become" a farmer during the Charlemagne period. Such invitations to "imagine" a certain situation form an instruction to enter a narrative world. In this world, the students themselves are the character around whom the events unfold. These "imagine instructions" not only bring the to-be-learned information in

closer proximity to the students, but also prompt sensory imagery of the educational content. In addition, these instructions are likely to make the educational content more emotionally interesting, with the students themselves playing an active role in the imagined situation. In this way, the three dimensions of vividness come together in instructions to imagine.

Narrativity does, however, not only take shape in instructions. Our analyses have shown that Dutch educational materials contain a wide variety of narrative characteristics, ranging from full-blown narratives to texts that combine expository and narrative features. The Venn diagram in Figure 2 illustrates the fluid character of the narrative(-like) texts we have discussed in Sections 2.2 and 2.3. The texts have been categorized based on their exhibition of narrative elements, with each circle of the Venn diagram representing one prototypical element.

**Figure 2.**
Venn diagram categorizing educational texts based on their exhibition of prototypical narrative elements




In the middle of the Venn diagram, we find our prototypical narratives. These texts, which described the stories of Mauritius in (4) and Argus Clou in (5), exhibited all prototypical narrative elements discussed in Section 2.1, namely 1) the representation of a sequence of non-randomly connected and particularized events, which were 2) experienced by at least one human or humanlike character, of whom 3) we gained insight into the inner world.

The other narrative(-like) exemplars evolve around these narrative prototypes, combining expository and narrative elements in various ways. Some texts were shown to incorporate two prototypical narrative elements, while lacking a third one. For instance, (6) described particularized events experienced by specific characters, Thomas and the gamekeeper, without giving a representation of these characters' inner world. By contrast, (11) presented the consciously involved character Tom, while lacking the representation of a sequence of events.

As the shaded part of the Venn diagram shows, a third option – a representation of particularized events and a landscape of consciousness without the presence of an experiencing character – did not occur in the educational materials under investigation. This seems only logical, since a landscape of consciousness always belongs to someone: the experiencer of the inner world representation. Especially when the events of a text are particularized – focusing on specific events, specific characters, and/or specific settings –, it appears impossible to have a represented inner world without an accompanying experiencing character. A possible exception might be the "story" used by Cervetti et al. (2009) about small rock Sandy (see Section 1), but then with an additional inner world. We would position the original Sandy-text in the "particularized events" area of our Venn diagram, because Sandy is presented as a non-human natural object without any conscious involvement in the texts' events. Being inanimate, Sandy serves as a "character substitute". However, once given thoughts and feelings, one could wonder how much of a character substitute Sandy still is. It can be argued that a represented landscape of consciousness would give Sandy humanlike characteristics, making "her" an experiencing character after all. As such, it appears that even texts about specific natural objects are not to be categorized in the area combining "particularized events" and "landscape of consciousness".

It seems contradictory to find (12) positioned in the "landscape of consciousness" area, when we have just argued that a landscape of consciousness always belongs to someone. It certainly does. However, this someone does not always have to be a *specific* experiencing character. In (12), a group of generals imagined what they would have liked their opponents to think, as was illustrated in Figure 1. Because the represented thoughts were not associated with one single experiencing character, the text does not match our "experiencing character" area. For this reason, we have decided to categorize the text in the "landscape of consciousness" area. Similarly, other educational texts exhibiting only one prototypical narrative element have been located in other outer areas of the Venn diagram (e.g., (9) in "particularized events" and (10) in "experiencing character").

In the primary school materials we analyzed, we did not come across texts that met the "particularized events" and the "landscape of consciousness" requirements without also representing an "experiencing character". However, this absence does not imply that the intersection of our Venn diagram should remain empty. Elaborating

upon the text about the generals that wanted to impress their opponents in (12), we can come up with a more specific continuation, as in (23).

(23) The strategy of good-looking uniforms worked only temporarily. In 1914 WWI started. At the beginning of this war, new weapons entered the arena. These weapons could aim more precisely from a greater distance. The chance of being hit by a bullet on the battlefield became considerably higher. After a number of high-ranked generals was shot dead from afar, the generals became afraid of their enemy instead of the other way around. The generals now thought it would be smarter to make sure that their enemy was not able to see them. This is why, on a bleak autumn day in October 1914, the generals made sketches for a new uniform. In their headquarters, they came up with a design: the good-looking uniform was exchanged for a uniform in camouflage colors.

To make the events in (23) more particularized in comparison to (12), we have mentioned the time during which the events happened ("in 1914"; "on a bleak autumn day in October 1914") and the space in which the events took place ("in their headquarters"). In addition, we have added a concrete action ("they came up with a new design"). This means that, in contrast to (12), the continuation in (23) now contains a specific setting and some particularized events. Similar to (12), (23) lacks an individual experiencing character but represents a landscape of consciousness. We argue that the addition of (23) as a second paragraph to example text (12) would change the positioning of this text in the Venn diagram. To assess whether such texts indeed occur in the educational domain, a large-scale corpus-based analysis of educational texts is needed. For instance, research into longer educational texts, such as those for secondary education, might reveal that it is not so difficult to fill in all sections of the Venn diagram after all.

We have chosen to position (7) about the Egyptians outside the Venn diagram, because it became apparent during our analyses that history texts often evoke a narrative feel, even if they do not exhibit prototypical narrative characteristics. This feel is likely caused by human involvement, as became evident through the comparison of examples (7) and (8). Although an experiencing character and a landscape of consciousness are lacking in (7), there are humans present for whom readers can infer intentions, thoughts, beliefs, feelings, and/or sensory perceptions. By contrast, in (8), there are no humans present for whom readers can construe such an inner world. In line with Norris et al. (2005, p. 544), we find that this "lack of agency dulls the sense of narrative considerably". In addition, human involvement might serve as an explanation for the impression that prototypical narratives are found more often in history textbooks than in textbooks for biology and geography; it seems more logical to include narrative elements in a human context.

Now that we have described the variety of elements of narrativity and voice used to make Dutch educational materials more vivid, a next step is to examine their distribution quantitatively. Do all elements make an important contribution to our educational materials, or are some elements only used occasionally? Quantitative analyses will also shed light upon potential differences in the distribution of non-expository elements for the school subjects under investigation. Is it true that narrative elements are more commonly found in history textbooks? How about elements of voice? Are some elements of voice more frequent than others? And are these elements more frequent in biology and geography textbooks than in history textbooks, because they can serve as a replacement for narrative elements?

In this chapter, we have linked the conceptual notion of vividness to textual elements of narrativity and voice. Both elements have proven to be useful in describing the non-expository elements used in Dutch educational materials. Nevertheless, there are indications that there is more to say about these elements. For instance, we have briefly acknowledged that sometimes additional, non-prototypical narrative elements occur in Dutch educational materials, such as the narrative expressions "it started with" and "and then one day" in the first paragraph of (9). Although such linguistic expressions are not directly associated with our operationalization of the three dimensions of vividness, they are interesting elements to take into account in future research. More detailed analyses are needed to illuminate their role in determining an educational text's level of vividness.

Future research should also reveal whether the three prototypical narrative elements are equally significant in their realization of vividness, and whether there are differences in their contribution to the degree of narrativity of an educational text. A way to examine this is to find out how educational texts with narrative elements are perceived by readers: are prototypical narratives considered more narrative and vivid than texts that combine expository and narrative characteristics? Do readers perceive a contrast between texts that incorporate one prototypical narrative element and texts that exhibit two of them? Is there a difference in how readers perceive texts that only exhibit an experiencing character and how they perceive texts that merely represent particularized events? And what is the exact role of human involvement in terms of narrativity and vividness? By presenting readers with varying textual manipulations, one could find out whether different narrative elements or combinations thereof lead to different outcomes for the perceived sense of narrativity and vividness. In this way, potentially different levels of importance can be established for the prototypical narrative elements.

In addition, the results of our analyses may help us to explain the contradictory results of previous empirical studies on the influence of elements of narrativity on the attractiveness, comprehensibility, and memorability of educational texts. Our analyses enable a well-founded classification of the different manipulations applied in previous research. That is, while we would now classify Romero et al.'s (2005) text

about rescuing oiled seabirds as a prototypical narrative – showing particularized events, an experiencing character, and a landscape of consciousness –, the Sandy text of Cervetti et al. (2009) only scores on the criterion of the particularized events. Linking such differences in manipulation to the effects they have brought about is important in interpreting the impact of narrative elements in the educational domain and allows us to investigate other combinations of these elements in a more conscientious way in future empirical research.

Future empirical research into the attractiveness, comprehensibility, and memorability of vivid elements in educational texts is important. Up to now, it remains unclear whether the addition of vivid elements to educational texts genuinely leads to improvements in these respects. One advantage of adding narrative elements might be that students find it easier to relate themselves to the contents of the text. As with elements of voice, narrative elements might decrease the distance between the student and the educational content, making the to-be-learned information more readily accessible. A related advantage might be that the concrete information provided by narrative elements can serve as a mental "hat rack" to which the more abstract to-be-learned information can be linked. On the other hand, narrative elements in educational texts might lead to unintended effects because too much attention for narrative details might shift students' attention away from the information they actually need to comprehend and learn. In this case, narrative elements act as "seductive details" (cf. Garner et al. 1989; Harp & Mayer, 1998): interesting, but unimportant information that distracts the students from the educational content the author wants to bring across. An accompanying disadvantage might be confusion about learning aims. A text with narrative elements might lead students to think that they are reading the educational text for entertainment rather than for learning. In that case, students might not even consider reading for learning. Future empirical research should reveal whether the potential advantages narrative elements in educational texts outweigh the potential disadvantages.

The present chapter has provided a principled approach to describing the non-expository characteristics of Dutch educational texts for primary school, focusing on textual realizations of the three dimensions of vividness – the content of a text being 1) emotionally interesting, 2) concrete and imagery-provoking, and 3) proximate in a sensory, temporal, or spatial way –, namely elements of narrativity and elements of voice. This research can be taken as a first step in gaining more insight into the attractiveness, comprehensibility, and memorability of vivid elements in educational texts.

# Chapter 3
## Effects of narrativity in educational texts: What do research results tell (not yet)?

This chapter focuses on narrativity in the educational domain. Based on earlier research, we define three prototypical narrative elements (i.e., the presence of particularized events, an experiencing character, and a landscape of consciousness), and present an analytical model, with which we illustrate how varying combinations of these elements occur in Dutch educational materials for biology, geography, and history. Using this model, we then analyze experimental texts from previous studies on the effects of narrativity on text comprehension and recall. We demonstrate that experimental narrative texts nearly always exhibit all three prototypical narrative elements, while their expository counterparts also contain some narrative elements and hence are not purely expository. In addition, we show that no consistent patterns can be found across the results of the selected experimental studies, and that the data at hand therefore do not allow for strong conclusions about the effects of narrativity in educational texts. Finally, we discuss the limitations of previous research as well as the present research and implications for future research.

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## 1. Introduction

Many Dutch students consider their educational texts boring and find them difficult to understand (Inspectorate of Education, 2006, 2017; Land, 2009). Especially in non-language subjects, such as social studies and science, there are strong indications that Dutch educational texts are often too difficult to be read by students independently (Bogaert et al., 2008). This raises the question as to what current Dutch educational texts look like and how they can be made more attractive, comprehensible, and memorable. This is important, since a proper understanding of educational texts is crucial for success at school and during a later career (Bogaert et al., 2008; Jansma et al., 2011).

A first look at Dutch educational texts, which we exemplify by their English translations, shows that these texts are very diverse in their characteristics. In this chapter, we focus on two types of educational texts, namely expository and narrative texts. Traditionally, these text types serve different purposes: while expository texts aim at providing new information, narratives are rather written for entertainment (Weaver & Kintsch, 1991). Expository texts developed for primary or secondary education are also intended to convey new information. This is achieved by the introduction and explanation of new, subject-specific terms and/or concepts, such as the notion "biodiversity" in the biology text in (1).

(1) There are millions of different kinds of beings. This broad variation is called biodiversity. Bio is life and diverse means different. Something lives if it has all or most of these characteristics: reproduce, grow, move, react, breathe, eat, and excrete.

(*Binnenstebuiten*, biology grade 5, p. 9)

Narrative educational texts, on the other hand, do not seem to be used purely for entertainment; rather, they seem to be intended to motivate students and/or place the to-be-learned information in a relevant context, for instance by using a narrative at the beginning of a chapter to introduce its theme. For example, in the history text in (2), a narrative about a prehistoric man named Iugas is used as an introduction to to-be-learned information about the Stone Age and Iceman Ötzi, who lived in this time period. The fictional character Iugas shows many similarities to Ötzi.

(2) The mountain towers high above Iugas. Heavy clouds gather around the top. Just a little while and then the snow will fall. Too early, it is too early. He has to go further. Once he is over the mountain pass, he will be safe. A twinge of pain passes over his face. His chest hurts at the place where an arrowhead is stuck between his ribs. His shoulder hurts, also from an arrow. He was able to pull it out, but the wound still hurts. Iugas has nothing to take care of the wound. He gathers all his strength. Maybe he is still able to get over the mountain. As long as he keeps walking.

(*Speurtocht*, history grade 5, p. 8)

Within the educational domain, an absolute dividing line between the expository and narrative genre is not easily drawn. Rather, it seems that educational texts can be represented on an expository-narrative scale ranging from fully expository texts, such as (1), to fully narrative texts, such as (2). In between, there are texts that combine elements from both genres. For example, in the biology text in (3), to-be-learned information about in vitro fertilization treatment (IVF treatment) is supported by the story of an Indian couple.

(3) The Indian Rajo Devi Lohan gave birth to a healthy daughter. Rajo and her husband had wished for a child for years, but it did not happen. That is why they decided to take an IVF treatment. With this treatment an egg cell and a sperm cell are brought together in a test tube. When they fuse, the fertilized egg is placed in the womb of the woman.

(*Binnenstebuiten*, biology grade 5, p. 44)

In (3), Rajo and her husband can be considered characters. The rationale behind adding narrative elements such as characters to expository texts that explain one or more unfamiliar concepts seems to be that they enliven the text and make its content more imaginable (van Silfhout, 2014; Chapter 2 – Sangers et al., 2020), which should in turn lead to better understanding and recall of the to-be-learned information.

In other domains, the use of narrative elements in expository texts has proven to be effective. For instance, narrative elements have successfully been applied in health communication and journalism to enhance text comprehension and persuasiveness (Boeijinga et al., 2017; van Krieken & Sanders, 2016). However, research in the educational domain shows conflicting results. While some studies show that narrative elements contribute positively to the comprehensibility and memorability of the to-be-learned information (cf. Best et al., 2008; Romero et al., 2005), other studies report negative outcomes (cf. Cervetti et al., 2009; van Silfhout, 2014). A plausible but not yet investigated explanation for these conflicting results is the way in which narrativity has been operationalized in the experimental texts of these studies. These

operationalizations appear to diverge. Therefore, our research questions are as follows:

1. How is narrativity operationalized in previous research into educational texts?
2. To what extent are conflicting genre effects on text comprehension and/or recall caused by differences in these operationalizations?

Before we start our analysis of previous studies, we will first present a definition of narrativity that is applicable in an educational context (Section 2.1). Using an analytical model, we will then show how narrative elements are currently being used in Dutch educational texts for primary education (Section 2.2). Subsequently, the model will guide a corpus-based analysis of genre operationalizations in previous studies and the results that have been reported in these studies, demonstrating that genre operationalizations often diverge and that it is difficult to discover patterns in the reported results (Section 3). Finally, we will discuss the limitations of previous research and the present research, as well as their implications for future research (Section 4).

## 2. Narrativity in educational texts

### *2.1 What is a narrative?*

While most researchers concentrate on a binary interpretation of the concept "narrative" (cf. Abbott, 2008; Toolan, 2001), Ryan (2007) proposes a scalar interpretation that focuses on the question "is text 1 more narrative than text 2?" rather than "is text 1 a narrative?" According to Ryan (2007, p. 28), narratives should be viewed as "a fuzzy set allowing variable degrees of membership, but centered on prototypical cases that everybody recognizes as stories". Based on such a scalar interpretation, a text is most narrative if it contains all prototypical narrative elements. If a text contains some but not all prototypical narrative elements, this text is merely less pronounced narrative than the narrative prototype.

Based on narratological literature, we have defined three narrative elements that can be considered prototypical in an educational context (see Chapter 2 – Sangers et al., 2020), namely 1) a sequence of non-randomly connected particularized events, that are 2) experienced by a specific character, of whom 3) we gain insight into the inner world. We briefly explain these elements, before presenting a model that illustrates how these elements are applied in Dutch educational texts for primary education (see Section 2.2).

First, a prototypical narrative text represents two or more events that are connected in a logical way, for instance by means of causal or temporal relations. These events are particularized rather than generic (compare "Yesterday, Lisa went to the University Hall in Utrecht. After a short speech from her supervisor, she received

her diploma for the master Communication and Organization" versus "Many students graduate from university each year"). Particularization can be reached by referring to at least two specific events that involve specific characters and/or introduce specific settings (i.e., space and time).

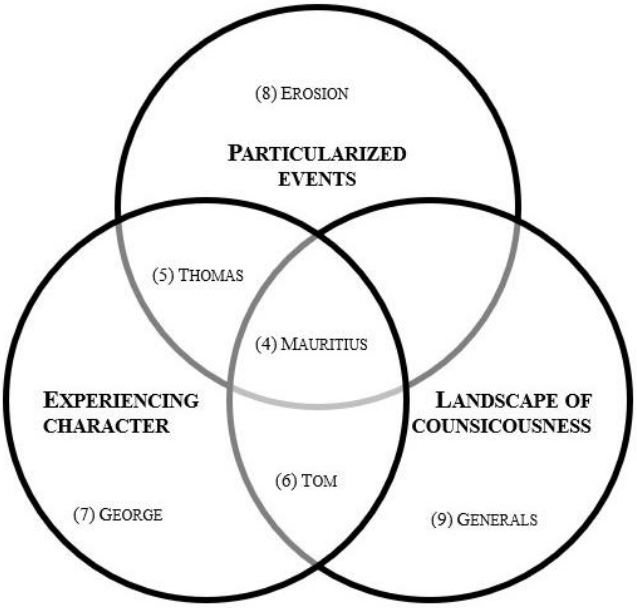
Second, a prototypical narrative contains at least one individual who experiences the events described in the text, either by taking active part in these events or by passively experiencing them. This experiencing character can be human as well as human-like (e.g., an animal).

The third prototypical element of narrative texts is that they should give readers some insight into the character's inner world, the so-called "landscape of consciousness", through the expression of thoughts, feelings, and/or sensory perceptions (Bruner, 1986). This landscape of consciousness is complementary to the narrative text's "landscape of action", which is the relationship between the actions of a character and their consequences. If a landscape of consciousness is not explicitly elaborated upon in a text, readers should infer the inner world of the character themselves.

*2.2 Narrative elements in educational texts*

In a prior study, we have demonstrated that the three prototypical narrative elements mentioned in Section 2.1 are applied in varying combinations in Dutch biology, geography, and history texts for grade 5 (see Chapter 2 – Sangers et al., 2020). This variation in degree of narrativity can be illustrated by an analytical model, in the form of a Venn diagram (see Figure 1). In Figure 1, each circle represents one of the prototypical narrative elements. As can be seen in the diagram, a representative educational text was found for almost all possible combinations of the three prototypical narrative elements.

**Figure 1.**
Venn diagram categorizing educational texts based on their exhibition of prototypical narrative elements




In Dutch educational materials, prototypical narrative texts appear to be most commonly found in history textbooks. The history text in (4), for instance, exhibits all prototypical narrative elements: a series of non-randomly connected particularized events is represented, that focuses on a specific character – Mauritius –, of whom we gain insight in the inner world through the expression of his opinion ("Mauritius approves of this plan"), feelings ("Mauritius is terribly shocked"), and thoughts ("After all, the empire needs order and peace!", "What should he do?").

(4) Army commander Mauritius has trouble falling asleep. Tomorrow, he and his troops will be travelling to Gaul, to quell a rebellion. Mauritius approves of this plan. After all, the empire needs order and peace! However, the emperor has given an additional order: Mauritius has to kill all the Christians in the area. Mauritius is terribly shocked: he is a Christian himself, just like his soldiers. What should he do? The following days he cannot think of anything else. When they arrive in Gaul, he has made up his mind: Mauritius and his men refuse to kill the Christians. The emperor is furious about his disobedience and, as a punishment, gives the order to assassinate Mauritius and his soldiers. Many years later, the church decided to canonize Mauritius as a **saint**. People started to worship and depict him.
(*Wijzer! Geschiedenis*, history grade 5, p. 43)

Besides prototypical narratives, we encounter educational texts that contain only one or two prototypical narrative elements. For instance, one prototypical element is lacking in the history text in (5).

(5) Many soldiers wanted to get out of the trenches. The British soldier Thomas James Highgate had a plan. On a day off he took off his uniform, put on ordinary clothes and went off. But he got lost and asked a gamekeeper for directions. This man turned out to be an Englishman, who immediately reported the fled soldier to the British army. On 8 September 1914 Thomas received the death penalty for his attempt to escape.

(*Eigentijds*, history grade 5, p. 15)

Text (5) represents a series of non-randomly connected particularized events, focusing on the landscape of action of two characters: a soldier named Thomas and a gamekeeper. The text is quite specific with respect to time as well, referring to the soldier's death on 8 September 1914. However, an explicit representation of the characters' landscape of consciousness is lacking. While students get to know the contents of Thomas' plan, they gain no insight into his thoughts or feelings regarding his attempted escape. Students have to make inferences about these thoughts and feelings themselves. In addition, students gain no insight into the landscape of consciousness of the gamekeeper, and no speech is represented to reflect on the described events. Nonetheless, (5) reads like a story. Based on the two prototypical narrative elements that are present in (5), this text is positioned at the intersection between "particularized events" and "experiencing character" in the Venn diagram.

The geography text in (6) is also positioned at an intersection of two prototypical elements. In this text, we find an experiencing character as well as a landscape of consciousness, while a representation of non-randomly connected particularized events is lacking.

(6)

a. Hi, I am Tom. I am a pilot and make flights throughout Europe. I have seen a lot of Europe.
b. When I fly over Europe, the landscape often shows me where I am.
c. Do you know the mountains and waters of Europe?
d. Europe has more than 50 countries.

(*Wereldzaken*, geography grade 5, pp. 4-10)

In (6), pilot Tom repeatedly speaks to students via short text boxes in a chapter about Europe's landscapes. Tom tells about his experiences ("I have seen a lot of Europe"), provides factual information ("Europe has more than 50 countries"), and asks questions ("do you know the mountains and waters of Europe?"). Because Tom is

frequently present throughout the chapter, he seems to be "telling" the educational content of the other texts presented in the chapter as well. Because of his prominence as a speaking individual, Tom can be considered a "conscious" character. Even though Tom reports about his experiences as a pilot, his experiences are not described through a sequence of non-randomly connected particularized events.

As (4), (5), and (6) illustrate, the addition of an experiencing character is a commonly used narrative intervention in educational texts. Sometimes, however, this intervention is rather small; in the final sentence of the history text in (7), a somewhat random soldier is mentioned to make the to-be-learned information more concrete, without describing a sequence of logically related particularized events or expressing a landscape of consciousness.

(7) Before soldiers went to the front, they wrote a letter. It explained what should happen if they were to die. This is called a will. George Stanley Peachment donated all his belongings to his mother.

(*Eigentijds*, history grade 5, p. 14)

Likewise, only one prototypical narrative element is represented in the geography text in (8), namely a representation of a sequence of non-randomly connected particularized events. In this text, we can identify a clear contrast between an expository and a narrative way of transferring to-be-learned information.

(8) It started with a small crack in the rock. Moisture started to grow in it and at some point some seeds. A tree grew from one of those seeds. The roots of that tree penetrated further and further into the crack. And so the crack became wider and deeper. Snow and ice made the crack a little wider every year, because water expands when it freezes. And then one day, this huge piece of rock broke loose and popped down...

Under the influence of plant roots and the weather, rocks crumble all year. This is called erosion. During the winter, the process of erosion often proceeds faster. The water in the cracks and crevices of the mountain freezes and as a result, pieces of rock are released. They bounce down the slope and break into smaller pieces. In their fall, they take other stones with them. And all those rocks roll into the valley.

(*Meander*, geography grade 5, p. 12)

In (8), the second paragraph provides a description of the educational content, which is about the general process of erosion. This information is written down in an abstract, non-narrative style, similar to that of the expository text in (1). Interestingly, the educational content is introduced in a narrative way in the first paragraph of (8). This paragraph presents logically related particularized events that focus on individualized

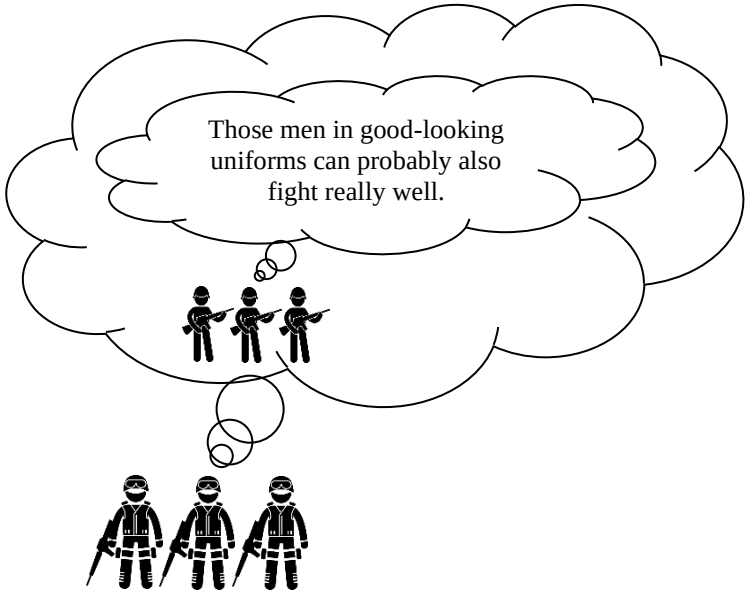
natural objects (*one* cleft, *one* seed, and *one* tree) instead of the entire group of objects. As such, a landscape of action is sketched. However, a landscape of consciousness is lacking. While we almost automatically infer a landscape of consciousness for soldier Thomas and the gamekeeper in (5), this is less obvious for the non-conscious objects in (8). Normally, readers will not infer thoughts and/or feelings for non-conscious objects. This indicates that human involvement is an important factor in the degree of narrativity of educational texts.

Finally, in (9), we only find the representation of a landscape of consciousness, without it being linked to a specific character. This text describes how fashion in the nineteenth century centered around impressing one's military opponents. Interestingly, the ending of (9) contains an explicit representation of a landscape of consciousness ("Those men in good-looking uniforms can probably also fight really well"), even though particularized events and specific characters are lacking. The landscape of consciousness demonstrates what the generals would have liked their opponents to think, making these opponents embedded thinkers of the represented wish/thought, as is depicted in Figure 2. However, since the generals and opponents are represented as groups of people, and no individuals are highlighted, the landscape of consciousness cannot be linked to a specific experiencing character. This is why (9) is classified on the right side of the "landscape of consciousness" circle, the last area that can be filled in the diagram in Figure 1. Although one area of the Venn diagram remains empty on the basis of Dutch biology, geography, and history texts for grade 5 – the intersection between "particularized events" and "landscape of consciousness" –, we have illustrated that this area can potentially be filled as well (see Chapter 2 – Sangers et al., 2020).

(9) Generals decided what came into fashion. In the nineteenth century, the most significant soldiers dressed themselves in a blue vest with gold braiding on its front (woven gold thread). They wanted to impress their opponents. They were hoping their opponents would think: "Those men in good-looking uniforms can probably also fight really well."

(*Eigentijds*, history grade 5, p. 12)

**Figure 2.**
Schematic representation of what the generals would have liked their military opponents to think




## 3. Analysis of previous studies

In the previous section, we have demonstrated that the three prototypical narrative elements from Section 2.1 occur in varying combinations in Dutch biology, geography, and history texts for grade 5. After we have described our research method (Section 3.1), we examine the extent to which the narrative texts from selected effect studies exhibit the three prototypical narrative elements from the literature (Section 3.2.1), and investigate the extent to which the expository texts from these studies are fully expository (Section 3.2.2). Subsequently, in light of these textual analyses, we aim at explaining the genre effects reported in the considered studies (Section 3.3).

### *3.1 Method*

#### *3.1.1 Selection of studies*

We searched through three scientific databases for experimental studies that give insight into the effects of narrativity on text comprehension and/or recall. We focused on studies that compared narrative and expository texts, with both text genres conveying similar educational content. In the databases, we searched for a combination of the terms “narrative and expository text”, “genre effects”, “comprehension”, and “recall”. This yielded ten hits in ERIC, 7708 hits in PsycInfo, and 21900 hits in Google Scholar. To make the assessment of the studies workable,

we went through the first 50 hits in Google Scholar, and considered hits with three or more out of five stars on a scale indicating the studies' relevance in PsycInfo (77 hits).

Of the remaining 137 hits, we evaluated the abstract and the method section on a number of selection criteria. Studies were not selected if 1) no empirical research was reported, 2) neither comprehension nor recall were among the dependent variables, 3) the narrative and expository texts discussed different topics rather than being versions of the same educational content (e.g., Best et al., 2008), and/or 4) participants did not read the experimental texts themselves but were read to (e.g., Kraemer et al., 2012). For these reasons, a total of 127 studies were left out of the analysis. Finally, four studies were eliminated because their full publication, and hence their method section, was inaccessible. Consequently, we were unable to make a deliberate assessment of the relevance of these studies.

In total, the database search yielded six relevant studies (all published after 2000), namely those of Cervetti et al. (2009), Eng (2002), Kim (2017), Romero et al. (2005), Wolfe and Mienko (2007), and Wolfe and Woodwyk (2010). Since Kim (2017) and Wolfe and Woodwyk (2010) used the experimental texts from Wolfe and Mienko (2007), these texts were included only once in the textual analyses, with reference to the original authors. The results from the studies by Kim (2017) and Wolfe and Woodwyk (2010) were, however, included in the analysis of the reported genre effects (see Section 3.3). The selection of six studies were complemented by a study that came from our own collection, namely that of van Silfhout (2014). This study was conducted in the Netherlands, while the others were executed in the United States.

The seven selected studies contained 26 experimental texts, of which twelve were identified by the respecting author(s) as expository, and fourteen as narrative (see Table 1). Not all studies compared the same number of expository and narrative texts. For instance, Wolfe and Mienko (2007) compared one narrative text with two versions of an expository text, namely a version in which the content was presented in a spatial/temporal/causal order (sequential text), and a version in which the same content was presented by way of three topics (topical text). By contrast, van Silfhout (2014) compared one expository text with a historical narrative containing relevant narrative information and a fictitious narrative that included little relevant narrative information. In addition, the target group of the studies varied from students in primary education (Cervetti et al., 2009; Romero et al., 2005), to students in secondary education (van Silfhout, 2014), and undergraduates (Eng, 2002; Kim, 2017; Wolfe & Mienko, 2007; Wolfe & Woodwyk, 2010).

Table 1 also indicates whether the experimental texts were fully or only partially available for analysis, and shows the dependent variables that were considered per study. In addition to genre effects on text comprehension and/or recall, some studies examined effects on perceived text comprehension and/or text appreciation.

**Table 1.**
Characteristics of the experimental texts from the selected effect studies

| Effect study | Title | Genre (as identified by author(s)) | Text | Dependent variables |
|---|---|---|---|---|
| Cervetti et al. (2009) | *Snail Tales* | expository | part | comprehension, recall, appreciation |
| | *Gail's Snail Tale* | narrative | full | |
| | *From Rocks to Sand* | expository | part | |
| | *Sandy's Journey…* | narrative | part | |
| Eng (2002) | *Dibs-E* | expository | full | comprehension, perceived |
| | *Dibs-N* | narrative | full | |
| | *Play Therapy-E* | expository | full | comprehension, recall, appreciation |
| | *Play Therapy-N* | narrative | full | |
| | *Background page-E*[1] | expository | full | |
| | *Background page-N* | narrative | full | |
| Romero et al. (2005) | *Gorillas-E* | expository | part | comprehension, recall, appreciation |
| | *Gorillas-N* | narrative | part | |
| | *Birds-E* | expository | part | |
| | *Birds-N* | narrative | part | |
| van Silfhout (2014) | *From factory to school-E* | expository | full | comprehension, perceived |
| | *From factory to school-NH* | narrative (hist.) | full | |
| | *From factory to school -NF* | narrative (fict.) | full | comprehension, appreciation |
| | *Netherlands in crisis-E* | expository | full | |
| | *Netherlands in crisis -NH* | narrative (hist.) | full | |
| | *Netherlands in crisis -NF* | narrative (fict.) | full | |
| | *Rembrandt-E* | expository | full | |
| | *Rembrandt-NH* | narrative (hist.) | full | |
| | *Rembrandt-NF* | narrative (fict.) | full | |
| Wolfe & Mienko (2007) | *Alex' adventure* | narrative | full | recall |
| | *Circulatory system-ES* | expository (seq.) | full | |
| | *Circulatory system-ET* | expository (top.) | full | |

*3.1.2 Method of analysis*

We analyzed how and to what extent the three prototypical narrative elements from Section 2.1 are applied in the 26 experimental texts from Table 1. The prototypical narrative elements were defined as follows:

- A text contained **particularized events** if it described events that took place only once – at one point in time and at one location –, as opposed to events that were not connected to a specific time (compare "In 1874, the Dutch liberal politician van Houten announced a bill that forbade child labor for children younger than twelve years old" versus "At the end of the nineteenth century, the number of children who worked in factories decreased"). The

[1] The expository and narrative versions of the text *Background page* are originally from Satterfield et al. (2000), a study that did not match our selection criteria, since neither comprehension nor recall was measured.

particularization of the described events could be strengthened by explicit mention of time and place, but this was no requirement.

- A text contained a **specific character** if an experiencing individual was represented in the text ("During the week, John had to work in the factory"). This individual could also be human-like (e.g., an animal). Human or human-like groups did not count as a specific character ("During the week, the children had to work in the factory").
- A text contained a **landscape of consciousness** if a representation of speech, thoughts, feelings, and/or wishes was given. Thoughts could be expressed in direct speech ("John was thinking: 'I have to go back to the factory today'"), indirect speech ("John was thinking that he had to go back to the factory today"), or free indirect speech ("It was such an unpleasant day again. John had to work in the factory"). A landscape of consciousness did not have to be linked to a specific character; a text could also give insight into the inner world of a group ("The children hated working in the factory").

To ensure reliability, the experimental texts were scored by two independent coders (particularized events $\kappa$=1.00; experiencing character $\kappa$=.92; landscape of consciousness $\kappa$=.90). Disagreements were easily resolved by consultation. Below we report the outcomes that were reached after agreement.

*3.2 Textual analyses*

Table 2 indicates the extent to which the three prototypical narrative elements were found in the two genres. In the next sections, we discuss these outcomes per genre.

**Table 2.**

Number (and percentage) of texts per genre with narrative elements

| Genre | Particularized events | Experiencing character | Landscape of consciousness |
|---|---|---|---|
| Narrative (*N*=14) | 13 (93%) | 13 (93%) | 13 (93%) |
| Expository (*N*=12) | 5 (42%) | 2 (17%) | 6 (50%) |

*3.2.1 Narrative texts*

Most narrative texts – as identified by the original researchers – contain all three prototypical narrative elements. For instance, in (10), we found particularized events (e.g., "Rembrandt and Johannes walked to the building where the painting was hanging"), specific characters (Rembrandt, Johannes), and an insight into a landscape of consciousness ("I am very proud", "Rembrandt was very proud"). Although (10) does not mention a specific point in time – the moment at which the events take place can only be deduced by adding 35 years to Rembrandt's date of birth –, the text does give an explicit indication of place ("the *Doelenzaal* of the *Kloveniersdoelen* in Amsterdam").

(10) 35-year-old Rembrandt van Rijn was walking through Amsterdam with his friend Johannes. Rembrandt liked to talk about the paintings he made. “I am very proud of one painting in particular, and that is the Night Watch”, he told Johannes. (…) Rembrandt and Johannes walked to the building where the painting hang. (…) Rembrandt was very proud of it. (…) The group portrait hang in the *Doelenzaal* of the *Kloveniersdoelen* in Amsterdam.

(*Rembrandt-NH*)

Text (11) is the only narrative text that does not describe particularized events. This text is descriptive; only factual information about director Mushenzi and his duties as protector of the mountain gorillas is provided. Similar to (10), the character’s age does not form a specific indication of time. However, a specific place is mentioned in (11): the Virunga National Park in Congo.

(11) Norbert Mushenzi is the director of the Virunga National Park. This park is located in the country of Congo, Africa. He works with many park rangers to protect the mountain gorillas. (…) Mushenzi is forty-eight years old, and was raised just outside the north end of the park.

(*Gorillas-N*)

During the analysis, we discovered variation in the types of characters used in the narrative texts. For instance, not all specific characters are humans such as Rembrandt in (10) and Mushenzi in (11). In (12), a snail named Gail acts as an experiencing individual.

(12) Deep in the soil, the shell of an egg broke open. Out came a brand-new snail named Gail. Gail quickly ate the eggshell but she was still hungry. Slowly, she dug out of the soil.

(*Gail’s Snail Tale*)

Noteworthy in this context is (13), in which a small rock named Sandy is picked up by a wave, and eventually – caused by the process of erosion – ends up as a tiny grain of sand. Since Sandy is a lifeless object of nature, we cannot classify “her” as a traditional character. Sandy is more of a “character replacement”, a “semi-hominoid”. For this reason, we have classified (13) as the only narrative text in which a specific character is lacking.

(13) One of the waves picked Sandy up. The rocks inside the wave crashed against Sandy and each other. Bit by bit, pieces broke off from Sandy. Finally, all that was left of Sandy was a tiny grain of sand.

(*Sandy's Journey to the Sea*)

Narrative texts containing human characters do not necessarily contain realistic contexts. For instance, in (14), educational content about the circulatory system is conveyed by means of a story about a young man, Alex, who travels through the blood vessels of an unnamed woman.

(14) Alex worked for many years on a machine that would allow him to become tiny. One day, he finally finished the machine and made himself tiny. He was so light that he could fly. When passing by a woman, Alex got sucked into her lungs. He held on to an oxygen molecule that had also entered the lungs. The molecule was absorbed into a red blood cell in the blood. He wanted to find a way back outside.

(*Alex' adventure*)

In addition, the to-be-learned information about Rembrandt in (15) is told from a contemporary perspective rather than from a historical setting, as in (10). In this text, the fictitious characters Daan and his father make their appearance.

(15) "Hey dad, we didn't go to the Rijksmuseum during spring break, because it was still being renovated. But now it is open again. Why don't we go today?", the fourteen-year-old Daan asked his father. (…) His father was enthusiastic straight away: "Let's go there together. The Night Watch by Rembrandt van Rijn is world famous."

(*Rembrandt-NF*)

Almost all narrative texts contain a landscape of consciousness, except (13).[2] In some texts, this landscape of consciousness is more elaborate than in others. The way in which the inner world is described also varies from text to text. For example, in (16), we found several representations of thoughts ("Petrus had troubled thoughts") and feelings ("proudly", "laughed"), while in (14), only the wish "He wanted to find a way back outside" could be ascribed to Alex' inner world. In addition, in half of the narrative texts, one or more characters are speaking. Text (17) is even described

[2] *Sandy's Journey to the Sea* was one of the texts that was not made available to us in full version. It is possible that thoughts and/or feelings were given to small rock Sandy in the remainder of the text.

entirely from the first-person perspective of character Sharon, while an anonymous I-narrator is speaking in (18).

(16) Petrus Regout, a wealthy factory manager, bought a large glass factory in Maastricht in 1838. He needed many workers to keep it going. Petrus had troubled thoughts: "Where do I find this many workers?" But this turned out the be easier than he thought. (…) Petrus' factory was surrounded by twenty other factories. "Mine is the biggest", he said proudly. "I have never made as much profit as I did this year", he laughed.

(*From factory to school-NH*)

(17) My name is Sharon and I live in the Humboldt Bay area in the north of California. Like many other people, I work to help oiled seabirds. I decided to volunteer after I watched the news on television one night.

(*Birds-N*)

(18) Tommy held my hand as we walked towards the play therapy room. Tommy would be my 100th case as a psychologist doing play therapy. Since play is his natural medium for self-expression, the child is given the opportunity to play out his accumulated feelings of tension, frustration, insecurity, aggression, fear, bewilderment, confusion. In being given a nondirective atmosphere, Tommy would have the opportunity to experience his feelings under favorable conditions.

(*Play Therapy-N*)

The text analyses above show that the majority of narrative texts from the selected effect studies contain all prototypical narrative elements, and therefore, can be classified as the narrative extremes on a scale ranging from expository to narrative. Only two out of the fourteen narrative texts lack one or more narrative elements.

*3.2.2 Expository texts*

Half of the expository texts were found to contain prototypical narrative elements as well. Although some texts are fully expository because they merely give a description of features, as in (19), or describe recurrent events, as in (20), others contain particularized events. For instance, in (21), general information on oil pollution is particularized by the mention of a specific oil spill. The specificity of the described events is strengthened by the explicit mention of time ("1999") and place ("Humboldt Bay").

(19) Virtually all kinds of animals have a circulatory system. One function of the circulatory system is to deliver oxygen to the cells of the body. Another function is to remove carbon dioxide from the cells. The three main components of the circulatory system are the heart, blood vessels and blood.

(*The circulatory system-ES/ET*)

(20) The waves pick up these rocks and other rocks from above the tide line. The force of the water is so strong that rocks are thrown against one another. As rocks hit one another, they break apart.

(*From rocks to sand*)

(21) Large cargo ships transport fuel oil. They pose a constant threat to seabirds. These ships spill large amounts of oil when accidents occur. The result is a type of pollution that damages the marine habitat. (…) In 1999, a cargo ship spilled 5,000 gallons of fuel oil. Dozens of volunteers felt compelled to help oiled seabirds. The spill took place near their homes in Humboldt Bay.

(*Birds-E*)

Texts (19)-(21) also differ with respect to human involvement. While no people feature in (19) and (20), a group of volunteers is committed to help the seabirds in Humboldt Bay in (21). Only two expository texts involve a specific character, such as Rembrandt in (22) – the expository counterpart of (10) and (15). It is striking that this expository text exhibits all three prototypical narrative elements: besides the specific character Rembrandt, the text contains particularized events ("In 1638, he commissioned the painting", "At a young age, Rembrandt exchanged his birthplace Leiden for the richer and larger Amsterdam") as well as an insight into Rembrandts landscape of consciousness ("He wanted to become a rich and famous painter"). Similarly, the expository text *Dibs* in (23) contains all narrative elements: a specific I-narrator (an unnamed school psychologist) expresses his thoughts (landscape of consciousness) by citing particularized events that are connected to the case of a boy named Dibs.

(22) The painting showed the riflemen around their captain Banning Cocq. In 1638, he commissioned the painting. (…) At the time he was commissioned by Banning Cocq, Rembrandt was already a well-known painter. At a young age, Rembrandt had left his birthplace Leiden for the richer and larger Amsterdam. He wanted to become a rich and famous painter.

(*Rembrandt-E*)

(23) Another possible characteristic of a behavior disordered child might be his desire to remain passive and not do anything. I recall that Dibs sat under the table, almost completely out of sight. The other children engaged in Show and Tell, listened to the teacher tell a story and sang a few songs. He stayed under the table until morning circle broke up and the children went to other activities.

(*Dibs-E*)

Since history is mainly about people and their actions, one often comes across human involvement in history texts. For this reason, it is not incongruous that Rembrandt – an important historical figure in the educational content – is an experiencing character in (22). By contrast, in texts on more generic history topics, such as child labor (*From factory to school*) and the Great Depression in the Netherlands (*Netherlands in crisis*), groups of people ("children", "the government") are mentioned rather than individuals. Human involvement is not entirely lacking in science texts either; groups of people are found in two out of six expository science texts, namely *Birds* and *Gorillas*.

In addition to particularized events and human involvement, readers regularly gain insight into a landscape of consciousness. Occasionally, this concerns the inner world of a specific character, as is the case with Rembrandt in (22), or that of a group representative, such as the child in (24), whom is assigned a thought via free indirect speech ("What is this all about?"), as well as feelings ("He is suspicious", "He is curious"). In most cases, however, we find the representation of a landscape of consciousness of a group. For instance, in (25), a group of factory managers is given a thought in free indirect speech, which can be made explicit by a paraphrase test: "The managers started to acknowledge that it was smarter to send the children to school first, because this way – so they thought – the children would at least learn how to read and write."

(24) It [= non-directive play therapy] is a unique experience for a child suddenly to find adult suggestions, mandates, rebukes, restraints, criticisms, disapprovals, support, intrusions gone. They are all replaced by complete acceptance and permissiveness to be himself. No wonder the child, during his first play contact, often expresses bewilderment. What is this all about? He is suspicious. He is curious.

(*Play therapy-E*)

(25) From 1880 onwards, child labor became more and more criticized across the country. (…) The factory managers started to acknowledge that it was smarter to wait for children to finish primary school first. This way, the children would at least learn how to read and write. This made them more profitable.

(*From factory to school-E*)

As with the narrative texts, the extent to and the way in which a landscape of consciousness is elaborated upon differs from text to text. This elaboration is not invariably detailed, but rather regularly involves small interventions, such as the brief mention of feelings or wishes, as in the sentences "The volunteers felt compelled to help oiled seabirds" in (21) and "He wanted to become a rich and famous painter" in (22).

Our analyses show that not all expository texts of the selected effect studies can be considered fully expository. Half of the texts contain one or more prototypical narrative elements, with "particularized events" and "landscape of consciousness" as the most commonly used combination. It is striking that the expository *Rembrandt*-text in (22) even contains all three prototypical narrative elements, and hence shows no deviation in manipulation from its narrative counterparts in (10) and (15). The same holds true for the *Dibs*-text in (23). This shows that, even if texts are classified as "expository" by the original researchers, they sometimes belong to the narrative extreme of the expository-narrative scale.

*3.2.3 Overview of narrative elements in effect studies*

Table 3 gives an overview of the prototypical narrative elements that are applied in the narrative and expository texts from the selected effect studies. On the right-hand side of the table, the difference in number of narrative elements between the two genres is given on a scale ranging from 0 to 3: the manipulation distance. Table 3 indicates that for three themes, the manipulation distance is large (3). For example, Cervetti et al. (2009) contrasted a fully expository text about *Snails* – without prototypical narrative elements – with a fully narrative equivalent, containing all elements. In contrast, no manipulation distance between the expository and narrative genre is found for two themes. For instance, van Silfhout's (2014) expository *Rembrandt*-text as well as its two narrative counterparts contain all three prototypical narrative elements. For six themes, there is some but no maximum manipulation distance between the two genres (1-2).

**Table 3.**
The presence of particularized events (PE), an experiencing character (EC), and a landscape of consciousness (LoC) in the expository (E, sequential ES, topic ET) and narrative texts (N, fictitious NF, historical NH) from the effect studies, including manipulation distance

| Effect study | Theme | Genre | PE | EC | LoC | Manipulation distance |
|---|---|---|---|---|---|---|
| Cervetti et al. (2009) | Snails | E | – | – | – | 3 |
| | Snails | N | + | + | + | |
| | Formation of sand | E | – | – | – | 1 |
| | Formation of sand | N | + | – | – | |
| Eng (2002) | Dibs | E | + | + | + | 0 |
| | Dibs | N | + | + | + | |
| | Play therapy | E | – | – | + | 2 |
| | Play therapy | N | + | + | + | |
| | Background | E | – | – | – | 3 |
| | Background | N | + | + | + | |
| Romero et al. (2005) | Gorillas | E | – | – | – | 2 |
| | Gorillas | N | – | + | + | |
| | Birds | E | + | – | + | 1 |
| | Birds | N | + | + | + | |
| van Silfhout (2014) | Crisis in the Netherlands | E | + | – | + | 1 |
| | Crisis in the Netherlands | NF | + | + | + | |
| | Crisis in the Netherlands | NH | + | + | + | |
| | Child labor | E | + | – | + | 1 |
| | Child labor | NF | + | + | + | |
| | Child labor | NH | + | + | + | |
| | Rembrandt | E | + | + | + | 0 |
| | Rembrandt | NF | + | + | + | |
| | Rembrandt | NH | + | + | + | |
| Wolfe & Mienko (2007) | Circulatory system | ES | – | – | – | 3 |
| | Circulatory system | ET | – | – | – | |
| | Circulatory system | N | + | + | + | |

*3.3 Genre effects*

Table 4 lists the genre effects reported in the selected studies by manipulation distance (3-0). The effects reported in the studies by Kim (2017) and Wolfe and Woodwyk (2010) were added to the *Circulatory system* theme in bold and italics, respectively, because these authors used experimental texts that were highly similar to the ones of Wolfe and Mienko (2007).

There are two ways in which we can discover general patterns in the genre effects given in Table 4. First, we can try to relate the effects to the manipulation distance (0-3). The larger the distance between the narrative and the expository genre, and thereby the clearer the contrast between the two, the greater the chance of finding

genre effects should be. Second, we can try to relate the effects to the occurrence of specific prototypical narrative elements, and combinations thereof.

**Table 4.**
Manipulation distance per theme (3-0) coupled with the effects on comprehension, perceived comprehension, recall, and appreciation for the expository (E) and narrative texts (N, fictitious NF, historical NH)

| Manip. distance | Theme | Comprehension | Perceived comprehension | Recall | Appreciation |
|---|---|---|---|---|---|
| 3 | Snails | E = N | – | E = N | E = N |
| 3 | Circulatory system | **E = N**[3] | – | E = N<br>*E < N*,<br>*E > N* | – |
| 3 | Background | E = N | E = N | E = N | E = N |
| 2 | Play therapy | E < N | E < N | E = N | E = N |
| 2 | Gorillas | E = N | – | E < N | E = N |
| 1 | Formation of sand | E > N | – | E > N | E = N |
| 1 | Birds | E = N | – | E < N | E = N |
| 1 | Child labor | E = NH,<br>E > NF | E > NH,<br>E = NF | – | E = NF = NH |
| 1 | Crisis in the Netherlands | E = NH,<br>E > NF | E > NH,<br>E = NF | – | E = NF = NH |
| 0 | Dibs | E < N | E < N | E < N | E = N |
| 0 | Rembrandt | E = NH,<br>E > NF | E > NH,<br>E = NF | – | E = NF = NH |

Looking at manipulation distance, no clear patterns can be discovered, except for the consistent lack of genre effects for text appreciation. Contrary to our expectations, a large manipulation distance generated hardly any genre effects. Only Wolfe and Woodwyk (2010) found effects in this respect (*Circulatory system* theme). However, the direction of the genre effects differed per measure. In a free recall task, the overall recall of text elements was greater in the narrative genre, while participants remembered more educational content in the expository genre. Likewise, contrastive effects were found in a sentence recognition task.

Clear patterns are also lacking for a smaller manipulation distance. For instance, for experimental texts with a manipulation distance of 1, Romero et al. (2005) found better recall for the narrative genre than the expository genre (*Gorillas* theme and *Birds* theme), while Cervetti et al. (2009) discovered the opposite effect (*Formation of sand* theme). Meanwhile, genre effects were found when there was no difference

[3] We only considered results from Kim (2017) that did not display effects of the mediating factor native language, since mediated effects cannot be purely ascribed to the factor genre.

in number of narrative elements. For example, for the *Dibs* theme, Eng (2002) found better (experienced) text comprehension and recall for the narrative text compared to the expository text, while both texts contained all prototypical narrative elements.

Looking at the occurrence of specific narrative elements or specific combinations thereof, clear patterns appear to be lacking as well. For instance, for both the *Gorillas* theme and the *Birds* theme, Romero et al. (2005) found better recall for the narrative genre in comparison to the expository genre, while the combination of narrative elements diverged. Conversely, the same combination of narrative elements did not result in consistent genre effects. For example, in the expository texts for the themes *Birds*, *Crisis in the Netherlands* (van Silfhout, 2014), and *Child labor* (van Silfhout, 2014), only the narrative element "specific character" was lacking. For the themes *Crisis in the Netherlands* and *Child labor*, this generated better text comprehension for the expository genre, while the comprehension of the *Birds* theme was the same across genres.

## 4. Discussion and conclusion

The purpose of this study was twofold, namely to 1) chart the ways in which narrativity has been operationalized in studies examining genre effects on text comprehension and/or recall, and 2) investigate the extent to which these operationalizations explain the conflicting genre effects reported in these studies. An extensive literature search in three scientific databases yielded a selection of seven studies, providing a total of 26 experimental texts. For these texts, we determined the extent to which three prototypical narrative elements (derived from the narratological literature) were applied, namely 1) a sequence of non-randomly connected particularized events, that are 2) experienced by a specific character, of whom 3) readers gain insight into the inner world. Subsequently, we attempted to connect the outcomes of the text analyses to the results reported in the effect studies, aiming to discover patterns in the effectiveness of narrative elements or combinations thereof.

Although our database search has shown that many researchers are interested in effect differences between the expository and narrative genre, only few studies appeared to be relevant for our analyses. Out of the 137 hits that were assessed for their suitability, only six studies were included in our dataset. The main reason behind this was that in many studies, the expository and narrative genre did not discuss similar content and, therefore, lacked thematic overlap. For example, Best et al. (2008) compare an expository text about the needs of plants with a narrative text about a boy and his pet. Accordingly, in spite of the major interest in the differences between expository and narrative texts, research that systematically charts the effects of these differences appears to be limited.

We are aware of the fact that the amount of data at hand for this study was very limited. Nonetheless, our text analyses have yielded interesting findings: the notions "expository" and "narrative" are operationalized differently in the selected studies.

Even though most "narrative" texts contained all three prototypical narrative elements, half of the "expository" texts turned out to manifest one or more of these elements as well. Grouping the narrative and expository texts according to the number of narrative elements they contained, we found that the difference in number of elements between the two genres – the manipulation distance – was larger for some themes than for others. This means that a purely narrative text was not always compared to a purely expository text. Consequently, even within the selected effect studies, the operationalization of the expository and narrative genre was not always optimal.

Considering the limited size of our dataset and the existing differences in operationalizations of the expository and narrative genre within this dataset, we must conclude that it is not surprising that we could barely locate patterns in the results of the selected effect studies. Although we expected a large manipulation distance to lead to genre effects on text comprehension, recall, experienced text comprehension, and text appreciation, this was not precisely the case. For themes with a large manipulation distance, genre effects were only occasionally found, and in opposite directions. Conversely, for themes with a smaller manipulation distance, genre effects were found regularly – even for themes with a manipulation distance of zero. However, the direction of the effects also differed in these cases: the narrative text sometimes led to better scores than the expository text, at other times to worse, and on occasion to similar scores. In addition, no consistent patterns were found for particular combinations of narrative elements. That is, when genre effects pointed in the same direction, the combination of narrative elements differed. Conversely, when the same combination of elements was applied, the genre effects were not the same.

Although we cannot draw firm conclusions with respect to genre effects on text comprehension, recall, experienced text comprehension, and text appreciation based on the current dataset, it is remarkable that none of the selected studies reported genre effects for text appreciation. It seems that students do not have a strong preference for either a more or a less narrative educational text. The assumption that narrative elements make texts more interesting, fun, and pleasant to read, however, seems to be a reason for educational authors and publishers to add these elements to educational texts. Future research with a more consistent manipulation of the expository and narrative genre should reveal whether narrative elements do truly not influence text appreciation – which would then no longer be a valid reason for adding narrative elements to educational texts. To find out the aims of incorporating narrative elements in educational texts, this needs to be discussed with educational authors and publishers: what are their intuitions? What kinds of design principles do they formulate? Do they pursue different goals with narrative elements in educational texts than with purely expository texts? Land et al. (2002) have shown that interviews can be fruitful in discovering what educational publishers consider important textual elements, and how they adapt their design principles accordingly.

In conclusion, at present, we can state that based on the current research no conclusions can be drawn about the relative effectiveness of narrative versus expository educational texts. For future research, the model discussed in Section 2.2 offers guidelines for a more consistent manipulation of the expository and narrative genre. The model appears to be valuable in distinguishing between fully expository texts, fully narrative texts, and hybrids. Taking this model into consideration and bearing in mind thematic overlap in the design phase of future experimental research, researchers can take a step in the right direction to gain more insight into the effects of narrativity in the educational domain.

In addition to a more consistent approach to the manipulation of experimental texts, it is essential to more systematically consider the types of dependent variables that are to be included in new research, as well as the tasks to assess these variables, and the types of target groups that will participate. Regarding these aspects, the current dataset displayed much variation. In order to arrive at well-founded conclusions, we do not only need *more systematic research*, but we particularly also need *more research* in general into this intriguing matter.

Finally, our study shows that it is important that experimental texts are made accessible to other researchers. We sometimes had difficulty in obtaining the full experimental texts from the selected effect studies. As a result, for a number of texts, we only had a fragment of the text at our disposal. Even though these text fragments also provide insights into the types of manipulations that have been applied, they do not give the full picture. This may have influenced the results of our text analyses. The experimental texts were also often lacking in studies that were excluded for other reasons, highlighting the importance of making experimental texts accessible in future effect studies. Open access throws light on previously performed studies and allows for replication of these studies, thereby enhancing the possibility of gaining more insight into the effects of narrativity within the educational domain.

# Chapter 4

## Narrative elements in expository texts: A corpus study of educational textbooks

While the use of narrative elements in educational texts seems to be an adequate means to enhance students' engagement and comprehension, we know little about how and to what extent these elements are used in the present-day educational practice. In this quantitative corpus-based analysis, we chart how and when narrative elements are used in current Dutch educational texts (*N*=999). While educational texts have traditionally been considered prime exemplars of expository texts, we show that the distinction between the expository and narrative genre is not that strict in the educational domain: prototypical narrative elements – particularized events, experiencing characters, and landscapes of consciousness – occur in 45% of the corpus' texts. Their distribution varies between school subjects: while specific events, specific people, and their experiences are often at the heart of the to-be-learned information in history texts, narrativity is less present in the educational content of biology and geography texts. Instead publishers employ narrative-like strategies to make these texts more concrete and imaginable, such as the addition of fictitious characters and representative entities.

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## 1. Introduction

In our daily lives, we come across all kinds of genres: we skim through newspapers, laugh about our friends' jokes, write grocery lists, listen to the latest pop songs, send e-mails to our colleagues, consult recipes for dinner, and watch the newest tv-series. "Genre" denotes a classification system to distinguish between different types of spoken and written text. In the linguistic literature, many different genres have been categorized and described (e.g., Biber & Conrad, 2009; Martin & Rose, 2008). However, broad theoretical consensus about the definition of specific genres is often lacking (Chandler, 1997). This is partly caused by the many different approaches to the study of genre. For instance, while some researchers define genres primarily on the basis of conventions (e.g., themes or settings) and/or forms (e.g., structure and style), others also consider the situational and social context in which texts are formulated (for a discussion on different approaches, see Chandler, 1997; Lee, 2001). In addition, the definition of a certain genre may vary across domains, cultures, and historical periods of time (cf. Biber & Conrad, 2009). Finally, the boundaries between genres tend to be "fuzzy", as supergenres may be divided into subgenres in multiple ways (e.g., "tv-series" into "crimes" or "drama"), and two or more genres may be merged into hybrid forms (e.g., "romantic comedy") (cf. Chandler, 1997; Santini, 2006). Therefore, for any study into genres, it is essential to clearly spell out its focus.

The current study focuses on the expository and narrative genre in the domain of Dutch educational texts. Traditionally, educational texts have been seen as prime exemplars of the expository genre, because they often introduce and explain new, subject-specific terms and/or concepts, such as the process of erosion in the geography text in (1).

(1) Under the influence of plant roots and the weather, rocks crumble all year. This is called erosion. During the winter, the process of erosion often proceeds faster. The water in the cracks and crevices of the mountain freezes and as a result pieces of rock are released. They bounce down the slope and break into smaller pieces. In their fall they take other stones with them. And all those rocks roll into the valley.

(*Meander*, geography grade 5, p. 12)

However, not all Dutch educational texts prove to be fully expository (Chapter 2 – Sangers et al., 2020). For example, the text in (2) presents a narrative about a prehistoric man named Iugas. This text, which is placed at the beginning of a new chapter in a history textbook, is used as an introduction to to-be-learned information about the Stone Age and Iceman Ötzi, who lived in this time period. The fictional character Iugas shows many similarities to Ötzi.

(2) The mountain towers high above Iugas. Heavy clouds gather around the top. Just a little while and then the snow will fall. Too early, it is too early. He has to go further. Once he is over the mountain pass, he will be safe. A twinge of pain passes over his face. His chest hurts at the place where an arrowhead is stuck between his ribs. His shoulder hurts, also from an arrow. He was able to pull it out, but the wound still hurts. Iugas has nothing to take care of the wound. He gathers all his strength. Maybe he is still able to get over the mountain. As long as he keeps walking.

(*Speurtocht*, history grade 5, p. 8)

In addition, Dutch educational textbooks include hybrid texts, combining characteristics from both the expository and narrative genre. For instance, in the biology text in (3), to-be-learned information about the pollination of flowers is told by a forester, named Jan, who can be considered a narrative character.

(3) An entomophilous flower needs insects for its pollination. A windflower uses the wind. "Windflowers don't need to be noticeable to insects. That's why they look different", says forester Jan. "They have long stamens and large pistils. Those hang down from the flowers. As long as the wind can get to them, that's the most important thing."

(*Argus Clou Natuur en Techniek*, biology grade 5, p. 49)

Narrative elements such as characters seem to be included in educational texts as a strategy to make these texts more engaging and better comprehensible, considering that many Dutch students find their educational texts too boring to read and/or too difficult to understand (Dood et al., 2020; Gubbels et al., 2017, 2019; Inspectorate of Education, 2017, 2020, 2021; Chapter 2 – Sangers et al., 2020). While the use of narrative elements seems to be an adequate means to solve these readability issues (cf. Norris et al., 2005; Chapter 2 – Sangers et al., 2020), we know little about how and to what extent these elements are used in present-day educational texts, and whether their distribution depends, for instance, on the school subject. Therefore, in this quantitative corpus-based study, we aim at gaining insight into the use and distribution of narrative elements in educational texts, focusing on the current Dutch educational practice.

An added benefit of charting the use of narrative elements in current educational texts is that it will enable future empirical research to reflect actual practices. Previous empirical studies into narrative elements in educational texts have been found to show conflicting results: while some studies indicate that narrative elements contribute positively to the comprehensibility of the to-be-learned information (e.g., Eng, 2002; Romero et al., 2005), other studies report negative outcomes (e.g., Cervetti et al., 2009; van Silfhout, 2014). These conflicting results are partly explained by the way

in which narrativity has been operationalized in the experimental texts of these studies, as the number and kinds of narrative elements used in these studies vary considerably (cf. Chapter 3 – Sangers et al., 2019). This suggests that the narrative genre has not yet been clearly defined within the boundaries of the educational domain. By basing future empirical research on actual practices, incomparability of empirical results due to too much divergence in narrative manipulations could be prevented. Hence, the following question guided our research:

> How and when are narrative elements currently being used in Dutch educational texts?

Before we explain how the use of narrative elements may vary between educational texts for different school subjects (Section 3), we discuss how we define narrativity within the educational domain (Section 2).

## 2. Narrativity in the educational domain

Over time, many definitions of the concept of narrative have been formulated in the literature. Some definitions have charted the linguistics features found in narrative texts, such as the combination of past tense verbs, third person pronouns, and adverbials of time and place (cf. Biber & Conrad, 2009; Fleischman, 1990), while other definitions were greatly inspired by the work of Labov (1972) and Labov and Waletzky (1967), who define narrative texts as consisting of six elements: abstract, orientation, complicating action, result, evaluation, and coda. For instance, work in Systemic Functional Linguistics builds upon Labov and Waletzky's structural approach, using schematic structures to define recurrent local patterns within and variation between genres – which are argued to enact the social practices of a given culture (cf. Christie & Martin, 2000; Martin & Rose, 2008).

While previous studies have often focused on specific linguistic features of certain genres, our focus is on the text's content. A recurrent element in content-based narratological definitions is the representation of events, although scholars have disagreed about whether a single event suffices for a narrative (Abbott, 2008; Genette, 1982), whether at least two events, ordered in time, are needed (Labov, 1972; Prince, 2003; Rimmon-Kenan, 2002), or whether the events of a narrative should be connected in a non-random way, including relations of causality (Bal, 1997; Onega & Landa, 1996; Richardson, 1997; Sanford & Emmott, 2012). Another frequently mentioned narrative element is a need for the involvement of human or quasi-human entities in the events described (Fludernik, 2009; Herman, 2009; Norris et al., 2005; Ryan, 2007). Toolan (2001) has combined these elements into his definition of narrative, adding that readers should be able to "learn" something from the agonist's experiences:

> "A narrative is a perceived sequence of non-randomly connected events, typically involving, as the experiencing agonist, humans or quasi-humans, or other sentient beings, from whose experience we humans can 'learn'" (Toolan, 2001, p. 8).

In Chapter 2, we have shown that Toolan's (2001) definition is well-applicable in the domain of Dutch educational texts, and that a narrative educational text can be characterized as exhibiting the following three narrative elements: 1) a sequence of non-randomly connected particularized events, that are 2) experienced by a specific character, of whom 3) readers gain insight into the inner world (Sangers et al., 2020).

A more detailed definition of these elements is as follows. First, narrative educational texts represent two or more events that are connected in a logical way, for instance by means of causal or temporal relations. These events are particularized rather than generic: they take place only once, at one point in time and at one location, as opposed to recurrent phenomena (compare "Yesterday, Lisa went to the University Hall in Utrecht. After a short speech from her supervisor, she received her diploma for the bachelor Communication and Information Studies" versus "Many students graduate from university each year"). Particularization is strengthened by references to the specific time and place at which these events take place. Increasing the degree of detail for these aspects makes a text more concrete, and prompts sensory imagery of the text's content.

Second, narrative educational texts contain at least one individual who experiences the events described in the text, either by taking active part in these events or by passively experiencing them. This character can be human as well as human-like (e.g., an animal). Human or human-like groups are not considered specific characters (compare "Lisa went to the University Hall in Utrecht" versus "All undergraduates went to the University Hall in Utrecht").

The third narrative element involves the representation of an inner world, the so-called "landscape of consciousness", through the expression of thoughts, feelings and/or sensory perceptions (Bruner, 1986). This landscape of consciousness is complementary to the text's "landscape of action", which is the relationship between the actions of a character and their consequences. The landscape of consciousness is usually linked to a specific character ("Lisa was happy to receive her diploma"), but can also give insight into the inner world of a group ("All undergraduates were happy to receive their diplomas"). If a landscape of consciousness is not explicitly elaborated upon in a text, readers can infer this inner world themselves (cf. Chapter 2 – Sangers et al., 2020).

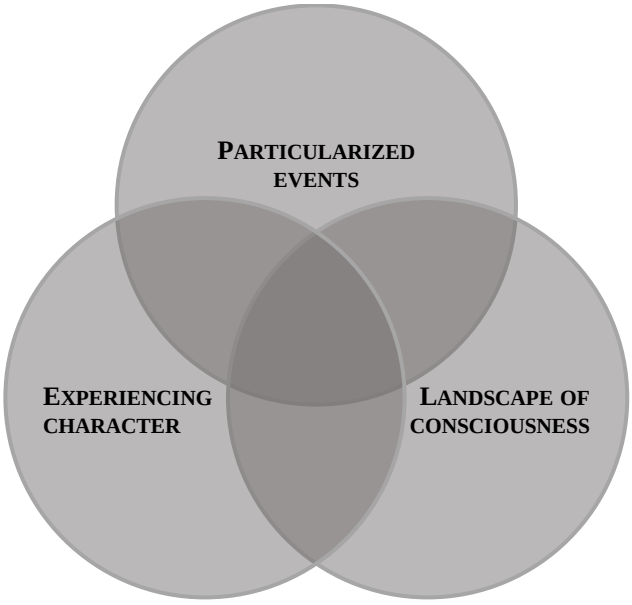
The three narrative elements are, for instance, combined in the history text about prehistoric Iugas in (2). This text contains several logically related particularized events (e.g., "He was able to pull it out", "He gathers all his strength"), that are experienced by a fictitious individual named Iugas, of whom readers gain insight into

his inner world by the expression of his thoughts (e.g., “Too early, it is too early”) and sensory perceptions (e.g., “A twinge of pain passes over his face”).

While many traditional definitions present a binary interpretation of narrative, Ryan (2007) proposes a scalar interpretation that focuses on the question “is text 1 more narrative than text 2?” rather than “is text 1 a narrative?” According to Ryan (2007, p. 28), narratives should be viewed as “a fuzzy set allowing variable degrees of membership, but centered on prototypical cases that everybody recognizes as stories”. Based on such a scalar interpretation, a text is most narrative if it contains all narrative elements that are considered prototypical in a certain domain. If a text contains some but not all prototypical narrative elements, this text is merely less pronounced narrative than the narrative prototype, showing pronounced signs of narrativity. This indicates that all texts categorized as “narrative” are related to a greater or lesser extent to the narrative prototype, without losing the “narrative” label. Taking such an interpretation within the educational domain allows for the inclusion of educational texts that combine expository and narrative features, such as the hybrid text in (3), in which forester Jan tells about the pollination of flowers.

In Chapter 2, we have qualitatively illustrated that hybrid forms of narrativity can be found in the educational domain, incorporating the three narrative elements mentioned earlier, which can be considered prototypical in the educational domain, in varying combinations (Sangers et al., 2020). This variation can be visualized in the form of a Venn diagram, in which each circle represents one of the three narrative elements (see Figure 1). The intersections represent the different combinations of narrative elements, such as that of particularized events and an experiencing character on the left-hand side of the diagram. As Figure 1 shows, the less-pronounced narrative texts evolve around prototypical “full” narratives such as (2), which are classified in the center of the diagram.

**Figure 1.**
Different combinations of prototypical narrative elements in the educational domain




While we have previously shown that most areas of Figure 1 can be identified in Dutch educational texts (see Chapter 2 – Sangers et al., 2020), the frequency with which the various combinations of prototypical narrative elements occur in Dutch educational materials is still unknown. Therefore, the model in Figure 1 guided our first sub-question:

RQ1 How frequently do the different combinations of prototypical narrative elements occur in Dutch educational texts?

In Section 3, we discuss why the frequency of the various combinations of narrative elements may vary across school subjects.

## 3. The role of narrative elements in different school subjects

In the literature, it has been argued that concrete and imaginable information has a processing advantage over abstract information, being easier to comprehend and more interesting to read (Nisbett & Ross, 1980; Sadoski & Paivio, 1994; Sadoski et al., 1991). An explanation for this "concreteness effect" is given by the Dual Coding Theory (DCT, Paivio, 1971, 1986; Sadoski & Paivio, 1994), which distinguishes between a verbal system – specialized in language processing – to represent information and a mental imagery system, which concerns the processing of world knowledge about events and objects. According to the DCT, abstract information is

stored only verbally, because it evokes less mental imagery, while concrete information is stored via both the verbal system and the mental imagery system. The activation of both cognitive systems elicits mental images that make concrete information more engaging, better comprehensible, and more easily retrievable from memory (Sadoski, 1999, 2001). Given the substantial empirical evidence supporting the claims about concreteness (for an overview, see Sadoski, 2001), making educational texts more concrete and imaginable seems an adequate strategy to enhance their comprehensibility and attractiveness.

One way of attaining more concreteness and imaginability seems to be the incorporation of narrative elements in educational texts: the more detailed information a text provides about specific events, specific characters, and the context, the more concrete and imagery-provoking this text is (Nisbett & Ross, 1980). The extent to which educational publishers make use of narrative elements in their texts, however, may be influenced by the nature of the to-be-learned information, which differs from school subject to school subject. That is, while specific events, specific people, and their experiences are often at the core of history texts, texts for biology and geography focus on recurrent natural phenomena and/or general processes, without human involvement or with humans being only passively involved (e.g., in explanations about processes in the human body). For instance, the history text in (4) introduces the well-known historical figure John F. Kennedy as a specific character who experiences the specific events that led to his unfortunate death in 1963. By contrast, the geography text in (5) discusses the origin of coal from the Carboniferous marshes, describing events that are generic rather than specific, and including no human agents.

(4) In the United States, a young, handsome president came to power in 1960: John F. Kennedy. He had big plans for his country. The world was shocked when Kennedy was murdered in 1963. He was shot dead while driving through the city of Dallas in his open top car. The images of the murder were shown on television.

(*Eigentijds*, history grade 5, p. 50)

(5) Coal originated from the Carboniferous marshes. This is how it happened. Dead plants started to rot. The remains of these plants formed a layer of peat. Water washed a layer of sand over it. On top of this layer, plants started to grow again. A new layer of peat was formed. During millions of years, those layers of peat were pressed together. A solid material, that we call coal, was formed. Coal can be used as fuel.

(*Grenzeloos*, geography grade 5, pp. 8-9)

While no narrative elements are included in (5), the narrative elements in (4) are at the heart of this text's educational content and, therefore, cannot be disregarded.

Presuming a stronger connection between narrativity and the educational content of history texts, we expect to find the three prototypical narrative elements, and combinations thereof, more frequently in these texts than in texts for biology and geography.

We should, however, acknowledge that the educational content of geography does not only cover natural phenomena, such as the origin of coal in (5), but also includes human-related topics, such as migration in (6). Hence, it seems likely that the educational content of texts about human geography (GH texts) more frequently involves people than that in texts about physical geography (GP texts), offering more options to include narrative elements. However, the extent to which narrative elements occur in GH texts may still differ from that of history texts, as the educational content in GH texts tends to be less specific than that in history texts, focusing on general tendencies rather than specific events, and on groups rather than specific characters. Therefore, GH texts may occupy an intermediate position between history texts on the one hand, and biology and GP texts on the other hand.

(6) Migration can also cross borders. In case of emigration, people move to another place of residence in another country. In case of immigration, someone arrives at a country to settle there. In recent years, for instance, many Polish people have come to the Netherlands. Initially they only came to the Netherlands to work, but nowadays many of them settle here with their family.

(*De wereld van*, geography grade 8, p. 29)

Following our line of reasoning that biology, GP, and GH texts are less often about specific events, specific characters, and specific contexts, we believe these texts will also tend to be more abstract and less imagery-provoking than their history counterparts. Therefore, these texts might significantly benefit from narrative-like strategies to make them more concrete and imaginable.

One such strategy could be the addition of a specific character to the text. In history texts, publishers can – and often have to – draw on real, well-known historical figures. The educational content of biology, GP, and GH texts, however, might often not contain such authentic characters. To add specific characters to texts for these school subjects, publishers would generally have to invent their own characters. For instance, in the biology text in (7), information about food chains is conveyed by two fictitious characters, Eva and the guide, thereby making the to-be-learned information more concrete and imaginable.

(7) Eva listens to the guide. He describes how wild animals are constantly trying to survive. “A herd of zebras is grazing, over there. They do nothing but graze. And of course they pay attention. But at the moment they have a rest, because: do you see those lions there? They just caught a young zebra. Now they are eating him.” “How sad for that little zebra,” Eva says. “That’s how you see it,” the guide says, “but without those zebras, the lions would die. Tell me: do you ever eat a sausage or a hamburger?” Eva nods. “Then you eat an animal, don’t you?” the guide says. “People eat meat as well. We keep cows and pigs to eat!”

(*Wijzer! N&T*, biology grade 5, p. 52)

In addition, publishers can apply a “pars pro toto” strategy to support generic educational content. In this case, in addition to or instead of giving a summary description of a certain concept, a prototypical instance of this concept is highlighted. For example, the text in (1), which gives a generic description about the process of erosion, is preceded by the paragraph in (8), in which a specific instance of erosion is described. This paragraph presents a series of chronologically related events that focus on individualized natural entities (*one* cleft, *one* seed, and *one* tree) instead of the entire group of entities. As such, the generic to-be-learned information in (1) is introduced in a more concrete and imaginable way. Similarly, in the biology text in (9), educational content about the maturation of babies is conveyed by focusing on the developmental process of *one baby*. The baby in (9), who cannot be linked one-on-one to a specific person in the real – or fictitious – world and, therefore, does not qualify as a character, is considered a “representative” of the entire group of babies. Although focusing on a representative entity (*a baby*) instead of giving a summary description of all entities (*all babies*) makes an educational text more concrete and imaginable, this strategy is more conceptual than the description of a real or fictitious character who can be considered a typical example of the group of entities. For instance, the author of (9) could also have chosen to highlight a specific baby as an example case (e.g., *baby Thomas*). Such an exemplar baby is more concrete than a representative baby, because it maps one-on-one to an individual in the real or fictitious world. Rather than representing the entire group of entities, an exemplar can be used for the categorization of new potential group members by way of comparison (cf. exemplar vs. prototype theory; Murphy, 2016). From less to more concrete/imaginable, the above three ways to frame educational content about babies are schematically related to each other as follows:

*all babies* (group) → *a/the baby* (representative) → *baby Thomas* (exemplar)

(8) It started with a small crack in the rock. Moisture started to grow in it and at some point some seeds. A tree grew from one of those seeds. The roots of that tree penetrated further and further into the crack. And so the crack became wider and deeper. Snow and ice made the crack a little wider every year, because water expands when it freezes. And then one day, this huge piece of rock broke loose and popped down...
(*Meander*, geography grade 5, p. 12)

(9) After seven weeks, a baby looks more like a tadpole than a human. But all kinds of things are coming into existence in that body. For instance, brains and a heart that pumps real blood. After twelve weeks, the baby has arms, legs, hands, and feet that move. This is how he exercises his muscles.
(*Binnenstebuiten*, biology grade 5, pp. 42-43)

Taken together, we expect 1) narrative elements to be more frequent in history texts than in texts for biology, GP, and GH, while hypothesizing that 2) strategies to make educational texts more concrete, such as the addition of fictitious characters and representative entities, are more frequent in the latter subjects. This motivated our second sub-question:

RQ2 To what extent are narrative elements applied differently in texts for biology, physical geography, human geography, and history?

In Section 4, we clarify the method of our quantitative corpus-based analysis. Subsequently, in Section 5, we describe the results of our analysis. Finally, in Section 6, we turn to our discussion and conclusion.

## 4. Method

In this section, we describe the material selection (4.1), method of analysis (4.2), inter-annotator agreement (4.3), and method of statistical analysis (4.4).

*4.1 Material selection*

To find out whether differences in the distribution of narrative elements over texts for biology, GP, GH, and history are generalizable over grade levels, our corpus-based analysis focused on texts for grade 5 (*Dutch* groep 7) and for grade 8 (pre-university track, *Dutch* vwo 2).[1] While grade 5 students have acquired the basic reading skills required for a deep understanding of texts, grade 8 students need to be able to read more challenging texts, particularly in pre-university education.

*4.1.1 Textbook selection*

We selected educational texts from textbooks published by five well-known Dutch educational publishers. For grade 5, one textbook was selected per subject per publisher, leading to a total of fifteen textbooks.[2] For grade 8, only three out of five publishers also distributed textbooks on a pre-university level. All three did so for geography and history, while only two of them also published a biology textbook, leading to a total of eight textbooks. See Appendix A for a list of all twenty-three textbooks.

*4.1.2 Chapter selection*

For history and biology, we selected one chapter per textbook. Per geography textbook, two chapters were selected: one for GP and one for GH. This resulted in a selection of thirty-one chapters. We strived for thematic overlap per subject, both within and between grade levels. This was done to counter potential narrative distribution biases caused by topic selection as much as possible. Thematic overlap was established on the basis of a comparison of keywords.

For biology, the reproduction of humans, animals, and plants was chosen as the overlapping theme. For one grade 5 textbook including no information on reproduction, we selected a chapter on eating habits of animals and plants.

For history, we selected chapters that discussed the time period of stadtholder William of Orange, who led the Dutch Revolt against Spain during the start of the Eighty Years' war (1568-1648). For one grade 5 textbook including only events after 1900, we selected a chapter on the Cold War.

For geography, chapters were matched within grade level only, since it turned out to be unfeasible to select thematically overlapping chapters between grade levels.

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[1] The Dutch system for secondary education is divided into three educational levels, ranging from theoretical to vocational training: pre-university education (Dutch *vwo*), senior general education (Dutch *havo*), and pre-vocational education (Dutch *vmbo*). Within pre-university education, we focused on texts for grade 8 (year 2 of Dutch secondary education), because eighth graders are able to read texts on a more advanced level than seventh graders, who have only mastered a basic reading level (Committee Meijerink, 2009), and because eighth graders are still taking classes in all school subjects under investigation.

[2] Per publisher, texts for GH and GP were selected from the same geography textbook.

For GP, the grade 5 chapters were matched by their discussion of different sorts of landscapes, and the grade 8 chapters based on their focus on characteristics of the earth. For GH, the grade 5 chapters concentrated on the European Union, while the grade 8 chapters focused on demographic notions such as "birth rate" and "immigration". Even though the distinction between GP and GH chapters was generally straightforward, one grade 5 textbook paid equal attention to both sub-domains in all of its chapters. For this textbook, we selected a chapter on the climates and landscapes of Eastern Europe (GP) and a chapter on Europe that included discussions on the European Union (GH).

*4.1.3 Text selection*

Within the chosen chapters, we selected texts that included educational content and/or background information. A text was taken to be a unit of at least three sentences that belonged to a marked text box, and/or was grouped under a subheading (blank lines did not mark the beginning of a new text). In those few cases in which these rules did not suffice, we looked at font characteristics in order to make a final decision. Table 1 shows the number of texts per school subject and grade level. In total, the corpus consisted of 999 texts.

**Table 1.**
Number of texts per school subject and grade level

| Subject | Grade 5 | Grade 8 | Total |
|---|---|---|---|
| Biology | 147 | 84 | 231 |
| GP | 125 | 106 | 231 |
| GH | 124 | 118 | 242 |
| History | 137 | 158 | 295 |
| Total | 533 | 466 | 999 |

*4.2 Method of analysis*

While previous analyses of the narrative genre have often focused on narrative structure and/or specific linguistic features (e.g., Biber & Conrad, 2009; Fleischman, 1990; Labov & Waletzky, 1967), our focus is on the text's content, namely the three prototypical narrative elements in the Venn diagram in Figure 1. For each text, excluding its heading, we manually coded whether these three elements were present or not. To expedite the coding process, we first analyzed whether a text contained **one particularized event**, describing a happening that took place only once, at one point in time and at one location. Subsequently, we scored whether texts with one particularized event contained a second particularized event that was chronologically related to the first, forming a **sequence of particularized events**. For instance, the history text in (4), repeated here as (10), begins with the particularized event stating

that John F. Kennedy became president of the United States. This event is followed by that of his murder in 1963.

(10) In the United States, a young, handsome president came to power in 1960: John F. Kennedy. He had big plans for his country. The world was shocked when Kennedy was murdered in 1963. He was shot dead while driving through the city of Dallas in his open top car. The images of the murder were shown on television.

(*Eigentijds*, history grade 5, p. 50)

In addition, a text contained an **experiencing character** if an individual was represented who was either taking active part in an event ("In the United States, a young, handsome president came to power in 1960: John F. Kennedy") or passively experiencing it ("He was shot dead"). This character could be human as well as human-like. Groups and "tota pro partibus" (wholes for a part, for example, "the world", indicating the world's citizens) were not considered specific characters. In line with our discussion of narrative-like strategies that publishers may employ to make texts more concrete and imaginable, we also scored whether 1) a specific character was **fictitious** (vs. real), and 2) a **representative entity** was present in texts without a specific character, either being an individualized natural object, as in (8), or a human and/or an animal, as in (9).

Finally, a text contained a **landscape of consciousness** if thoughts, emotions, opinions, and/or wishes were represented explicitly. For instance, the history text in (11) gives insight into emperor Charles V's doctrinal ambition ("wanted") and emotional state ("was afraid"). Representations of an inner world that were imaginable but remained implicit in the text were not taken into account. A landscape of consciousness did not have to be linked to a specific character, but could also be expressed by groups or tota pro partibus. For instance, in (12), the emotions and thoughts of the common people are represented. Similarly, an inner world did not have to be related to the leading character of the text; it was also scored for minor characters, as for William of Orange's cousin in (13). Evaluations given by the author of the educational text were not taken into account (cf. Chapter 5 – Sangers et al., submitted A).

(11) Charles V wanted all his people to have the same faith. He was afraid of fights about the right faith. The Catholic faith was the only thing that brought together all people in his great empire.

(*Memo Geschiedenis*, history grade 8, p. 14)

(12) After the last seconds of Thursday October 4th 1582 had passed, it was suddenly October 15th in most parts of Europe. This only happened because many European countries switched from the Julian calendar to the Gregorian calendar, yet it upset many people. Riots broke out in some places because people thought that ten days of their lives had been stolen. It was said that migratory birds would not fly south in time. And the holy days had been shifted. Would the Saints understand what was going on?
(*Geschiedenis Werkplaats*, history grade 5, p. 9)

(13) William was eleven years old. His father was count of Nassau in Germany. That was what William would also become when he grew up. William had a cousin who was the prince of a tiny area in France. This cousin died. His will stated that he wanted William to succeed him as Prince of Orange. And so young William suddenly inherited a very important title.
(*Argus Clou Geschiedenis*, history grade 5, p. 44)

*4.3 Inter-annotator agreement*

For considerations of reliability, 10 percent of the corpus (*N*=103) was coded by a second, independent annotator (cf. Neuendorf, 2002). This sample was randomly compiled for each school subject and grade level, making use of the ASELECT()-function in Excel. Before the second annotator coded the sample, she engaged in a training phase to make her familiar with the procedure and the elements under investigation. The inter-annotator agreement was substantial to almost perfect (.74<κ>1.00) (cf. Landis & Koch, 1977), as is shown in Table 2.

**Table 2.**
Inter-annotator agreement (Cohen's kappa and % agreement) per narrative element

| Narrative element | Cohen's kappa | % agreement |
|---|---|---|
| One particularized event | .81 | 92 |
| Sequence of particularized events | .93 | 97 |
| Experiencing character | .88 | 95 |
| Landscape of consciousness | .74 | 91 |
| Fictitious character | 1.00 | 100 |
| Representative entity | .86 | 93 |

The annotators discussed and resolved disagreements in their analyses to reach a final dataset. This was achieved without difficulty. The somewhat lower kappa-score for landscape of consciousness, for instance, was caused by the fact that not all thoughts, emotions, opinions, and wishes were easily recognizable. In (14), for example, the ambition of William of Orange to reach freedom of religion was overlooked by one annotator as the representation of a belief/wish.

(14) A number of southern regions, such as Limburg, Brabant, and Zeeland Flanders, now belonged to the Republic. Many Catholics lived in these regions. The ideal of William of Orange was for everyone to decide for themselves which religion they wanted to embrace. After the war, one could indeed decide on what to believe. In practice, however, it was much harder to be a Catholic than to be a Protestant. Nevertheless, no one could be punished or arrested for his faith. And that is still the case today.
(*Argus Clou Geschiedenis*, history grade 5, p. 59)

*4.4 Method of statistical analysis*

The final dataset was analyzed using R version 3.6.1 (R Core Team, 2019). The analyses were completed via generalized linear mixed models, using the packages haven (Wickham & Miller, 2019), lme4 (Bates et al., 2015), emmeans (Lenth, 2019), and ggplot2 (Wickham, 2016). We added the fixed factors Subject, Grade level, and their interaction to the models in a stepwise manner. Because some publishers did not design materials for all school subjects and/or grade levels under investigation, the statistical analyses did not allow for differentiation between publishers. To account for 1) potential differences in stylistic preferences between textbooks from different publishers and 2) correlations between texts for the two sub-domains of geography (which were selected from the same geography textbook, see also Section 4.1), Textbook was modeled as a random factor. Likelihood ratio tests were computed in order to assess which models fitted the data best. In Section 5.2, we present the significant results of the best fitting models. See Appendix B for an overview of all results.

## 5. Results

Our analyses focused on the distribution of three prototypical narrative elements – particularized events, experiencing characters, and landscapes of consciousness – over Dutch educational texts for different school subjects. We sketch a picture of the overall occurrence of the three narrative elements in our corpus (Section 5.1), before we discuss the statistical analyses with respect to their distribution over biology, GP, GH, and history texts (Section 5.2.1). Subsequently, we consider the distribution of fictitious characters and representative entities (Section 5.2.2), and discuss some qualitative observations regarding these strategies to make educational texts more concrete (Section 5.3).

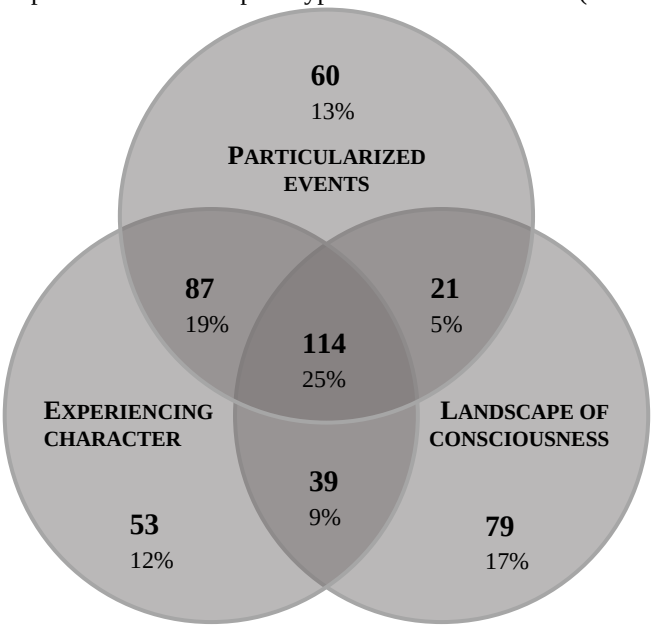
*5.1 Overall occurrence of prototypical narrative elements*

A sequence of particularized events was found in 138 texts of the corpus ($N$=999). However, due to singularity issues, the statistical model for this element could not be run without errors. Since we were able to run the model for texts that contain (at least) one particularized event (282 texts), and its raw frequency pattern resembles that of

the erroneous model, we report the results for texts with one particularized event here.[3] We return to the theoretical and practical implications of this decision in the discussion section (Section 6).

Besides 282 texts with a particularized event (28% of all texts in the corpus), 293 texts contain an experiencing character (29%) and 253 texts a landscape of consciousness (25%). In total, 453 texts of the corpus contain one up to three of these narrative elements (45%), as opposed to 546 texts that are fully expository (55%). Figure 2 represents the number of texts found for each combination of prototypical narrative elements, showing that full narratives are best represented (114; 11%), while texts that combine a particularized event and a landscape of consciousness without introducing a specific character are least frequent (21; 2%).

**Figure 2.**
Number of texts per combination of prototypical narrative elements (*N*=453)




*5.2 Statistical analyses*

In this section, we first describe the statistical analyses for prototypical narrative elements (Section 5.2.1). Subsequently, we discuss the statistical analyses for fictitious characters and representative entities (Section 5.2.2).

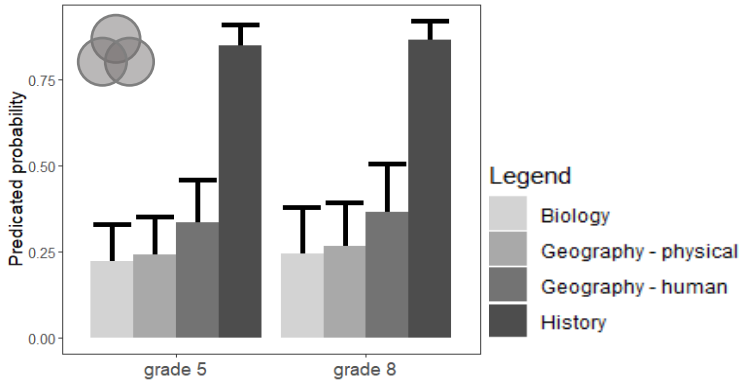
[3] Of the 138 texts with two or more related events, 103 were found for history, 12 for biology, 10 for GP, and 13 for GH. A similar pattern was found for the 282 texts with one particularized event: 176 for history, 31 for biology, 37 for GP, and 39 for GH.

*5.2.1 Prototypical narrative elements*

We first analyzed whether the distribution of educational texts with one up to three prototypical narrative elements over the corpus was influenced by the fixed factors Subject, Grade level, and/or their interaction. For this analysis, which included all 453 texts categorized in Figure 2, the best fitting model was the model in which only Subject was entered as a fixed factor ($\chi^2(3)=43.56$, $p<.001$). As hypothesized, a post hoc Tukey pairwise comparison test revealed that prototypical narrative elements are more frequent in history texts than in texts for biology, GP, and GH (all $p$'s$<.001$).[4] These results are visualized in Figure 3.

**Figure 3.**

Predicted probability for texts with 1-3 types of narrative elements




Subsequently, we analyzed whether this pattern persisted for each individual prototypical narrative element (that is, the three autonomous circles). For each element, the same pattern was found: the model in which only the fixed factor Subject was entered fitted the data best (particularized event: $\chi^2(3)=23.98$, $p<.001$; experiencing character: $\chi^2(3)=24.63$, $p<.001$; landscape of consciousness: $\chi^2(3)=35.52$, $p<.001$). Post hoc Tukey tests showed that all three prototypical narrative elements are more frequent in history texts than in biology, GP, and GH texts (all $p$'s$<.001$), as visualized in Figure 4-6.

[4] For the complete Tukey results, see Appendix B.

**Figure 4.**
Predicted probability for particularized event

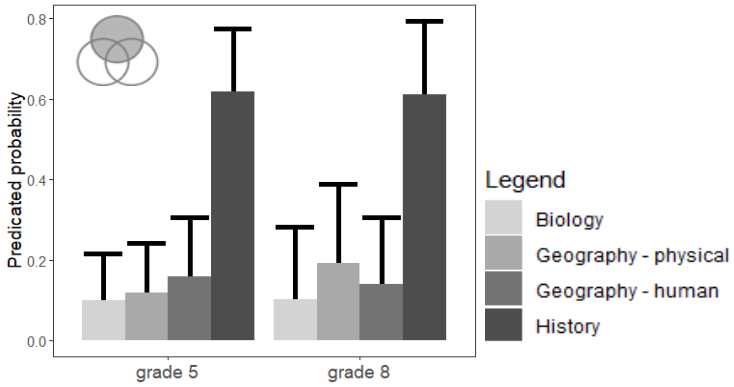



**Figure 5.**
Predicted probability for experiencing character

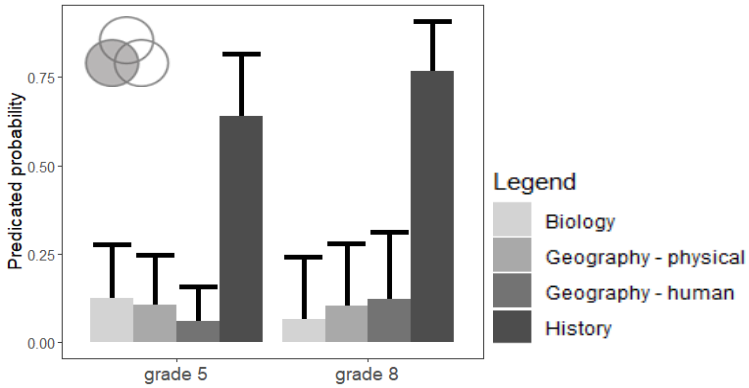
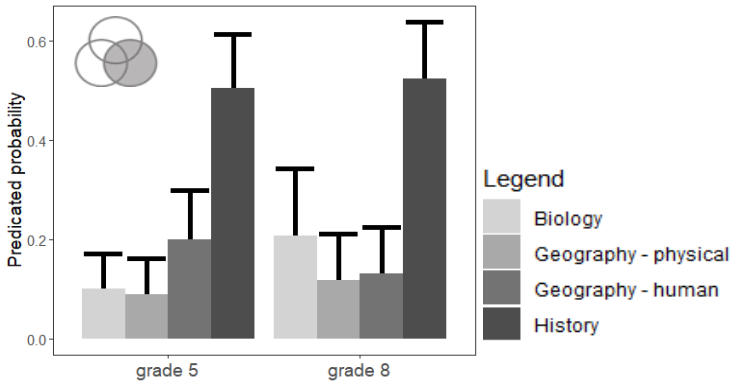
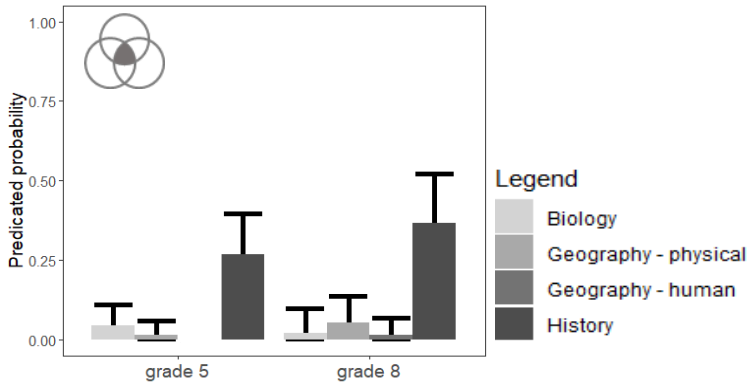



**Figure 6.**
Predicted probability for landscape of consciousness



Finally, we analyzed whether the pattern persisted in full narratives, combining the three narrative elements. Once again, the model in which Subject was entered as a fixed factor was the best fitting model ($\chi^2(3)=32.05$, $p<.001$). Following the pattern, a post hoc Tukey test showed that full narratives are more frequent in history texts than in texts for biology, GP, and GH (all $p$'s<.001), as visualized in Figure 7. None of the analyses revealed an effect for Grade level or an interaction effect of Grade level and Subject.

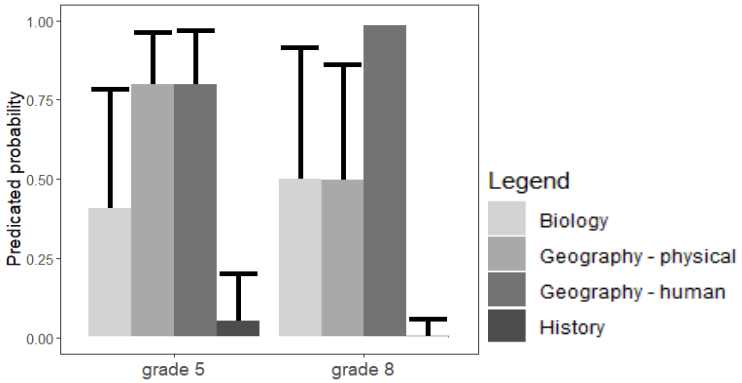
**Figure 7.**
Predicted probability for full narratives




*5.2.2 Fictitious characters and representative entities*

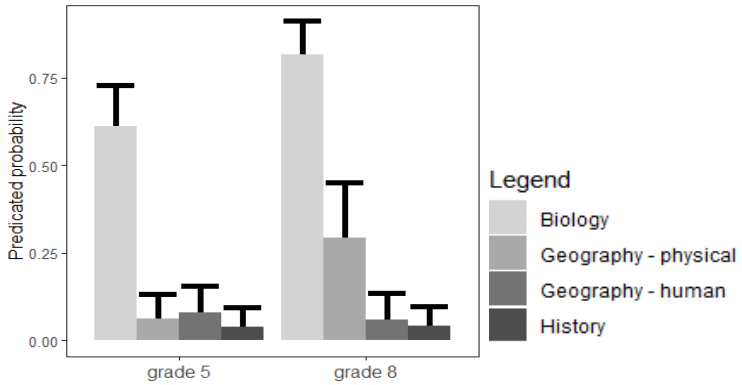
Of the 293 texts with an experiencing character, the majority include a character who exists or existed in the real world (228 texts, 78%), while only 65 texts introduce a fictitious character (22%). For texts with a fictitious character, the model in which only Subject was entered as a fixed factor was the best fitting model ($\chi^2(3)=20.38$, $p<.001$). As hypothesized, the pattern for fictitious characters was opposed to the one found for prototypical narrative elements: a post hoc Tukey test revealed that fictitious characters are less frequent in history texts than in texts for biology ($p=.008$), GP ($p<.001$), and GH ($p<.001$), as visualized in Figure 8. This indicates that if experiencing characters are absent in the educational content – as is often the case in biology, GP, and GH texts –, publishers occasionally add fictitious characters to the text, while they generally do not apply this strategy if specific characters are at the core of the to-be-learned information, as is the case in most history texts.

**Figure 8.**
Predicted probability for fictitious experiencing characters




In addition, for texts with a representative entity (225 texts, 23%), the model with the fixed factors Subject ($\chi^2(3)=51.52$, $p<.001$), Grade level ($\chi^2(1)=5.91$, $p=.015$), and their interaction ($\chi^2(3)=13.25$, $p=.004$) was the best fitting model. A post hoc Tukey test revealed that in both grade 5 and grade 8 texts, representative entities are more frequent in biology texts than in texts for GP, GH, and history (all $p<.001$). In addition, in texts for grade 8 – but not for grade 5 –, representative entities are more frequent in GP texts than in GH ($p<.001$) and history texts ($p=.002$). These results, which are visualized in Figure 9, indicate that while experiencing characters are not so much at the heart of the educational content in biology and GP texts, these texts are occasionally made more specific by the application of representative entities. Furthermore, the post hoc Tukey test showed that for GP texts – but not the other subjects – representative entities are less frequent in grade 5 than in grade 8 ($p=.017$).

**Figure 9.**
Predicted probability for representative entities



*5.3 Making educational texts more concrete: some qualitative observations*

Since we were also interested in the ways in which the strategies to make educational texts more concrete are qualitatively elaborated upon in educational texts for different school subjects, we made some additional observations. For instance, we observed that in biology, GP, and GH texts, fictitious characters are placed in a contemporary context, often representing a peer, such as Eva in (7) or the German teenager Matthias in (15), or an individual belonging to a certain professional group, such as gynecologist Loes in (16). By contrast, in history texts, fictitious characters are situated in a historical context, often representing the "common man" experiencing the events of his time, such as prehistoric man Iugas in (2) or merchant Pieter in (17). The three fictitious characters in (15)-(17) introduce themselves, mentioning their name, and share their personal stories, interlaced with to-be-learned information.

(15) Guten Tag! I am Matthias Sammer. I live in Berlin and I enjoy being your guide while you are exploring my country. Germany is a big country in Europe. The Netherlands fits into it almost nine times and we have five times as many inhabitants.

(*BuiteNLand*, geography grade 8, p. 17)

(16) Hello, my name is Loes. I work as a gynecologist and I am involved in pregnancies and deliveries that are not going well. In the Netherlands, many babies are born at home under the supervision of a midwife. However, giving birth at home can also involve too much risk.

(*Biologie voor jou*, biology grade 8, p. 183)

(17) I am Pieter Ysenbouts from Antwerp. I buy and sell spices from the East: nutmeg, pepper, cloves, cinnamon... The commercial ships bring me everything. Maybe I will travel on a such a ship myself soon.

(*Tijdzaken*, history grade 5, p. 77)

For educational content about natural phenomena, we observed a similar distinction along the lines of representative entities (*a baby*) versus exemplar characters (*baby Thomas*) to concretize generic to-be-learned information about human or human-like entities (*all babies*). Compare, for instance, the geography texts in (18) and (19), which originate from the same textbook. In (18), the general process of the formation/eruption of stratovolcanoes is explained by the description of a representative instance, focusing on individualized natural entities. However, this instance does not link one-on-one to an actual event in the real world. By contrast, (19) discusses a real exemplar of a stratovolcano eruption, namely that of the Soufrière on Montserrat. As opposed to (18), the time and place of the volcano eruption are explicated in (19). In addition, while (18) focuses on the technical aspects

of the volcano eruption, (19) rather concentrates on its consequences for the human population.

(18) At a convergent boundary, a heavy earth plate slides beneath a lighter earth plate. The heavy plate disappears deeper and deeper into the mantle, causing the stones to melt. The resulting magma wants to rise again. (…) Eventually the pressure becomes too high and the volcano erupts explosively. The tough lava quickly solidifies. This creates a volcano with steep slopes: a stratovolcano.

(*De wereld van*, geography grade 8, pp. 54-55)

(19) A dormant volcano can come back to life. This happened not so long ago with the Soufrière volcano on Montserrat, a British island located 150 kilometers from Saba, belonging to the same island arc. Like Mount Scenery, the Soufrière had been quiet for four hundred years. But on July 18th, 1995, the volcano erupted.

Because there had been earthquakes since 1992, the volcano was closely monitored. This allowed the population to be brought to safety in time for the eruption. About 7,000 residents were evacuated to surrounding islands and to the United Kingdom. The nineteen deaths on the island were people who had ignored the warnings. The capital of Montserrat was wiped off the map, only the north was still habitable and tourism did completely collapse.

(*De wereld van*, geography grade 8, pp. 49-50)

The two texts evoke a different learning approach: while (18) presents a hypothetical, individualized instance of generic to-be-learned information to which real exemplars could be linked via deduction, (19) provides a real exemplar to which more generic educational content can be associated via induction. As can be inferred from the texts' page numbers, the publishers of the GP textbook have chosen to place the exemplar situation before the representative instance, proceeding from specific to somewhat more generic educational content.

## 6. Discussion and conclusion

In this quantitative corpus-based study, we charted how and when prototypical narrative elements, namely particularized events, experiencing characters, and landscapes of consciousness, are being used in present-day Dutch educational texts. More specifically, we analyzed 1) the frequency with which various combinations of these narrative elements are used in Dutch educational texts, and 2) the extent to which they are applied differently in texts for the school subjects biology, physical geography, human geography, and history. Our findings are summarized in Table 3.

**Table 3.**
Summary of the quantitative findings

| | Narrative elements | Number of texts (*N*=999) | % of texts corpus | Significant patterns |
|---|---|---|---|---|
|  | One or more types of narrative elements | 453 | 45% | HI>BI=GP=GH |
|  | Particularized event (PE) | 282 | 28% | HI>BI=GP=GH |
|  | Experiencing character (EC) | 293 | 29% | HI>BI=GP=GH |
|  | Landscape of consciousness (LoC) | 253 | 25% | HI>BI=GP=GH |
|  | All three narrative elements | 114 | 11% | HI>BI=GP=GH |
|  | PE + EC | 87 | 9% | |
|  | PE + LoC | 21 | 2% | |
|  | EC + LoC | 39 | 4% | |
| | Fictitious characters | 65 | 7% | HI<BI=GP=GH |
| | Representative entities | 225 | 23% | 5: BI>GP=GH=HI<br>8: BI>GP>GH=HI<br>GP: 5<8 |

Our results demonstrate that even in a domain that has traditionally been considered the prime exemplar of the expository genre, narrative elements are found quite frequently: 45 percent of the educational texts in our corpus are categorized in one of the narrative areas of the model in Figure 1, indicating that only 55 percent of the texts in the corpus are fully expository. Of the three prototypical narrative elements, an experiencing character is most frequently found (*N*=293), closely followed by a particularized event (*N*=282) and a landscape of consciousness (*N*=253). When two narrative elements are combined, the combination of a particularized event and an experiencing character is most common (*N*=87).

In addition, our statistical results show that the occurrence of narrative elements in educational texts depends on the nature of the to-be-learned information. As we

hypothesized, particularized events, experiencing characters, and landscapes of consciousness are more frequent in history texts than in biology, GP, and GH texts. This substantiates our reasoning that the educational content of the school subjects under investigation differs in its focus on narrativity – with specific events, specific people, and their experiences often being at the heart of history texts, and a focus on general tendencies in biology, GP, and GH texts. This indicates that narrative elements are less frequently applied in contexts in which they fit less naturally. In fact, when prototypical narrative elements are used in biology, GP, and GH texts, they are generally deliberate interventions.

Following our observation that biology, GP, and GH texts are less often about specific events, specific characters, and specific contexts, we argued that these texts would also tend to be more abstract and less imagery-provoking than history texts. Given the theoretical and empirical evidence underlining the processing advantage of concrete information over abstract information (cf. Sadoski, 2001), we reasoned that biology, GP, and GH texts would benefit from strategies to make educational texts more concrete, such as the addition of fictitious characters and representative entities. Indeed, the distribution pattern of texts with a fictitious character is opposite to that of texts with prototypical narrative elements: fictitious characters are less frequently added to history texts than to texts for the other school subjects. This shows that while specific characters tend to be real historical people in history texts, those is biology, GP, and GH texts are almost always fictitious inventions. It is, however, important to acknowledge that the deliberate intervention of fictitious characters was not so frequent in itself, being employed in only 7 percent of the texts in the corpus (4% of biology texts, 9% of GP texts, 11% of GH texts, 3% of history texts), compared to the occurrence of real experiencing characters in 23 percent of the texts in the corpus (10% of biology texts, 4% of GP texts, 1% of GH texts, 66% of history texts). The other strategy – the incorporation of representative entities – was applied more frequently, namely in 23 percent of the texts in the corpus (67% of biology texts, 17% of GP texts, 7% of GH texts, 4% of history texts). In line with our hypotheses, the distribution pattern of representative entities differs from that for texts with prototypical narrative elements: while the latter elements are not so much at the heart of the educational content in biology and GP texts, publishers make use of representative entities to make these texts more concrete and imaginable. Interestingly, representative entities were not found more frequently in grade 5 GP texts and in GH texts than in history texts.

While we generally found robust effects for the distribution of narrative elements over school subjects, our distinction between two sub-domains of geography does not seem to be relevant with respect to the distribution of narrative elements. That is, contrary to our line of reasoning, our results indicate that GH texts (human-related, generic) do not occupy an intermediate position between history texts (human-related, specific) and biology and GP texts (non-human-related,

generic): they rather side with the latter two subjects. This means that even though GH texts discuss human-related topics – thereby offering more options for the inclusion of narrative elements –, their content remains as generic as that of texts for less human-related subjects. In addition, we did not find differences in the distribution of narrative elements over different grade levels, indicating that our results are generalizable over grade levels. Only one effect of grade level was found, which concerned just one school subject.[5]

The present research has provided insight into the distribution of narrative elements over Dutch educational texts for different school subjects. However, there are some limitations to this study that give rise to theoretical implications as well as new directions for future research. A first limitation to this study is that we were unable to run the statistical model for *a sequence of particularized events*, which is why we decided to report the results on the model for *one particularized event* instead. There is some theoretical basis for this decision. In the narratological literature, there has been a debate on the minimal criteria required for texts to be categorized as "narrative", particularly the criterium whether a single event suffices for a narrative (Abbott, 2008; Genette, 1982), or whether at least two events are needed (Bal, 1997; Labov, 1972; Onega & Landa, 1996; Prince, 2003; Richardson, 1997; Rimmon-Kenan, 2002; Sanford & Emmott, 2012). In our application of narrativity to the educational domain, we adopted the second definition: a narrative educational text is formed by a sequence of two or more non-randomly related events. This strict interpretation excludes educational texts with only one particularized event from a classification as narrative texts. However, following Ryan's (2007) scalar interpretation of "narrative", and introducing a model that allows for hybrid forms of narrativity – containing only one or two prototypical narrative elements –, we could also imagine a scalar interpretation *within* each prototypical narrative element. Following such an interpretation, educational texts with one particularized event would merely be less-pronounced narrative than educational texts that contain a sequence of particularized events – presenting more of a narrative scene to concretize the educational content rather than a complete story. Such a lenient interpretation would allow for nuances within each prototypical narrative element, giving rise to fruitful directions for follow-up research.

In addition, educational publishers might use particularized events not with the purpose of making educational texts more narrative but with the sole aim of making it more concrete and imaginable. This raises the question as to how narrativity and concreteness relate to each other: does a higher degree of narrativity always lead to more concreteness, and vice versa? Following the literature, the answer to the first part of this question seems to be positive: Nisbett and Ross (1980) have argued that the more detailed information a text provides about specific events, specific

[5] Exemplars were less frequent in grade 5 GP texts than in grade 8 GP texts.

characters, and the context, the more concrete and imagery-provoking this text is. This suggests that irrespective of a strict or lenient interpretation of the narrativity of events, adding a particularized event to an educational text enhances its concreteness and imaginability. However, it is not clear whether a higher degree of concreteness also brings about more narrativity. On the basis of the strict interpretation, the use of one particularized event instead of a sequence of particularized events would not make an educational text more narrative – the event, however, does make the text more concrete. This suggests that the relationship between narrativity and concreteness might not be one-to-one. If publishers are primarily concerned with making their texts more concrete, it would not be surprising if they added just one particularized event to the educational text. The lenient interpretation, on the other hand, does not preclude a one-to-one relation between the two concepts: the addition of one particularized event would make the educational text more concrete and somewhat – but not fully – narrative. Determining the precise relationship between narrativity and concreteness would be valuable for further theoretical development.

In this respect, it would be worthwhile to discuss our findings with publishers and authors of educational materials. What goals do they pursue with the application of narrative elements in their texts, and how do they see the relation with concreteness? Do publishers distinguish between narrativity and concreteness, or do they consider these concepts as intertwined? What kinds of design principles do they formulate to make their texts more narrative and/or more concrete? Earlier research has shown that interviews can be fruitful in discovering what educational professionals consider important textual elements, and how they adapt their design principles accordingly (Land et al., 2002).

A second limitation to this study is that we only analyzed two narrative-like strategies publishers can employ to increase the concreteness and imaginability of educational texts that are less inherently focused on specific events, characters, and contexts. Of course, other strategies may also be fruitful in conveying relevant content in a comprehensible and interesting way. One strategy, for instance, could be the use of "voice" in educational texts (cf. Beck et al., 1995; Chapter 5 – Sangers et al., submitted A), establishing an interaction between the author of the educational text and students to bridge the gap between students and the educational content they need to learn.

Third, in our study, we focused on a specific domain, namely Dutch educational texts. To be able to interpret our quantitative results in a broader context, it would be worthwhile to compare the use of narrative elements in Dutch educational texts to that of texts in other domains. A fruitful domain for comparison could, for instance, be journalism, as news texts also tend to convey new information, while often discussing particularized events and introducing "characters" (e.g., eyewitnesses), who may express their feelings and/or thoughts about the happenings described (cf. van Krieken & Sanders, 2017). Furthermore, it would be valuable to broaden the focus of the

current research by including texts from other cultures. While most – if not all – cultures define "narrative" as a genre, its exact interpretation within the educational domain (as well as any other domain) may differ from culture to culture (cf. Biber & Conrad, 2009). Therefore, in order to uncover any cultural differences with respect to narrativity in educational texts, it would be fruitful to compare our results on narrative elements in Dutch educational texts to that of educational texts from other countries.

Fourth, within the domain of Dutch education, we focused on educational texts for a limited set of school subjects, namely biology, geography, and history. In future research, it would be interesting to expand the current research by examining the distribution of narrative elements over additional school subjects. For instance, how and to what extent are narrative elements applied in school subjects that focus on formulas instead of human- or nature-related topics, such as mathematics?

Finally, future research could focus on the presumed rationale behind including narrative elements in educational texts: are narrative educational texts indeed more interesting to read and easier to understand than expository educational texts? Previous experimental research has shown conflicting results in this respect (see also Section 1). However, since these studies have used different operationalizations of the notions "expository" and "narrative", no firm conclusions can yet be drawn about the relative effectiveness of narrative versus expository educational texts (Chapter 3 – Sangers et al., 2019). Therefore, future research should pursue a more consistent approach to the manipulation of these genres in experimental texts. We believe that our model in Figure 1 offers valuable guidelines to make a fair distinction between fully expository educational texts, fully narrative educational texts, and hybrid educational texts, combining characteristics of both genres.

Taken together, we have demonstrated that narrative elements are quite common in educational texts – a domain that has traditionally been considered as the prime exemplar of the expository genre. In addition, we have shown that the occurrence of narrative elements in educational texts depends on the nature of the educational content: 1) prototypical narrative elements tend to be at the core of the to-be-learned information in history texts, while 2) strategies to make educational texts more concrete, such as the addition of fictitious characters and representative entities, are more frequently applied in school subjects in which prototypical narrative elements fit less naturally, namely biology and geography texts. This way, the current chapter has given insight into the use and distribution of narrative elements in educational texts, and has provided an essential step to investigate the potential of narrative elements in educational texts further – with the ultimate aim of designing optimal texts that present relevant educational content in a comprehensible and attractive way.

# Chapter 5
## Addressing the student: Voice elements in educational texts

Voice elements are those elements of educational texts that authors use to interact with students, such as questions, evaluations, or direct address forms ("you"). These elements are intended to enhance students' engagement and comprehension, but we know little about the extent to which they are used in present-day educational texts. Using a corpus of Dutch biology, geography, and history texts for grade 5 and grade 8 ($N$=1055), this study shows that voice elements are barely differentiated over grade levels. Conversely, voice elements are generally diversified over school subjects, as they are less frequent in history texts – which convey readily imaginable and relatable content – compared to biology and geography texts – which discuss less relatable content for which students need to exert more effort to connect it to their own world. This finding suggests that authors of educational texts have intuitions about the conditions under which voice elements are a desirable attribute.

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Sangers, N. L., Evers-Vermeul, J., & Hoeken, H. (submitted A). *Addressing the student: Voice elements in educational texts*.

## 1. Introduction

Despite rapid technological developments, textbooks are still the predominant instructional medium in present-day Dutch classrooms (Woldhuis et al., 2018). Since most learning is accomplished through reading of educational texts, students' success in school is highly dependent on their understanding of these texts. However, many Dutch students consider their educational texts too boring to read and/or too difficult to understand (Dood et al., 2020; Gubbels et al., 2017, 2019; Inspectorate of Education, 2017, 2020, 2021). Making educational texts more engaging has been argued to be an adequate means to solve these readability issues: students who are engaged in the active processing of educational texts are likely to be more attentive to the to-be-learned information represented in these texts, which stimulates deeper understanding and better learning of this information (cf. Beck et al., 1995; Brozo et al., 2007; Guthrie & Wigfield, 2000; Hidi, 2001; Sadoski, 2001; Schraw & Lehman, 2001).

Beck et al. (1995) were the first to introduce "voice" as a strategy to make educational texts more engaging. They developed a notion of voice that consists of three themes: activity, orality, and connectivity.[1] Activity involves making an educational text more dynamic by using verbs that represent concrete action, and by describing the immediacy of events and characters' responses to these events. Orality covers the use of conversational language, including colloquial expressions, emphatics, and explicit dialogue. Connectivity involves the emphasizing of relationships, such as addressing the reader directly, drawing connections between events and characters' responses, and vitalizing interrelationships among characters within the text.

Based on these themes, Beck et al. (1995) created voiced and non-voiced versions of a history text, for which a coherent and a non-coherent version were already developed in previous empirical research (cf. Beck et al., 1991; McKeown et al., 1992).[2] In an effect study among fourth graders, Beck et al. (1995) established that students achieved better comprehension for the text version that contained both voice and was coherent than for versions of this text that lacked either one or both of these aspects. These findings led Beck et al. (1995) to tentatively conclude that voice enhances students' comprehension of educational texts in coherent contexts.

Although we acknowledge the promise of including voice in educational texts to make these texts more engaging, and by that, better comprehensible, we believe that Beck et al.'s (1995) notion of voice is too wide-ranging, and hence, is in need of specification. We propose to define voice solely in terms of textual elements that

[1] As Beck et al. (1995) explain, these themes are not entirely separable.

[2] The operations used for the coherent versions were clarifying, elaborating, explaining, providing motivation for important information, and making connections explicit (Beck et al., 1995).

directly relate to the author of an educational text. While the activity of writing educational texts is in itself monologic, its communicative structure is dialogic, being the product of a reciprocal relationship between the author and students (cf. Nystrand, 1986; Vološinov, 1973).[3] The author can make this relationship explicit by using specific textual elements to openly interact with students. For instance, by asking students a question, the author of the history text in (1) helps students to relate the educational content to their personal lives, thereby decreasing the distance between them and this content (cf. Chapter 2 – Sangers et al., 2020).

(1) Do you prefer your clothes to look nice over them being comfortable? People used to consider their clothes mainly important for protecting their bodies against the weather or against scratches of branches. This means that clothes had to be robust and warm.

(*Wijzer! Geschiedenis*, history grade 5, p. 16)

Author-initiated dialogical elements, such as questions, form an important subset of Beck et al.'s (1995) catch-all interpretation of the concepts of connectivity and orality. For connectivity, however, in describing the relationship between text and reader, Beck et al. (1995) do not distinguish between author-initiated elements, which generate a layer on top of the text's content (cf. Smolkin et al., 2008), and elements that more directly relate to this content, such as characters' responses to events and their interrelationships. Similarly, for orality, Beck et al. (1995) do not make a distinction between the conversational language expressed by the text's author to initiate an interaction with students, and conversations that are text internal, among characters. These latter kinds of elements do not directly relate to the educational text's author, but rather have to do with narrativity (cf. Toolan, 2001, Chapter 2 and 4 – Sangers et al., 2020, 2021). We believe that author-initiated dialogical elements and narrative elements are two separate strategies to enhance students' engagement and text comprehension, and hence, should be defined and explored independently (cf. Chapter 2 – Sangers et al., 2020).

In this study, we focus on the dialogical elements of educational texts that are initiated by these texts' author, which we define as "the voice". While the inclusion of voice elements in educational texts seems to be an attractive strategy to enhance students' engagement and comprehension, we know little about the extent to which these elements are used in present-day educational texts. To gain more insight into the distribution of voice elements in educational texts, we conducted a quantitative

[3] For instance, "each point at which the skilled writer chooses one example rather than another, one term rather than another, certain comparisons rather than others, etc., is ultimately arbitrated not only by what the writer has to say but also by the needs of his or her readers to understand." (Nystrand, 1986, p. 36).

corpus-based analysis, focusing on the current Dutch educational practice. Our analysis was guided by the following research question:

How and when are voice elements currently being used in Dutch educational texts?

Before we turn to the method of our corpus-based analysis (Section 5), we describe the different ways in which voice elements can be expressed in Dutch educational texts (Section 2), and formulate hypotheses that concern potential diversification in educational publishers' distribution of these elements over school subjects (Section 3) and/or grade levels (Section 4).

## 2. The role of voice elements in Dutch educational texts

Voice elements surface in various ways in Dutch educational texts (cf. Chapter 2 – Sangers et al., 2020). Besides asking questions, as in (1), the author of an educational text can use imperatives to encourage students to do something, as in (2), or instruct them to imagine a situation sketched in the text, as in (3).

(2) Put on a helmet and also try to find a pair of goggles. Hang upside down to the climbing frame for a minute. Occasionally straighten up your upper body.

(*Argus Clou Geschiedenis*, history grade 5, p. 56)

(3) Standing under a powerful jet of water in the shower in the morning is wonderful! But imagine what happens if there were sand in the water: your skin would be sandblasted, and that is less pleasant. Let this exactly be what rivers do to rocks...

(*BuiteNLand*, geography grade 8, p. 34)

In addition, the author can highlight important or interesting educational content by adding an exclamation mark at the end of the sentence, as in (4). Such exclamations are intended to direct students' attention to specific parts of the educational text, and to make them consider why this particular information stands out.

(4) Some seed plants can reproduce without seed! How do they do that? By growing a new plant from a stem, a root, a tuber, or a bulb.

(*Argus Clou Natuur en Techniek*, biology grade 5, p. 51)

Another way in which the author can highlight educational content is by giving evaluations. Evaluations give students insight into the author's attitudes, feelings, values of judgement, or expectations about the text's content (cf. Conrad & Biber, 2000), and implicitly invite them to assess whether they agree with what is being said.

For instance, the evaluation in (5) states that the author considers the European Union very special. It is left to students to decide whether they agree with this evaluation or not.

(5) You belong to it: the European Union. As many as 28 different countries follow the same rules and laws. They collaborate at an economic and political level. Some countries are rich, others less so. People speak different languages, have different customs and yet things usually go well. Very special, this European Union!

(*Grenzeloos*, geography grade 5, p. 34)

Questions, imperatives, exclamations, and evaluations expressed by the author of an educational text can be defined as speech acts, as they invite or urge students to actively deal with or think about the educational content (cf. Austin, 1975; Houtkoop & Koole, 2000; Pander Maat, 2002; Searle, 1969, 1975). Besides speech acts, the author can use first- and second-person pronouns to start or continue a conversation with students. The author can use the second-person singular pronouns "you" and/or "your(self)" to directly address students as individuals, and/or the first-person plural pronouns "we" and/or "our(self)" to address students as a group to which the author belongs as well, as in (6). The use of such pronouns instantly makes an educational text more personal, bringing its educational content in closer proximity to students.

(6) From space you have to look carefully to see the small Netherlands. But if you know where the North Sea is located, you can find it quickly. The North Sea determines our climate. We have a moderate maritime climate here.

(*Argus Clou Aardrijkskunde*, geography grade 5, p. 21)

## 3. The role of voice elements for different school subjects

It is plausible that educational publishers choose to differentiate their use of voice elements over school subjects. As voice elements are supposed to decrease the distance between students and the educational content, they seem to be most beneficial for school subjects whose educational content is abstract and less personally relatable, such as biology and geography. In human-oriented school subjects, such as history, people regularly feature in the educational content, alongside their goals, experiences, and actions (Chapter 4 – Sangers et al., 2021). These individuals enable identification, and their presence can help students to view the educational content from different perspectives, making the to-be-learned information imaginable and relatable (cf. Bartelds et al., 2020; Hidi, 2001; Kuijpers, 2014). In this respect, historical figures act as go-betweens: they help to decrease the distance between the educational content and students. If such mediators are absent, as is the case in texts for less

human-oriented school subjects, students need to exert more effort to connect the to-be-learned information to their own world (cf. Chapter 4 – Sangers et al., 2021). In these cases, the author can extend a helping hand by acting as an alternative mediator in bridging the distance between the educational content and students (cf. Nolen, 1995). Hence, we hypothesize that publishers use voice elements more frequently in biology and geography texts than in history texts.

At this point, however, it is important to take into account that the school subject geography not only includes topics that are not human-oriented. Besides texts that focus on physical geography topics, such as (7), geography textbooks include content that more closely relates to humans, such as (8).

(7) Because the earth's axis is tilted, the sun in the Northern Hemisphere rises high above the horizon in the summer. In the far north, it does not even set at night. From May 20 to July 22, it is light here all day and night. We call this the midnight sun. In the winter, the sun does not rise at all in this area. This is called the polar night.

(*Argus Clou Aardrijkskunde*, geography grade 5, p. 19)

(8) Like the Netherlands, the European Union has its own government: the European Commission (EC). The European Commission is based in Brussels. The EC consists of 27 commissioners, a kind of ministers. They are appointed by the government of their own country. Each member state provides one commissioner, irrespective of how big or small the country is.

(*Argus Clou Aardrijkskunde*, geography grade 5, p. 88)

Following the line of reasoning above, we hypothesize that publishers use voice elements more frequently in physical geography texts than in human geography texts, because the educational content these texts aim to convey is more abstract and less personally relatable. In addition, we hypothesize that voice elements are more frequently used in human geography texts than in history texts, because these texts tend to focus on general tendencies rather than specific events, and on groups rather than individuals. As such, we expect human geography texts to occupy an intermediate position between biology and physical geography texts on the one hand, and history texts on the other hand. Taken together, we hypothesize that the distribution of voice elements in Dutch educational texts depends on school subject in the following way:

Hypothesis 1: history < human geography < physical geography = biology

## 4. The role of voice elements for different grade levels

It is also plausible that educational publishers use voice elements differently depending on grade levels. On the one hand, it has been commonly agreed upon that educational texts should become more complex as students' reading proficiency develops (Snow, 2002). Ideally, this reflects a progression in the course of a school career from relatively simple to more sophisticated and challenging texts (Brabham & Villaume, 2002; Shanahan et al., 2012), enabling students to progressively improve their functional literacy, and teaching them how to read texts that gradually become more abstract and less related to their personal experiences (Schleppegrell, 2004). This involves a development from texts with a personal writing style to texts that exhibit a more distant way of writing (Committee Meijerink, 2009; Evers-Vermeul & Holtermann, 2013). Since voice elements facilitate a direct, "here and now" interaction between the author of the educational text and students, they contribute to a personal way of writing, and can therefore be used to differentiate between simple and more complex educational texts. Hence, publishers may gradually decrease their use of voice elements in educational texts, with more of these elements present in texts for primary education than in those for secondary education. Taking potential differences between school subjects into account, we expect this decrease to mainly occur in texts for the less relatable school subjects biology and physical geography. That is, it is plausible that a decrease in voice elements is less prominent or even absent in the human-related school subjects history and human geography, since the number of voice elements in these subjects might already be limited, leading to potential floor effects.

On the other hand, the educational content in texts for secondary education tends to be more complex than that in primary education texts (Committee Meijerink, 2009; Hidi, 2000). Accordingly, in secondary education texts, voice elements might be helpful in bridging the increasing gap between the to-be-learned information and students (cf. Chapter 2 – Sangers et al., 2020). Hence, publishers may use voice elements more frequently in texts for secondary education compared to those for primary education. Again considering the potential differences between school subjects, we expect this increase to be more visible in texts for history and human geography than in those for biology and psychical geography, since in the latter subjects, the number of voice elements might reach ceiling effects.

In order to shed light upon this discrepancy in the predicted use of voice elements for different grade levels, our corpus-based analysis focused on texts for grade 5 (Dutch *groep 7*) and for grade 8 (pre-university track, Dutch *vwo 2*). While grade 5 students (age 10-11) have acquired the basic reading skills required for a deep understanding of texts, grade 8 students (age 13-14) need to be able to read more challenging texts, particularly in pre-university education (Committee Meijerink,

2009).[4] Taken together, we formulate two contrasting hypotheses for the influence of grade level on the distribution of voice elements in Dutch educational texts:

> Hypothesis 2A: progression simple-challenging: grade 5 > grade 8
> Hypothesis 2B: bridging student-content gap: grade 5 < grade 8

In the next section, we clarify the method of our corpus-based analysis (Section 5). Subsequently, we describe the results of our analysis (Section 6). Finally, we turn to our discussion and conclusion (Section 7).

## 5. Method

In this section, we describe the material selection (Section 5.1), method of analysis (Section 5.2), inter-annotator agreement (Section 5.3), and method of statistical analysis (Section 5.4).

### *5.1 Material selection*

#### *5.1.1 Textbook selection*

We selected educational texts from textbooks published by five well-known Dutch educational publishers. For grade 5, one textbook was selected per subject per publisher. Since physical and human geography topics are combined in Dutch geography textbooks, a total of fifteen grade 5 textbooks were selected. For grade 8, only three out of five publishers also distributed textbooks at a pre-university level. All three did so for geography and history, while only two published a biology textbook, leading to a selection of eight grade 8 textbooks. See Appendix A for an overview of all twenty-three textbooks.

#### *5.1.2 Chapter selection*

For history and biology, we selected one chapter per textbook. Per geography textbook, two chapters were selected: one for human geography and one for physical geography. This resulted in the selection of thirty-one chapters. We strived for thematic overlap per subject, both within and between grade levels, in order to counter potential distribution biases caused by topic selection as much as possible. Thematic

[4] The Dutch system for secondary education is divided into three educational levels, ranging from theoretical to vocational training: pre-university education (Dutch *vwo*), senior general education (Dutch *havo*), and pre-vocational education (Dutch *vmbo*). We focused on pre-university education, because this is the most advanced Dutch secondary education level, presenting students with the most challenging texts. Within pre-university education, we concentrated on texts for grade 8 (year 2 of Dutch secondary education), because eighth graders are able to read texts on a more advanced level than seventh graders, who have only mastered a basic reading level (Committee Meijerink, 2009), and because eighth graders are still taking classes in all school subjects under investigation.

overlap was established by comparison of keywords. See Chapter 4 (Section 4.1.2) for a more elaborate justification of the selected themes.

*5.1.3 Texts*

From the aforementioned chapters, we selected texts that included educational content and/or background information. Texts that originated from sources other than the educational textbook itself, such as newspaper articles or non-fictitious testimonials from historical figures, were excluded from the corpus. A text was taken to be a unit of at least three sentences that 1) belonged to a marked text box, and/or 2) was grouped under a subheading (blank lines did not mark the beginning of a new text). In those few cases in which these criteria did not suffice, we looked at font characteristics in order to make a final decision. Table 1 shows the number of texts per school subject and level. In total, the corpus consisted of 1055 texts.[5]

**Table 1.**
Number of texts per school subject and level

| Subject | Grade 5 | Grade 8 | Total |
|---|---|---|---|
| Biology | 161 | 87 | 248 |
| Geography – physical | 137 | 121 | 258 |
| Geography – human | 135 | 122 | 257 |
| History | 152 | 140 | 292 |
| Total | 585 | 470 | 1055 |

*5.2 Method of analysis*

For each text, excluding its heading, we applied binary coding, listing whether each of the following types of voice elements were present or not: 1) questions; 2) imperatives; 3) encouragements to imagine; 4) exclamations; 5) evaluations; 6) instances of the Dutch second-person singular pronoun "je"/"jij" ("you"); 7) instances of the Dutch first-person plural pronoun "we"/"wij" ("we").[6] A phrase could contain more than one type of voice elements. For instance, in (1), both the question and the pronoun "you" ("Do you prefer your clothes to look nice over them being comfortable?") were positively scored, while in (5), the evaluation ("Very

[5] There was an overlap of 980 texts between the voice corpus of Chapter 5 (*N*=1055) and the narrative corpus of Chapter 4 (*N*=999). Texts that were originally from other sources than the educational textbooks (*N*=19, e.g., testimonials from historical figures) were included in the narrative corpus but excluded from the voice corpus. In addition, texts that presented learning goals and/or an overview of what was coming next (*N*=75) were included in the voice corpus but excluded from the narrative corpus.

[6] In the Dutch language, the second-person singular pronoun "je" 'you' can have a personal interpretation, referring to the addressee exclusively, or a more generic interpretation, referring to the addressee as well as to any other individual (cf. Hogeweg & de Hoop, 2015). As the two interpretations of "je" are often difficult to tell apart, this distinction was left out of consideration in our analysis.

special, this European Union!") was also taken to be an exclamation. Voice elements in lines uttered by characters were only scored if these characters directly interacted with the student, and never if they were talking to each other. For instance, in (9), the student is directly addressed with "you(r)", leading to a positive score.

(9) Guten Tag! I am Matthias Sammer. I live in Berlin and I enjoy being your guide while you are exploring my country.
(*BuiteNLand*, geography grade 8, p. 17)

For imperatives, we excluded references to sources and other pages of the textbook, because the formulation of these references was arbitrary: some publishers used imperatives in their references ("see source 1"), while others only mentioned the source ("source 1"). For evaluations, a 0-bias was followed: only statements that were clearly evaluative received a positive score. In addition, the following instances did not count as evaluations: 1) intensifiers ("it was extremely warm"); 2) substantiated judgements ("the relative location is good: it is not far away and easy to reach"); 3) generally received judgements ("the climate in Spain is good"); 4) fixed expressions ("set a good example"); 5) judgements ascribed to others ("for many companies, the Netherlands was an attractive place of business"); and 6) instances of epistemic stance (how certain the author is about the given information, e.g., "apparently") or style stance (the manner in which the information is presented, e.g., "briefly").

*5.3 Inter-annotator agreement*

For considerations of reliability, 15% of the corpus ($N$=166) was coded by a second, independent annotator (cf. Neuendorf, 2002). This sample was randomly compiled for each school subject and grade level. Before the second annotator coded the sample, she engaged in a training phase to make her familiar with the procedure and the elements under investigation. The inter-annotator agreement was moderate to almost perfect ($.59<\kappa>1.00$) (cf. Landis & Koch, 1977), as shown in Table 2.

**Table 2.**
Inter-annotator agreement (Cohen's kappa and % agreement) per voice element

| Voice element | Cohen's kappa | % agreement |
|---|---|---|
| *Speech acts* | | |
| Questions | .91 | 97 |
| Imperatives | .97 | 99 |
| Encouragements to imagine | .60[7] | 97 |
| Exclamations | .91 | 98 |
| Evaluations | .59 | 89 |
| *Pronouns* | | |
| You | .98 | 99 |
| We | .97 | 99 |

The annotators discussed and resolved disagreements in their analyses to reach a final dataset. There was, for instance, a discussion on the subjectivity of the word "normal" in (10). It was reasoned that although this word is somehow evaluative (what is considered normal can vary from person to person), it is not used in an argumentative way here.

(10) The disease [AIDS] cannot be transmitted by sneezing, coughing, kissing or by using each other's cutlery. You can therefore continue to interact with AIDS patients or HIV positive people in a normal way without danger.
(*Biologie voor jou*, biology grade 8, p. 188)

*5.4 Statistical analysis*

The final dataset was analyzed using R version 3.6.1 (R Core Team, 2019). The analyses were completed via generalized linear mixed models, using the packages haven (Wickham & Miller, 2019), lme4 (Bates et al., 2015), emmeans (Lenth, 2019), and ggplot2 (Wickham, 2016). The fixed factors Subject and Grade level, and their interaction, were added to the models in a stepwise manner. Because some publishers did not design materials for all school subjects and/or grade levels under investigation, the statistical analyses did not allow for differentiation between publishers. To account for 1) potential differences in stylistic preferences between textbooks from different publishers and 2) correlations between texts for the two sub-domains of geography (which were selected from the same geography textbook, see also Section 5.1), Textbook was modeled as a random factor. Likelihood ratio tests were computed in order to assess which models fitted the data best. In the next section, we

[7] The Cohen's kappa score for encouragements to imagine is moderate because this element is only present in 19/1055 texts (1.8% of the corpus), see Section 6.1. When combining encouragements with imperatives, the inter-annotator agreement reaches κ=.85 and 97%.

discuss the results of the best fitting models. See Appendix C for an overview of all results.

## 6. Results

In this section, we sketch a general picture of the occurrence of voice elements in our corpus (Section 6.1), before presenting the results of our statistical analyses (Section 6.2).

*6.1 Overall occurrence of voice elements*

Figure 1 shows the number of texts in which the different types of voice elements were found. It demonstrates that "you" is by far the most commonly used element in the corpus (451/1055 texts). In the remaining analyses, encouragements were grouped with imperatives, because of its low number of occurrences (19), which prohibited statistical analyses.

**Figure 1.**
Number of texts in which the voice elements were found (*N*=1055)

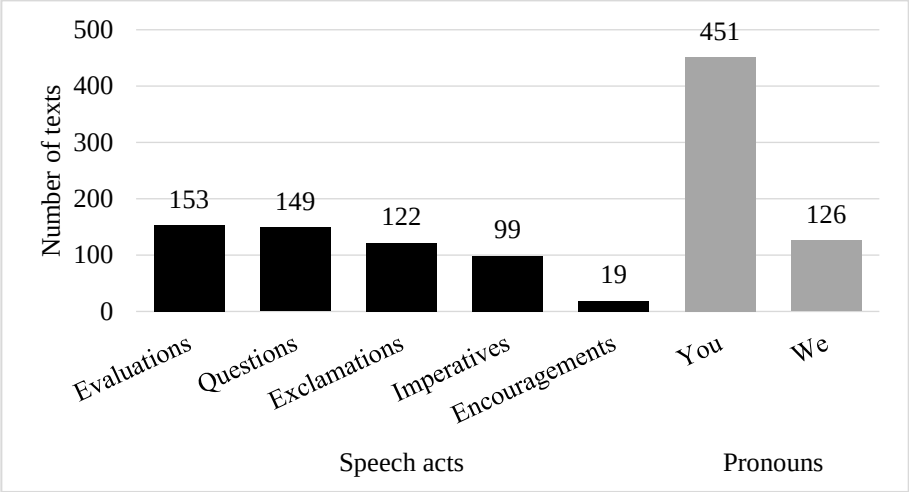
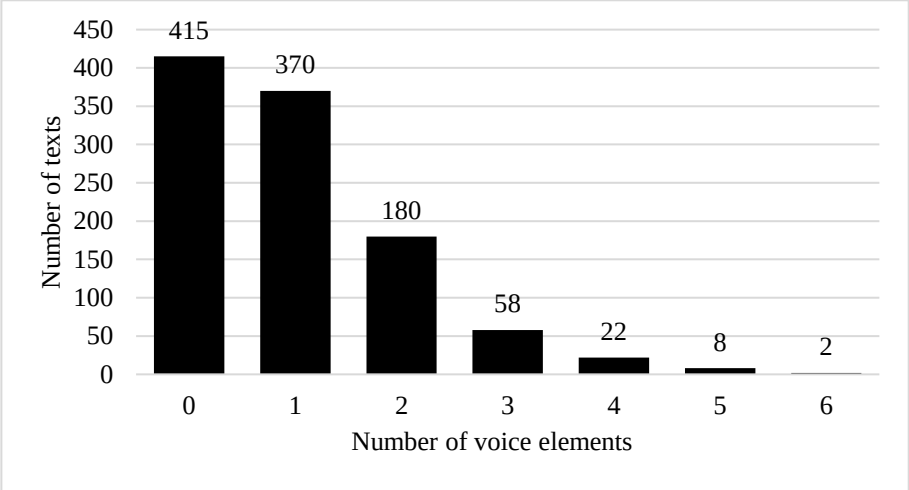



Figure 2 indicates that more than half of the texts exhibit one up to three types of elements (608). Only a small number of texts contain four or more types of voice elements (32), with two texts incorporating all six types. For example, in (11), we find the pronouns "you" and "we", a question ("Did you know that everything you eat comes from plants?"), an imperative ("Just think of"), an exclamation ("And a cow eats plants!"), and an evaluation of to-be-learned information ("something special").

**Figure 2.**
Number of texts per sum of different voice elements present in the text (*N*=1055)



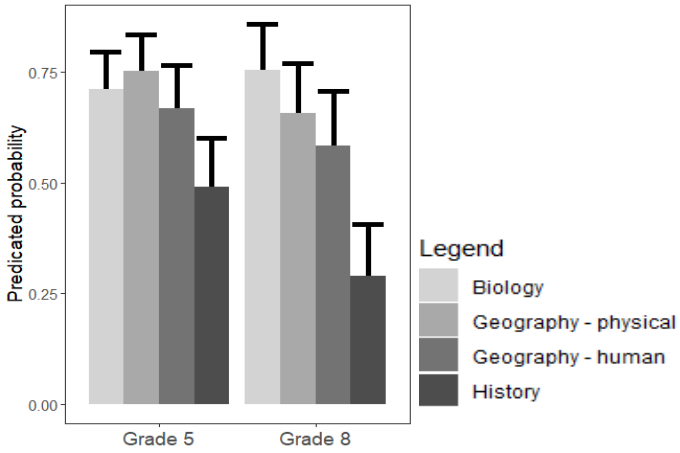

(11) Did you know that everything you eat comes from plants? Just think of strawberry jam and pasta, which is made of grain. Even when you eat meat, you actually eat plants. Because meat comes from a cow, for example. And a cow eats plants! Without plants, people and animals would have no food. There is something special going on with plants: they produce their own food. They do this in their leaves. Just like people and animals, plants are composed of very small living parts. We call them cells. You can compare them with bricks that form a house together.

(*Wijzer! Natuur & Techniek*, biology grade 5, p. 54)

*6.2 Statistical analyses*

First, we analyzed whether the distribution of educational texts with one or more types of voice elements (640/1055 texts) over the corpus was influenced by the fixed factors Subject, Grade level, and/or their interaction. For this analysis, which included all six types of voice elements, the best fitting model was the model in which only Subject was entered as a fixed factor ($\chi^2(3)=21.83$, $p<.001$). A post hoc Tukey pairwise comparison test revealed that, in general, voice elements are less often found in history texts than in texts for biology (*OR*=3.96, *SE*=1.18, *z*=4.64, *p*<.001), physical geography (*OR*=3.75, *SE*=1.09, *z*=4.56, *p*<.001), and human geography (*OR*=2.60, *SE*=0.75, *z*=3.35, *p*=.005), which is visualized in Figure 3.

**Figure 3.**
Predicted probability for texts with one or more voice elements




Subsequently, we clustered the six types of voice elements into two categories, one for speech acts (questions, imperatives, exclamations, evaluations) and one for pronouns ("you", "we"). For speech acts, the model in which Subject and Grade level, but not their interaction, were entered as fixed factors fitted the data best ($\chi^2(3)=8.58$, $p=.003$). A post hoc Tukey test revealed that speech acts are less frequent in history texts than in physical geography texts (*OR*=2.77, *SE*=0.80, *z*=3.54, *p*=.01), and that they are more frequent in grade 5 texts than in grade 8 texts (*OR*=2.17, *SE*=0.52, *z*=3.24, *p*=.026).

For pronouns, the best fitting model was the model in which only Subject was entered as a fixed factor ($\chi^2(3)=31.22$, $p<.001$). A post hoc Tukey test showed the same pattern as for the analysis with all voice elements, namely that pronouns are less often found in history texts than in text for biology (*OR*=5.65, *SE*=1.65, *z*=5.92, *p*<.001), physical geography (*OR*=4.72, *SE*=1.35, *z*=5.44, *p*<.001), and human geography (*OR*=2.89, *SE*=0.82, *z*=3.74, *p*=.001). The results for speech acts and pronouns are visualized in Figures 4 and 5.

**Figure 4.**
Predicted probability for speech acts

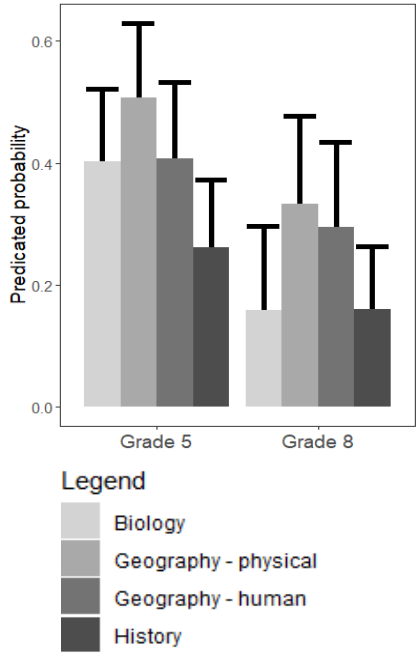
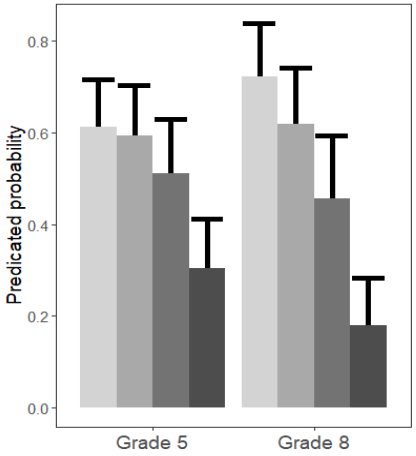



**Figure 5.**
Predicted probability for pronouns




Finally, we analyzed whether the general patterns persisted per voice element type. Below, we cluster the results by category (speech acts vs. pronouns). No interaction effects were found.

*Speech acts*

For questions and evaluations, no model significantly improved the base model. This implies a diversion from the general pattern for speech acts and shows that the distribution of these two types of elements is independent of Subject and Grade level.

For imperatives, the model in which Subject was entered as a fixed factor was the best fitting model ($\chi^2(3)=19.49$, $p<.001$). A post hoc Tukey test showed that imperatives are less frequent in history texts than in texts for biology (*OR*=10.46, *SE*=6.99, *z*=3.51, *p*=.003) and physical geography (*OR*=9.42, *SE*=6.28, *z*=3.37, *p*=.004).

For exclamations, the model in which both Subject and Grade level were entered as fixed factors was the best fitting model ($\chi^2(1)=18.91$, $p=.006$). A post hoc Tukey test showed that exclamations are less frequent in texts for human geography than in texts for physical geography (*OR*=2.53, *SE*=0.73, *z*=3.22, *p*=.029), and that exclamations are more common in grade 5 texts than in grade 8 texts (*OR*=7.70,

*SE*=3.28, *z*=4.80, *p*<.001). The results for imperatives and exclamations are displayed in Figures 6 and 7.

**Figure 6.**
Predicted probability for imperatives

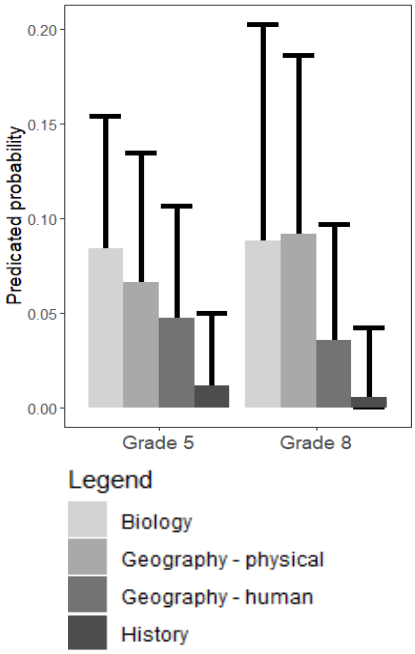
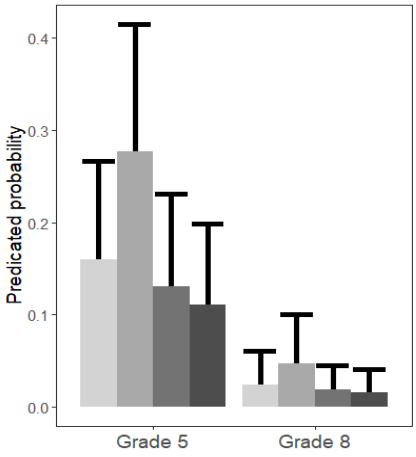



**Figure 7.**
Predicted probability for exclamations




*Pronouns*

Corresponding to the general patterns for pronouns, the best fitting model for "you" and "we" was the model in which only Subject was entered as a fixed factor ("you": $\chi^2(3)=27.46$, $p<.001$; "we": $\chi^2(3)=9.23$, $p=.026$. A post hoc Tukey test revealed that "you" is less often found in history texts than in texts for biology (*OR*=5.85, *SE*=1.91, *z*=5.41, *p*<.001), physical geography (*OR*=4.97, *SE*=1.59, *z*=5.03, *p*<.001), and human geography (*OR*=3.23, *SE*=1.03, *z*=3.68, *p*=.001), which is visualized in Figure 8. In addition, although a main effect of Subject was found for "we", a post hoc Tukey test did not reveal any significant pairwise comparisons. Nonetheless, as Figure 9 shows, the pattern was somewhat similar to that of "you", especially for grade 5.

**Figure 8.**
Predicted probability for "you"

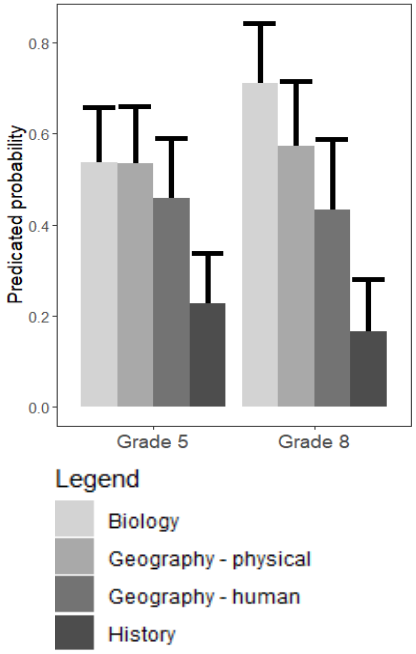
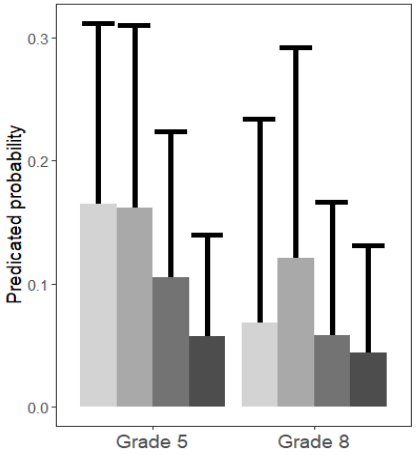



**Figure 9.**
Predicted probability for "we"




## 7. Discussion and conclusion

In this study, we focused on voice elements: textual elements that the author of an educational text uses to interact with students. By means of a quantitative corpus-based analysis, we investigated how and when voice elements are currently being used in Dutch educational texts, hypothesizing that the distribution of voice elements would be influenced by school subject (Hypothesis 1: HI<GH<GP=BI) and grade level (Hypothesis 2A: grade 5>8; Hypothesis 2B: grade 5<8). The significant pairwise patterns are summarized in Table 3.

**Table 3.**
Summary of the significant pairwise patterns

| Voice elements | Main effect of Subject | Main effect of Grade level |
|---|---|---|
| All | HI<GH=GP=BI | |
| *Speech acts* | *HI<GP* | *5>8* |
| Questions | | |
| Imperatives | HI<GP=BI | |
| Exclamations | GH<GP | 5>8 |
| Evaluations | | |
| *Pronouns* | *HI<GH=GP=BI* | |
| You | HI< GH=GP=BI | |
| We | -* | |

* Although a main effect of Subject was found, none of the pairwise comparisons reached significance.

Table 3 shows robust effects for the distribution of voice elements over school subjects. For both speech acts and pronouns, the effects generally support Hypothesis 1: most voice elements are less frequent in history texts compared to biology and geography texts. These findings suggest that educational publishers differentiate their use of voice elements over school subjects, taking the relatability of the educational content into account. Nevertheless, our distinction between physical and human geography texts appears to be less relevant than expected: rather than occupying an intermediate position between history texts on the one hand and biology and physical geography texts on the other hand, human geography texts tend to side with the latter two school subjects.

The lack of significant patterns in the third column of Table 3 signals that most voice elements are equally distributed over grade levels. Although an overall effect was found for the category of speech acts, this effect appears to be caused by only one element, namely exclamations. This indicates that for grade levels, neither Hypothesis 2A nor Hypothesis 2B is accepted: 1) voice elements are not used more frequently in secondary education texts to bridge an increasing gap between the educational content and students (2B “bridging student-content gap”), and 2) only limited evidence was found for the hypothesis that educational publishers strive for a progression from relatively simple to more challenging educational texts in their use of voice elements (2A “progression simple-challenging”).

In what follows, we aim at clarifying the similarities and variations in the distribution of voice elements over the corpus, discussing the general lack of differences between grade levels (Section 7.1), and seeking explanations for the variations in the distribution over school subjects (Section 7.2). Finally, we present directions for future research (Section 7.3).

*7.1 Differentiation over grade levels*

The occurrence of the different voice elements is highly comparable across grade levels, as only exclamations are more frequent in grade 5 texts than in grade 8 texts. This latter finding supports Hypothesis 2A, which predicted a decrease in the use of voice elements as texts at higher grades should display a progression from relatively simple to more challenging (cf. Brabham & Villaume, 2002; Shanahan et al., 2012; Snow, 2002). There may be two reasons why such an effect is found for exclamations. First, exclamations are an interactive means to express emotional and attitudinal aspects of communication that are easily recognizable in face-to-face interaction (e.g., tone of voice), but remain generally unobservable in written language (Bonvillain, 2020; Nystrand, 1986). Authors can use exclamations to stress content they consider important or remarkable, thus directing students' attention to specific parts of the educational text. They may believe that grade 5 students are less able to identify important and remarkable content than grade 8 students. Second, exclamations are generally considered less appropriate in an expository context (Clark & Pointon, 2016). Therefore, they tend to have a more informal status than other types of voice elements. This informality helps to put into words the amazement children experience while discovering new things in their world. As such, publishers may consider exclamations appropriate to enthuse children in grade 5, while they may choose to avoid using this kind of language in higher grades, because it may be experienced as childish. Of course, the two reasons may also be related.

Hypothesis 2A is not supported by the findings for the other types of voice elements. There may be several reasons why. For instance, it could be that publishers strategically consider the distribution of voice elements over educational texts, but that a decrease in use to enhance the complexity of texts (5>8, Hypothesis 2A) is cancelled out by an increase in use to bridge the increasing student-text gap (5<8, Hypothesis 2B). Alternatively, it could be the case that publishers are not as strategic in this respect as we expected them to be. That is, they might actually not pursue a deliberate distribution strategy with respect to the use of voice elements in educational texts, resulting in an accidental equal distribution of voice elements over texts for grade 5 and grade 8. However, such explanations cannot be substantiated on the basis of a corpus-based analysis alone. To this end, it would be relevant to discuss the current findings with publishers (see also Section 7.3).

Finally, as the findings of our corpus-based analysis never support Hypothesis 2B, which predicted an increase in the use of voice elements to bridge an increasing student-content gap, one could wonder to what extent there actually is variation in the student-content distance between different grade levels. In absolute terms, the educational content tends to be more complex in secondary education texts than in primary education texts (Committee Meijerink, 2009; Hidi 2000). However, in relative terms, the complexity of the educational content seems to be "growing" with students; concurrent with their expanding background knowledge, the

to-be-learned information gradually becomes more challenging, while the student-content distance remains unchanged. In this respect, it may be less necessary to increase the number of voice elements when shifting from primary to secondary education texts.

*7.2 Differentiation over school subjects*

The findings for school subjects generally support Hypothesis 1 (HI<GH<GP=BI), for both speech acts and pronouns. While "you" and "we" can be used in all school subjects relatively easily, they were found to be less frequent in history texts. This can be explained by the fact that in these texts, historical figures act as identifiable go-betweens: their presence makes it easier for students to view the educational content from different perspectives, making the to-be-learned information imaginable and relatable, and allowing the text's author to stay in the background (cf. Bartelds et al., 2020; Hidi, 2001; Kuijpers, 2014). By contrast, in biology and geography texts, it seems to be more essential for the author to step in as a mediator and directly address students to involve them with the educational content (cf. Nolen, 1995; Chapter 4 – Sangers et al., 2021). Similarly, for imperatives, the need to instruct students to react upon the educational content (e.g., by active thinking) seems to be less urgent in history texts than in biology and physical geography texts.

The lack of difference in the use of questions across school subjects may be explained by the fact that questions are a neutral and simple didactic tool to arouse students' curiosity to discover new information; questions can be used rather effortlessly to provide rhetoric structures to educational texts and/or lessons, stimulating inquiry-based learning (cf. Caram & Davis, 2005; Chaudhari, 1974). The explanation for the lack of difference in the use of evaluations, however, is less evident. For instance, it is not a matter of a limited number of instances (153/1055 texts). Nonetheless, we noticed that evaluations can be quite subtle, especially when formulated as adjectives (e.g., "He was a *smart* commander"; "Horses, donkeys, and zebra's yield *beautiful* crossings"). When writing educational texts, and particularly when attempting to write them in a vivid rather than dull way, it might be difficult to leave such evaluations out. Alternatively, our selection criteria and 0-bias might have been too strict to prompt pronounced variation in the distribution of evaluations.

*7.3 Suggestions for future research*

The present research has uncovered similarities as well as variations in the distribution of voice elements over Dutch educational texts. In future research, it would be worthwhile to discuss our findings with educational publishers. This would allow us to find out whether our findings arise from explicit design principles set by publishers or merely from individual authors' intuitions. To what extent do publishers deliberately diversify their use of voice elements over school subjects? And to what

degree are such design principles agreed upon between different authors or design teams working for the same publishing company? Earlier research has shown that interviews can be fruitful in discovering what publishers consider important textual elements, and how they adapt their design principles accordingly (Land et al., 2002).

Future research should also focus on the actual effects that voice elements have on students' engagement and comprehension of educational texts. To what extent do voice elements affect the distance between students and the educational content? To what extent do they enhance students' motivation and reading processes? Do different types of voice elements, or combinations thereof, lead to different effects? And to what extent do these effects fit publishers' design principles, intuitions, and current practices? Although the findings of Beck et al. (1995) provide a first indication that voice leads to beneficial effects on text comprehension (see also Section 1), it remains unclear what the exact effects of including voice elements in educational texts are, especially when focusing on elements that directly relate to the educational text's author.

Furthermore, there are some limitations to our study that give rise to new directions for future research. First, we focused on biology, geography, and history texts for grade 5 and grade 8. In future research, it would be interesting to expand the current research by examining the distribution of voice elements over additional school subjects and grade levels. It would also be worthwhile to explore the future use of automatic analyses; not only to expedite the method of analysis but also to more conveniently allow for inclusion of the relative distribution of the different types of voice elements over educational texts, which was left out of consideration in this study. Finally, besides voice elements, publishers can use other linguistic strategies to make their educational texts more engaging and comprehensible. These strategies provide fruitful directions for further study. One such direction is the narrative component of Beck et al.'s (1995) interpretation of voice, which was left aside in the present study, since our aim was to chart the distribution of textual elements that the author of an educational text uses to interact with students. Nevertheless, other voices can be incorporated in educational texts, such as those of narrative characters. The addition of such characters, as well as other narrative elements, to educational texts could be another means to provide students with proper, relatable contexts for the information they need to learn, thereby enhancing their reading processes (cf. Chapter 4 – Sangers et al., 2021).

It is hard to overestimate the importance of well-designed educational texts that provide relevant content in an engaging and comprehensible way. The inclusion of voice in educational texts could serve an important role in achieving this goal. The current study has specified Beck et al.'s (1995) notion of voice by defining it solely in terms of textual elements that directly relate to the author of an educational text. Our study has shown that author-initiated voice elements are quite extensively used in Dutch educational texts, and that their use is influenced by school subject. This

suggests that authors have intuitions about when voice elements are particularly helpful. A next step is to examine whether such intuitions are integrated into actual design principles concerning the use of voice elements in educational texts. In addition, having charted the current practices of using voice elements in educational texts, this study has provided an essential step to further investigate the promise of voice elements for designing better educational texts.

# Chapter 6

## Why or when to include narrative and voice elements in educational texts? Dutch publishers' opinions and policies

This study presents the results of two focus group sessions and a separate group interview on the opinions and policies of Dutch educational publishers regarding the use of narrative and voice elements in educational texts for biology, geography, and history, giving insight into the perceived advantages, disadvantages, and additional considerations publishers take into account during decision making concerning these elements. The three sessions make evident that publishers' motives for inclusion or exclusion of narrative and voice elements are not influenced by educational level (primary vs. secondary education), but do depend on school subject (biology vs. geography vs. history). In addition, two fields of tension that educational publishers encounter when deciding on the use of narrative and voice elements in educational texts are identified.

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## 1. Introduction

In present-day Dutch classrooms, educational textbooks play an essential role in the transfer of knowledge: 70 percent of students in primary education and 63 percent of students in secondary education are taught by using textbooks as the prime basis of instruction (Woldhuis et al., 2018). In order to acquire the to-be-learned information in educational textbooks, students need to sufficiently comprehend the texts these books include. Yet, whether students are capable of properly understanding educational texts does not only depend on their characteristics as readers (e.g., comprehension skills, background knowledge, motivation), but also on the reading activity and the quality of the texts (Snow, 2002).

Well-designed educational texts support the construction of a coherent mental representation that connects the content of the text to students' background knowledge (cf. Kintsch, 1998). Learning is stimulated if the representation expands this background knowledge or if it corrects previous misunderstandings (van den Broek, 2010). Thus, to ensure optimal learning, educational texts should be designed in such a way that they provide enough cues for students to establish a solid connection between the educational content and their background knowledge. This is especially important in texts for content-area subjects, such as biology and geography, because educational texts for these school subjects tend to introduce unfamiliar, subject-specific terminology, make use of academic language, and/or discuss topics that are not directly related to students' daily lives or background knowledge, and are therefore often difficult for students to read (Chambliss, 2002; Graesser et al., 2002; Schleppegrell, 2004). For instance, the biology text in (1) discusses the not so much self-explanatory term "biotope" (excerpt translated from Dutch).

(1) Lions live in Africa and penguins live on the South Pole. This way, every animal and every plant has a place where it can live well. Such a place is called a biotope. The biotope contains the right food, the proper climate, and sufficient shelter.

(*Natuurzaken*, biology grade 5, p. 40)

To provide students with adequate cues for the understanding of educational texts, Dutch educational publishers adopt a variety of strategies that seem intended to alleviate the abstraction level of the to-be-learned information, and to make the texts' content more relevant to students' daily life experiences and more engaging on the whole. Besides fully expository texts like (1), Dutch educational textbooks include texts that combine expository elements with all kinds of non-expository features. For instance, the educational content in the biology text in (2) is placed in a narrative context, with forester Jan explaining a group of children about the way of living of gregarious animals in the Lauwersmeer area.

(2) Forester Jan and the group of children carefully sneak to a herd of Konik horses. These are grazing. "These large grazers keep the grass nice and short," says Jan. "This way, we don't have to mow it all the time." The horses graze in small groups. A stallion is the boss. He determines where the group grazes. Caspian terns live in groups just like Konik horses. These birds search for food together. Forester Jan: "When a tern finds food, it warns the rest of the group. By roaring hard or by flying in a certain way. Such a form of communication is noticeable!"

(*Argus Clou Natuur en Techniek*, biology grade 5, p. 57)

In addition, in the geography text in (3), the author of the text interactively conveys educational content by asking students a question that relates this content to their own lives. Similarly, in the biology text in (4), the author addresses the students as being part of an in-group ("we") and as individuals ("you"), while actively referring to their background knowledge. Such author-initiated features, which make educational texts "speak" to students, are called voice elements (cf. Beck et al., 1995; Chapter 2 – Sangers et al., 2020).

(3) Are you sitting on a wooden chair at a wooden table at this moment? There is a good chance that the wood comes from Scandinavia. Over there in the taiga, millions of trees are cut down each year. This is done with gigantic machines.

(*Wijzer! Aardrijkskunde*, geography grade 5, p. 35)

(4) We never get tired of talking about the animal kingdom. You know hundreds of kinds of animals yourself. From ants to blackbirds, from sea lions to zebras. There are carnivores, herbivores, and omnivores. Some animals live in large herds. Others prefer to go their own way. There are even very different kinds of animals that help each other live. And let us not forget that, according to biologists, we also belong to the animals!

(*Binnenstebuiten*, biology grade 5, p. 11)

While we would expect Dutch educational publishers to apply narrative and voice elements with the aim of enhancing students' text comprehension and learning, we do not yet know publishers' specific rationales behind these strategies. Looking at Dutch educational textbooks, we encounter significant variation in the ways in which educational publishers incorporate narrative and voice elements in their texts. For instance, while narrative elements are often represented in history texts, they are less regularly incorporated in texts for biology and geography (Chapter 4 – Sangers et al., 2021). Conversely, voice elements are more frequently applied in biology and geography texts than in history texts (Chapter 5 – Sangers et al., submitted A). This

makes us wonder as to what motivates Dutch educational publishers to incorporate narrative and voice elements in their texts, and to what extent these motives are affected by variation in school subject (biology vs. geography vs. history) and/or educational level (primary vs. secondary education). Therefore, the following research question guided two focus group sessions:

> What are the opinions and policies of Dutch educational publishers regarding the use of narrative and voice elements in educational texts?

## 2. Method

We conducted two focus groups that were part of a half-day symposium at Utrecht University: one with educational experts for primary education and one with educational experts for secondary education. In this section, we discuss the selection of participants (Section 2.1), materials (Section 2.2), procedure (Section 2.3), and process of data analysis (Section 2.4). Our study was granted ethics approval by the Faculty Ethics Assessment Committee of the Humanities Faculty of Utrecht University (reference number: 3800776-01-01-2019).

### *2.1 Participants*

In the Netherlands, educational textbooks are developed by independent publishing companies that are free to translate government-set curricular objectives into educational materials. At present, the Dutch educational textbook market is dominated by four major publishing companies that have a combined 80 percent market share, namely Malmberg, Noordhoff Uitgevers, ThiemeMeulenhoff, and Zwijsen, and are closely followed by a fifth, upcoming publishing company named Blink (Bisschop et al., 2016). Table 1 shows the school subjects (biology vs. geography vs. history) and educational levels (primary vs. secondary education) these companies design educational textbooks for.

**Table 1.**
School subjects and educational levels for which the publishing companies design textbooks (📖)

| | Primary education | | | Secondary education | | |
|---|---|---|---|---|---|---|
| | BI | GEO | HI | BI | GEO | HI |
| Blink | 📖 | 📖 | 📖 | | | 📖 |
| Malmberg | 📖 | 📖 | 📖 | 📖 | 📖 | 📖 |
| Noordhoff Uitgevers | 📖 | 📖 | 📖 | 📖 | 📖 | 📖 |
| ThiemeMeulenhoff | 📖 | 📖 | 📖 | 📖 | 📖 | 📖 |
| Zwijsen | 📖 | 📖 | 📖 | | | |

We invited educational experts from all five companies to participate in our focus groups. The first focus group (labeled F1) was for primary education experts and the second focus group (labeled F2) was for secondary education experts. Of each company, at least one expert accepted our invitation to take part in our study. In total, five primary education experts participated in focus group 1 (2 male; 3 female), representing three out of the five companies, and eight secondary education experts in focus group 2 (2 male; 6 female), representing all four companies that publish secondary education textbooks. Primary education experts from one company were interested in taking part in our study but were unable to attend on the set date, and instead invited us for a separate group interview at their company one week later (labeled INT, 2 male; 1 female). In the three sessions, each of the school subjects (biology vs. geography vs. history) were represented by at least one expert. The experts worked as editor(-in-chief), portfolio manager, content manager and/or content developer.

*2.2 Materials*

Prior to the focus group sessions, we held a plenary introductory session in which we explained our interpretation of narrative and voice elements in educational texts. The goal of this introductory session was to ensure that we would start off the focus group sessions with a sufficient level of shared common ground, and to provide the experts with a set of example texts to refer back to. For ease of reference, these example texts were distributed on a hand-out. For an overview of the text examples included in the hand-out, see Appendix D. In this section, we present the definitions of narrative elements (Section 2.2.1) and voice elements (Section 2.2.2) that were discussed.

*2.2.1 Narrative elements*

Three narrative elements typically pertain to the context of educational texts (cf. Chapter 2 – Sangers et al., 2020). First, narrative educational texts represent two or more logically connected events that are particularized rather than generic: they take place only once, at one point in time and at one location, as opposed to recurrent phenomena (compare "Yesterday, Billy went to the Utrecht city cinema to see the new James Bond. He went for a drink at the Ubica bar afterwards" versus "Many people go to the cinema on weekends, visiting a bar afterwards"). Second, narrative educational texts contain at least one individual who experiences the events, either by taking active part in these events or by passively experiencing them. Third, narrative educational texts involve the representation of an inner world through the expression of thoughts, feelings, and/or sensory perceptions ("Billy was excited to see the movie").

The elements mentioned above are combined in various ways in Dutch educational texts, resulting in texts that range from fully- to less-pronounced narratives. An educational text is most narrative if it contains all three narrative

elements, as in (5). This history text represents a series of logically related particularized events, that focus on an army commander named Mauritius, of whom we gain insight in the inner world by the representation of his opinions ("Mauritius approves of this plan"), feelings ("Mauritius is terribly shocked"), and thoughts ("After all, the empire needs order and peace!").

(5) Army commander Mauritius has trouble falling asleep. Tomorrow, he and his troops will be travelling to Gaul, to quell a rebellion. Mauritius approves of this plan. After all, the empire needs order and peace! However, the emperor has given an additional order: Mauritius has to kill all the Christians in the area. Mauritius is terribly shocked: he is a Christian himself, just like his soldiers. What should he do? The following days he cannot think of anything else. When they arrive in Gaul, he has made up his mind: Mauritius and his men refuse to kill the Christians. The emperor is furious about his disobedience and, as a punishment, gives the order to assassinate Mauritius and his soldiers. Many years later, the church decided to canonize Mauritius as a saint. People started to worship and depict him.
(*Wijzer! Geschiedenis*, history grade 5, p. 43)

An educational text is less-pronounced narrative if it contains some but not all narrative elements. For instance, the history text in (6) represents a series of logically related particularized events that evolve around two characters, namely soldier Thomas and an unnamed gamekeeper. This text, however, lacks the explicit representation of the characters' inner world: while students get to know the contents of Thomas' plan, they gain no insight into his thoughts or feelings regarding his attempted escape. The same holds for the gamekeeper. Instead, students have to make inferences about the inner worlds themselves. Nonetheless, the text reads like a story.

(6) Many soldiers wanted to get out of the trenches. The British soldier Thomas James Highgate had a plan. On a day off he took off his uniform, put on ordinary clothes and went off. But he got lost and asked a gamekeeper for directions. This man turned out to be an Englishman, who immediately reported the fled soldier to the British army. On 8 September 1914 Thomas received the death penalty for his attempt to escape.
(*Eigentijds*, history grade 5, p. 15)

Correspondingly, the geography text in (7) describes the process of erosion by focusing on one particular case: logically related particularized events evolve around individualized natural objects (*one* cleft, *one* seed, and *one* tree) instead of the entire group of objects. While these non-conscious objects cannot be considered experiencing characters, and students will not automatically infer an inner world for

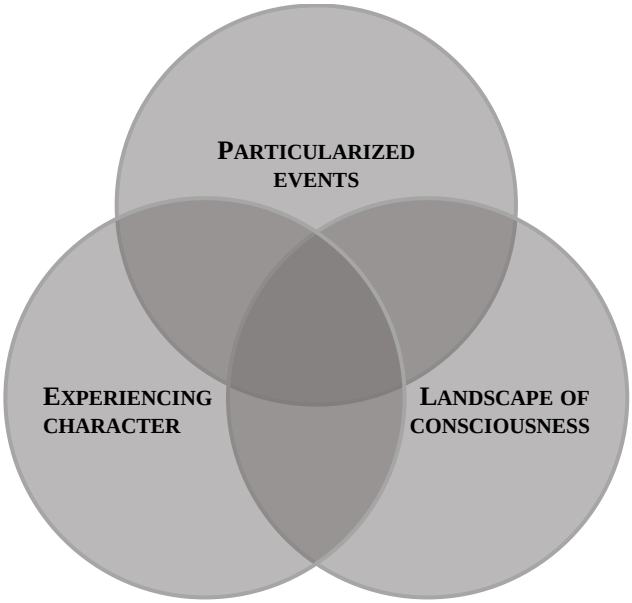
them (as opposed to the characters in (6)), this text still gives students the impression of being present in the center of the action.

(7) It started with a small crack in the rock. Moisture started to grow in it and at some point some seeds. A tree grew from one of those seeds. The roots of that tree penetrated further and further into the crack. And so the crack became wider and deeper. Snow and ice made the crack a little wider every year because water expands when it freezes. And then one day, this huge piece of rock broke loose and popped down...

(*Meander*, geography grade 5, p. 12)

The ways in which narrative elements are combined in Dutch educational texts are visualized in Figure 1. In this Venn diagram, each circle represents one of the three narrative elements, while the intersections depict the different combinations of elements. As Figure 1 shows, less-pronounced narrative texts, such as (6) and (7), evolve around more fully pronounced narratives, such as (5), classified in the center of the diagram.

**Figure 1.**
Different combinations of narrative elements identified in Dutch educational texts



*2.2.2 Voice elements*

Voice elements represent the features of an educational text that make it "speak" to students, imitating a "here and now" interaction between them and text's author (Beck et al. 1995; Chapter 2 – Sangers et al., 2020). As with narrative elements, various types of voice elements, as well as combinations thereof, are incorporated in Dutch educational texts. For instance, in (8), the author utilizes a question and an exclamation to introduce the text's topic: air. In addition, the author directly addresses students by using the pronouns "you" (individual) and "us" (in-group). Furthermore, the author uses an imperative to encourage students to do something ("Just blow…"), poses a second question, and evaluates the text's content ("That is really festive…").

(8) What are you unable to see, smell or touch, but does exist? Air! This invisible stuff is all around us. You cannot feel stationary air. Yet it takes up space. Just blow through a straw in a glass of lemonade. What you see are bubbles with air. And what about a balloon? That is really festive with a lot of air in it.

(*Argus Clou Natuur en Techniek*, biology grade 5, p. 52)

*2.3 Procedure*

At the beginning of each focus group, we informed the experts that we would ask for their opinions and policies regarding the use of narrative and voice elements in educational texts. This included questions on the advantages and disadvantages of using these elements, as well as the feasibility of incorporating them in texts for different school subjects (biology vs. geography vs. history) and educational levels (primary vs. secondary education). In addition, we focused on the experts' current policies of using narrative and voice elements in educational texts, asking about the guidelines they formulate with respect to these elements and the difficulties they come across during the design process. For an overview of all questions, see Appendix D. We stressed that all input was well-appreciated and that there were no wrong answers. After the experts formalized their collaboration through written informed consent and introduced themselves, the group discussion was started. Both focus groups lasted one hour. Audio recordings were made to expedite data processing. A similar procedure was followed for the separate group interview, which also lasted one hour.

*2.4 Data analysis*

After the audio recordings were transcribed and each response was converted to a single line in Excel, we analyzed the data using a grounded theory approach, distinguishing three non-linear phases of coding: open coding, axial coding, and selective coding (cf. Strauss & Corbin, 2015). In the open coding phase, we analyzed the data line-by-line, allocating *in-vivo codes* to the responses, adopting the phrasing used by the experts themselves (cf. Lyons & Coyle, 2016). In this phase, we also broke

lines that contained more than one substantial comment down into multiple Excel-lines, so that each comment could receive its own code. In the axial coding phase, we made connections between the open codes and reassembled them into larger categories, using umbrella codes (e.g., "meaningful learning", "motivation"). This refinement reduced the number of initial codes, and allowed for connections between related responses given in the various sessions. Finally, in the selective coding phase, we grouped the axial categories into core themes (e.g., "advantages"). The coding was carried out by a single coder, but to assure validity and reliability, an inter-observer assessed the consistency of the coding. There were only minor disagreements, which were resolved without difficulty.

## 3. Results

In this section, we present the opinions (Section 3.1) and policies (Section 3.2) that were discussed in the focus groups with experts for primary education (F1) and secondary education (F2), and in the separate group interview with primary education experts from one publishing company (INT) regarding the use of narrative and voice elements in educational texts. Readers should be aware that in various quotes, which we present by their English translations, the term "stories" seems to be used rather frequently to refer to both educational texts that are fully narrative and to texts with just one or two narrative elements. In addition, it appears that the term "stories" is occasionally used to cover voice elements. Where possible, we clearly indicate which quotes were specifically made about narrative elements, voice elements, and/or both.

### *3.1 Opinions*

The experts state that the current Dutch educational practice is highly goal-oriented: lesson goals have to be reached in a short period of time. For this reason, the experts' first objective is to convey the actual to-be-learned information, which is considered the most essential part of biology, geography, and history textbooks. Meeting this objective does not always leave enough room for the addition of narrative elements, which inevitably take up more time and space.

(9) Education is becoming more goal-oriented, of course. So if you do not touch the goal within five minutes... That is a bit exaggerated, but if time is limited, then you start to work in a goal-oriented way and then a nice story is sometimes scraped off. And that is actually a pity.

(F1, speaker 5, narrativity)

At first glance, the incorporation of narrative elements in educational texts thus does not appear to be self-evident. Nevertheless, these elements are quite commonly used in present-day Dutch educational textbooks (Chapter 4 – Sangers et al., 2021). Hence,

the question is what beneficial effects cause the experts to cross the limited time/space threshold.

*3.1.1 Advantages*

A first beneficial effect the experts mention is that narrative elements may contribute to conveying to-be-learned information in the three school subjects under discussion, especially when considering their significant value across the ages.

(10) If I go back all the way to the beginning: stories have always been the basis for conveying information, of course, from way back. So why not? Why should stories not be useful to convey information? It has always been that way.

(INT, speaker 1, narrativity)

In addition, narrative elements can be utilized to motivate students to want to learn more about the topic at hand and to activate them, or assist teachers doing so, at the beginning of the biology, geography, and history lesson. The experts agree that both motivation and activation are important factors for learning in all three school subjects, stating that elevation of these factors via narrative texts may lead to better learning than by offering texts that merely contain pallid educational content. However, as the experts point out, not all students are equally motivated and/or activated by texts with narrative elements, which is why the experts deliberately present students with a mix of genres in their textbooks.

(11) The reason for using elements like these was to increase motivation. For science, for example… students find it all very dry and factual (…). And then we try to add context and then maybe students will enjoy it and understand why this lamp is burning and why this room is warmed up.

(F2, speaker 6, narrativity)

(12) What you often see in the design of educational materials is that we try to get in closer proximity to students. So you come up with all kinds of things, like: how can you interest students? That is something you want to help teachers with, because they have the same problem. They start the lesson and want to get students involved. And you see that a lot of educational materials use those narrative elements, those introductory narratives, to reach that effect.

(F2, speaker 3, narrativity)

(13) I think it also has to do with students' preferences. Some students are very fact oriented and are eager to know how something works and what has happened, and they want to get to the very heart of the matter. And there are students who are not at all charmed by that, and who find factual information boring and are rather drawn to those narrative elements or just a good story. (…) So I think that educational materials should always consist of a combination [of genres].

(F1, speaker 5, narrativity)

Similarly, the experts emphasize the beneficial role of voice elements in activating students. They argue that voice elements trigger students to be interactively involved during biology, geography, and history lessons, and activate them to respond to the educational content, particularly when they are asked the right questions.

(14) I think the strength of voice elements is that they create interaction. Indeed, the best way is to ask students a good question. (…) A good question they would like to respond to.

(F1, speaker 5, voice)

Another frequently mentioned advantage of using narrative and voice elements in educational texts is that they stimulate meaningful learning (Dutch: *betekenisvol leren*). Both types of elements help bring the educational content in closer proximity to students, by relating it to their daily life experiences and/or background knowledge, and thereby, showing students its relevance for learning.

(15) There must be something meaningful to it, so that you can place it in your own frame of reference and relate it to your vocabulary and prior knowledge.

(INT, speaker 2, narrativity/voice)

Meaningful learning is relevant for multiple school subjects, as illustrated for science in (16) and history in (17).

(16) For science, they [i.e., narrative elements] are used to make the educational content more concrete, less abstract. So also to bring it in closer proximity to students.

(F2, speaker 1, narrativity)

(17) I think the most interesting thing is that you manage to scale down very large events to something students can understand. That is the big challenge, and I think you can do this very well with narrative elements, or at least by presenting it as a story.

(F1, speaker 5, narrativity)

Furthermore, the experts find it beneficial that narrative and voice elements can help students to put themselves in another time period (in history texts) or place (in geography texts).

(18) You actually want students to imagine themselves in history, and then stories are… how else can you ensure that they start to imagine and visualize what the past was like? I think stories play an important role there.

(F2, speaker 4, narrativity)

(19) If you talk about climate, landscapes, and the like, it can work very well if you challenge students to imagine what it is like to live there. That is, we have a certain climate that we are used to, but what is it like if you have beautiful weather throughout the year, 45 degrees in summer and it never rains? If you use, say, an example of a family or child living in such a country, then that can be very enriching for students' understanding, like: what does this actually mean?

(F1, speaker 5, narrativity/voice)

Related to imagining oneself in a historical time period, one expert mentions that it is important that students learn to distinguish between different historical perspectives, arguing that this can be taught by presenting different narrative characters and/or real historical figures in history texts.

(20) Different students might identify themselves with different characters, and from there we start examining: what would I have done in this case? If you were to omit narrative elements altogether, then you are in fact presenting history like "this is how it happened". While, of course, there is always room for discussion. And we would very much like to bring that discussion into the classroom, [and show] that you can consider events from different perspectives. To teach students to think critically.

(F2, speaker 4, narrativity)

A final advantage of narrative and voice elements in biology, geography, and history texts is of a more practical nature, namely that the use of these elements can help establish a connection between different lessons and/or chapters in the textbook.

(21) There is a formal side to it as well. (…) You can also use personal language towards students to connect themes or lessons. If you pick a character who directly addresses students at different points throughout the lessons, you obtain a connecting factor through language.

(F1, speaker 1, narrativity/voice)

*3.1.2 Disadvantages*

No disadvantages of incorporating voice elements in educational texts are mentioned by the experts. However, they do share several potential drawbacks of applying narrative elements. A shared concern is that narrative elements could distract students from the actual educational content in biology, geography, and history texts. The experts are afraid that students might focus on narrative details instead of the to-be-learned information, because they are unable to distinguish them from each other. According to the experts, this would result in confusion and, as a consequence, in studying incorrect parts of the textbook. In this respect, the experts are particularly concerned that students might get distracted by the expression or inferenced interpretation of a narrative character's inner world, as one expert explains by referring to the history text about army commander Mauritius in (5).

(22) Students often find it [i.e., reading texts with narrative elements] very difficult. They simply cannot see that the first paragraph is a story, an introduction, and that the rest is the actual to-be-learned information. That causes enormous confusion.

(F2, speaker 2, narrativity)

(23) That example of army commander Mauritius is obviously about: what happened in those days? What power did he have? There are all kinds of learning goals, but – as a student – I think: oh no, army commander Mauritius cannot sleep. Would he have been in a tent? What did that tent look like? And did he have a guard at the door? I am completely distracted. So then my whole lesson goal is lost, because – as a teacher – I want students to learn what the relation between the Gauls and the Romans was like. But I am with Mauritius in his tent. That distracts me.

(INT, speaker 1, narrativity)

To make sure students focus on the actual educational content, the experts claim that narrative elements should be clearly distinguishable from this content in biology, geography, and history texts. In addition, they explain that to prevent distraction by a narrative character's inner world, they deliberately consider the extent to which this element should be included in educational texts.

(24) What they ultimately need to know in terms of knowledge needs to be offered in an orderly fashion.

(F1, speaker 3, narrativity)

(25) How do you incorporate just enough of it, without creating too many distractors?

(INT, speaker 2, narrativity)

Another concern, raised by the primary education experts of focus group 1, is that the inclusion of narrative elements could shift the lesson's focus from pure knowledge transfer to increasing reading proficiency. According to these experts, this is highly undesirable for biology, geography, and history lessons. They even go a step further by claiming that reading in general should not be an impediment for learning in these school subjects. Accordingly, they claim that students should not be given assignments on narrative elements, and that these assignments should rather focus on the educational content itself.

(26) Reading does not even have to be an impediment. (…) We really want students to learn how to read properly, but if you are talking about these school subjects… they are not reading classes. Students with insufficient reading proficiency should still be able to study these school subjects without difficulty. And I have to say that I sometimes find it remarkable that texts still play such a central role.

(F1, speaker 5, narrativity)

By contrast, the secondary education experts consider reading "highly important" in biology, geography, and history lessons, arguing that it should also be part of the curriculum in these content-area subjects. The role of reading in biology, geography, and history lessons remained undiscussed in the separate group interview. However, since these primary education experts choose to integrate biology content in language arts lessons, we infer that they would rather agree with the secondary education experts.

A final reason for experts to be hesitant about including narrative elements in educational texts is the lack of empirical evidence on the effectiveness of these elements in biology, geography, and history texts. In all sessions, it was evident that the experts are on top of the Dutch literature on narrativity in the educational domain, having ample knowledge about studies on this topic, such as the dissertations of Land (2009) and van Silfhout (2014). This knowledge influences their opinions.

(27) Speaker 2: We do believe, of course, that it has to bring about certain learning outcomes. So if we would really have the impression that those are realized, then I would embrace it sooner, compared to what I am thinking right now: where is the evidence?

Speaker 1: That is exactly what I thought too: it has been proven [by van Silfhout] that narrative elements are not effective. For that reason, we have excluded it from one of our educational textbook series.

(INT, speaker 1 and 2, narrativity)

*3.1.3 Differences between school subjects and educational levels*

The above-mentioned advantages and disadvantages of using narrative elements show that there is some tension between the presence of these elements and the educational content that needs to be conveyed. This tension seems to be smaller for narrative elements in history texts than in biology and geography texts. Indeed, upon asking about potential variation in the use of narrative and voice elements in texts for the three school subjects, the experts state that they consider narrative elements most applicable in history texts.

(28) For history in particular, I think there should be more stories. (…) For geography and biology, this is much less [necessary]. These school subjects are more direct and in the present. For history, you really have to imagine yourself in another time. That is a totally different state of mind. (…) I would go for purely expository texts here [i.e., for biology and geography].

(F1, speaker 1, narrativity)

(29) For history, I think those three elements are not only the most important and easiest to incorporate, but they are also really of added value. I consider it really valuable if students try to imagine what it was like to be on a VOC ship for four months. (…) If you want to let students think about such a situation, it is very useful to incorporate all kinds of narrative elements. But for biology, this is less important, of course, because it is less about imagination and more about what do I perceive, what do I see happening. (…) In this case, I think it can be disadvantageous. It might be confusing if you incorporate all kinds of narrative elements, while the focus is on actual events or knowledge, or on describing what you perceive.

(F1, speaker 5, narrativity)

While the primary education experts of focus group 1 state that they prefer fully expository over narrative biology and geography texts, the primary education experts of the separate interview believe that narrative elements could also be beneficial in

texts for these school subjects. In addition, the secondary education experts argue that they would use voice elements rather than narrative elements in these contexts to relate abstract processes to students' daily life experiences.

(30) You can also do that with the circulatory system, for example. This can be compared to a city, where all kinds of things have to be delivered. You drive down the street and deliver a package here and there.
(F2, speaker 6, voice)

In contrast to the varying policies for different school subject, the sessions reveal that the experts do not attune the incorporation of narrative and voice elements between the primary and secondary education departments within publishing companies. Yet, the experts indicate that within both educational levels, the use of (fictitious) narrative elements is diversified over different grade levels, based on the students' age group.

(31) The ultimate thing, of course, is that it [i.e., the use of narrative elements] relates to students' perception of the world. A six-year-old is different from an eight-year-old and a ten-year-old. I think that that is the link that you are looking for, in relation to the knowledge you want to convey.
(F1, speaker 3, narrativity)

(32) We also very carefully considered the age group students belong to. That is, we only do this [i.e., include fictitious narrative elements] in the first year of secondary education [i.e., grade 7], and we will never do it in the higher grades. We considered [the views of philosopher] Kieran Egan, for example: seventh-graders are still in a romantic phase, they still want to be drawn into a story, and that is why it works very well for this age group. (…) Subsequently, students move on to a philosophical phase, and you should no longer include such a fictitious story.
(F2, speaker 4, narrativity)

*3.1.4 Additional considerations*

Apart from advantages and disadvantages, the experts discuss additional considerations for including or excluding narrative and voice elements. For instance, they state that they take the needs of three groups into account throughout the decision-making process: students, teachers, and the general public. As for students, the experts not only deliberately provide a mix of genres to accommodate varying genre preferences, but they also acknowledge the importance of inclusiveness, emphasizing that educational texts with narrative and/or voice elements should be relevant to *all* students. According to the experts, however, this aim for inclusiveness

sometimes complicates the design process, because it makes it more difficult for authors to come up with inspiring examples.

(33) For instance, in an educational textbook, you describe a family that goes on a holiday by air. This textbook is then used at a school in Amsterdam South-East and not a single student has the experience of flying. Well, then your example is completely off the mark. You cannot predict that in advance, of course, because you are designing a textbook for all students in the Netherlands. But that is very interesting, because then you have a class looking at you like: I have never flown, I know it exists, but… In that case, it suddenly becomes a lot more difficult to interact with that target group.

(F1, speaker 5, narrativity/voice)

(34) That is the tricky thing for us experts: you want to interest all students, without becoming too general or obvious, because (…) then we all come up with the same example.

(F1, speaker 5, narrativity/voice)

In addition to – and sometimes discordant with – students' needs, the experts assert that it is crucial for publishing companies to sell their textbooks on the educational market. Because teachers are often the ones deciding which textbooks will be used in class, experts identify them as a second group to bear in mind throughout the design process. The experts have the impression that the inclusion of narrative elements generally meets the needs of this group. For this reason, these elements are considered a unique selling point.

(35) For publishing companies, it is very important to incorporate in the educational textbook what they think customers will like. That is slightly different from whether it is actually effective. (…) It affects the choices you make.

(F2, speaker 3, narrativity/voice)

(36) We thought: these narrative texts might be a unique selling point, so to speak. Something interesting for this educational textbook, which really sets us apart. (…) That is why we use them in this particular educational textbook series.

(INT, speaker 1, narrativity)

A final group that has a bearing on decision making is the general public. The secondary education experts recount that in the past, the use of fictitious narrative

elements has resulted in public criticism. For this reason, they agree that texts with real narrative examples are often to be preferred over fictitious ones.

(37) What we have also learned by trial and error, especially recently, is that using fictitious examples can cause a lot of criticism, because: where does the story come from? (…) If all kinds of people experiencing things are made up, then other people have views on that. And then they say: what is the source of this example? Yeah, we made it up. That is not possible. (…) You will be flooded with criticism.

(F2, speaker 3, narrativity)

However, even though they identify the general public as a third group to bear in mind throughout decision making, the secondary education experts see a limit to the extent to which different opinions can be accommodated for in the design of educational texts with narrative elements.

(38) It is impossible to have everything checked anyway, because then where does it stop? If I let one party review my chapter (…), then I have to do this for all other chapters too (…). And especially with respect to biology, for each chapter there are so many organizations that would have an opinion on my chapter. Then I will never get the materials published.

(F2, speaker 6, narrativity)

The focus group sessions make it evident that the needs of the three groups do not always align. Upon asking whose needs eventually gain the upper hand in decision making, the experts indicate that particularly the trade-off between effectiveness (students' needs) and market value (teachers' needs) is quite complex, and that final decision making is influenced by all kinds of other factors as well.

(39) That is a fairly complex consideration, you know, because all sorts of things come into play. Do they do it [i.e., use narrative elements] at other publishing companies too? (…) Rivalry also plays a role. (…) And scientific insights, pedagogical things. (…) What are teachers used to?

(F2, speaker 3, narrativity)

Finally, the secondary education experts pay close attention to the ways in which narrative elements are included in the final examinations for secondary education, especially for science, as these are to be constructed via a context-based approach (Dutch: *concept-contextbenadering*). Since 2013 it is intended that students learn new concepts by encountering them in various contexts, which should enable students to derive their generic characteristics (cf. Bennett et al., 2007). Because the

newly-developed final exams occasionally include narrative elements – though not always in by the experts preferred ways – the experts stress the importance of including them in their materials as well, in order to optimally prepare students for their exams.

(40) Eventually, you have to prepare students for their final exams. So what is asked of them on the final exams? Students often have to work with contexts. And sometimes in a silly way, (…) you read this whole story, (…) and then the question is: what is the name of part P? And the answer is just something like "the lens of the eye". And then I think: why do I have this whole story?

(F2, speaker 6, narrativity)

*3.2 Policies*

Besides their opinions, we asked the experts about the extent to which they formulate overarching guidelines regarding the use of narrative and voice elements in educational texts (Section 3.2.1), and whether the writing of texts with these elements requires specific writing expertise (Section 3.2.2).

*3.2.1 Guidelines*

Although the experts give the impression that specific guidelines are formulated with respect to the use of narrative and voice elements in educational texts, they remain rather vague when asked to elaborate on actual guidelines.

(41) Well, you either do it [i.e., use narrative elements] or not. And if you do it, you do it like this and in that place. And then you have multiple flavors: you have several places; you have several ways to elaborate. And beforehand, you often discuss with your author team or editors: which flavor do we choose this time?

(F2, speaker 3, narrativity)

(42) Speaker 1: A very concrete one, for example, is that you use as few passive sentences and impersonal words as possible, but that you rather address students directly with “you”. Or that you no longer use “we”. “We are now going to...”.

Chair: Why not use “we”?

Speaker 1: Well, that could be a guideline. There could be all kinds of reasons… because it creates distance, for example. Or because it is considered old-fashioned. (…)

Chair: Why “you”?

Speaker 1: It differs, you can agree on either of them. It also differs, of course, per publishing company or educational textbook.

(F2, speaker 1, voice)

As the experts remained rather vague on actual guidelines, we cannot draw firm conclusions about this. Hence, we disregard this matter in the discussion (Section 4).

Even though the implementation of guidelines is generally verified by editors, this does not necessarily extend to the level of narrative and voice elements. In addition, while some experts indicate that they ask student and/or teacher panels to evaluate the incorporation of narrative and voice elements in educational texts, they point out that this is generally not done in detail, but rather in the light of to-be-achieved goals and levels of engagement.

(43) There is no verification for narrative elements. The author is free to apply those narrative elements, because that is what that author is for. (…) Subsequently, you present it to panels, of course, so you ask students to read it.

(F1, speaker 5, narrativity)

*3.2.2 Required writing expertise*

The experts consider the writing expertise required for educational texts with narrative elements different from that for educational texts with voice elements. All experts choose to have their narrative texts written by external authors, preferably writers of children’s books, because they consider the act of narrative writing an art it itself. The primary education experts of the separate interview explain that their trust in the writing skills of children’s books authors is so strong that they choose to have their expository texts written by these authors as well.

(44) We have most of the texts in our educational textbooks written by authors of children's books, so both narrative and informative texts, because it really is the art of writing. We make a comparative assessment: do we want to provide the content to children's books authors, or do we want to teach company-internal authors the art of writing? (…) For larger texts, it is simply easier, better, and more effective to give children's book authors the content.

(INT, speaker 3, narrativity)

By contrast, none of the experts hire external authors with the sole purpose of incorporating voice elements into educational texts. Nevertheless, one of the primary education experts asserts that voice elements are taken into consideration in the selection of company-internal authors.

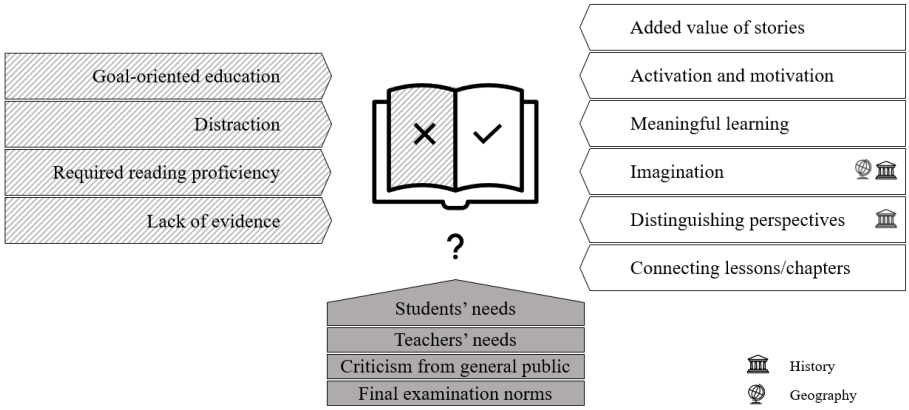
(45) I also have a very strong feeling that the company-internal author selection is partly based on writing style, and I think this relates closely to the use of those voice elements. (…) You look for authors whose natural style of writing is sort of like what you aim for.

(F1, speaker 3, voice)

## 4. Discussion

In this chapter, we have elaborately charted the advantages, disadvantages, and additional considerations that educational experts take into account when deciding on the inclusion or exclusion of narrative and voice elements in their materials, as illustrated in Figure 2. In what follows, we highlight two fields of tension experts encounter when deciding on the use of narrative and voice elements in their educational texts.

**Figure 2.**
Perceived advantages (blank), disadvantages (light grey), and additional considerations (dark grey) of using narrative and voice elements in educational texts




*4.1 Tension between the educational content and narrative/voice elements*

The sessions have demonstrated that, due to highly goal-oriented education, the transfer of to-be-learned educational content, which experts consider to be the most essential part of educational textbooks, is at odds with the use of narrative elements in educational texts. The extent to which narrative elements are ultimately incorporated in educational texts depends on the school subject: narrative elements are strategically added to history texts, because experts find it most valuable that students are stimulated to imagine themselves in another time period as well as learn to critically distinguish between different historical perspectives (cf. Houwen et al., 2020; Kropman et al., 2019, 2020). By contrast, experts consider these beneficial effects less imperative in biology and geography texts, which is why they choose to apply narrative elements less frequently in these contexts. Alternatively, in biology and geography texts, experts prefer the use of voice elements. These preferences perfectly align with experts' actual practice, as indicated by two corpus-based analyses on the distribution of narrative and voice elements over Dutch biology, geography, and history texts (Chapter 4 and 5 – Sangers et al., 2021, submitted A).

In contrast to the varying opinions and policies for different school subjects, experts do not express strong preferences for the diversification of narrative and voice elements over texts for different educational levels. This absence of strong opinions and policies can be related to corpus-based results, which show that experts do not differentiate the distribution of narrative and voice elements over Dutch primary and secondary educational texts (Chapter 4 and 5 – Sangers et al., 2021, submitted A). Judging by the educational literature's predominant perception that educational texts should reflect a progression from relatively simple to more challenging texts in the course of a school career (e.g., Brabham & Villaume, 2002; Shanahan et al., 2012;

Snow, 2002), this lack of differentiation could be considered a lost opportunity. That is, since narrative and voice elements alleviate the abstraction level of educational texts, an advancement in text difficulty could be facilitated by diversification of these elements over educational texts – not only between texts for different grade levels within the same educational level, but also between texts for primary and secondary education.

Although a progression from relatively simple to more challenging texts is generally accepted for the language arts, the focus group sessions exposed a fundamental debate on the role of reading proficiency in biology, geography, and history lessons. In this debate, the views of the primary education experts (of focus group 1) and the secondary education experts are diametrically opposed. That is, the primary education experts argue that the focus of biology, geography, and history lessons should fully be on knowledge transfer and not on increasing reading proficiency, because they fear that a focus on the latter would hinder students with inadequate reading proficiency to sufficiently acquire all to-be-learned educational content. As they are afraid that the inclusion of narrative elements in educational texts might complicate students' reading processes, and as a consequence, possibly impede their learning, the primary education experts are somewhat hesitant about the extent to which these elements should be included in biology, geography, and history texts. By contrast, the secondary education experts consider reading an essential component of all school subjects, also at the primary education level. They agree that if reading is disregarded during biology, geography, and history lessons in primary education, this is likely to complicate students' learning for these school subjects in secondary education, because students did not gain enough experience with reading texts in these contexts.

Based on scientific research, the primary education experts' fear that a focus on reading for reading proficiency in biology, geography, and history lessons would impede knowledge transfer remains unsupported: studies on the impact of integrating language arts (incl. reading) and science reveal that integrated approaches result in greater student achievement and improved student attitudes in *both* disciplines across all levels of primary education (for an overview, see Bradbury, 2014). This indicates that it is not only beneficial to integrate reading for reading proficiency in biology, geography, and history lessons, but that it is also worthwhile to incorporate educational content from the latter subjects in language arts lessons. In light of the tension caused by highly goal-oriented education, this offers an opportunity: since the reciprocity of an integrated approach allows for a transfer of biology/geography/history knowledge in multiple ways and in multiple lessons, this could alleviate the time/space tension experts experience during the design of educational texts. Accordingly, this might relieve a major objection against using narrative elements in educational texts, leaving more time/space for the beneficial effects of these elements to flourish. In this respect, it is important that future studies explore the best ways to

keep educational experts informed about ongoing scientific research. This will not only assist in bridging the current research-practice gap with respect to the role of reading in content-area school subjects, but will also help to prevent similar gaps in the future.

*4.2 Tension between marketing strategy and effectiveness*

Another field of tension that experts encounter is that between marketing strategy and effectiveness. Since successful sales are crucial for publishing companies and teachers have an important say in which textbooks schools will purchase, teachers' opinions are highly valued by experts – as became apparent at multiple occasions during the sessions, also from the suggestion that it would be particularly "interesting" if future scientific research could chart the opinions and practices of teachers regarding texts with narrative elements in more detail. Experts are under the impression that the inclusion of narrative elements corresponds with teachers' desire "to tell stories", and therefore experts see these elements as a "unique selling point". Thus, in view of teachers' needs, experts do not hesitate to include narrative elements in their texts.

Yet, in view of students' needs, experts are slightly hesitant about the inclusion of narrative elements in educational texts, because they are unsure about their actual effectiveness on students' reading and learning processes due to a lack of positive empirical evidence. The sessions made apparent that experts are on top of the Dutch empirical studies on this topic, and that the negative effects these studies report influence their opinions and policies. However, there is a need for refinement here. Although the Dutch literature mainly recounts negative results, international empirical studies paint a more varied picture. In fact, a close comparison of Dutch and international studies on narrativity in the educational domain reveals that no firm conclusions can yet be drawn about the relative effectiveness of narrative elements in educational texts, because these studies use different operationalizations of the notions "narrative" and "expository" (Chapter 3 – Sangers et al., 2019).

In order to arrive at well-founded conclusions, we need more research. To be able to disentangle previous conflicting empirical results new research should be *more systematic*, adopting more consistent approaches to the manipulation of genres in experimental texts (Chapter 3 – Sangers et al., 2019). In addition, new research should expand to *more target groups*. For instance, while both Land's (2009) and van Silfhout's (2014) research focus on Dutch pre-vocational secondary education, no empirical research on this topic has yet concentrated on Dutch primary education, nor the other levels of Dutch secondary education.[1] Moreover, new research should be *more detailed*. While the research of publishing companies mainly focuses on

[1] The Dutch system for secondary education is divided into three educational levels, ranging from theoretical to vocational training: pre-university education (Dutch *vwo*), senior general education (Dutch *havo*), and pre-vocational education (Dutch *vmbo*).

marketing strategies (e.g., do students/teachers like narrative texts? Are we achieving our goals?), we are interested in more profound questions regarding effectiveness (e.g., to what extent do narrative elements lead to enhanced engagement, reading comprehension, and learning?). Ultimately, both empirical research with students and in-depth interviews with teachers should decisively reveal the extent to which the tension experienced between the effectiveness of narrative elements (students' needs) and marketing strategy (teachers' needs) is legitimate.

Finally, we also need more research on the effectiveness of voice elements in educational texts. Up to now, voice elements have received relatively little research attention, and although one empirical study has provided promising results (see Beck et al., 1995), it remains unclear what the exact effects of including voice elements in educational texts are.

## 5. Conclusion

Our focus groups allowed for a fruitful exchange of thoughts on educational experts' motives to include or exclude narrative and voice elements in educational texts. Allowing us a peek behind the scenes of the design process of educational texts, experts enlightened us about the advantages, disadvantages, and additional considerations they take into account during decision making on using narrative and voice elements. In this respect, we learned that experts' motives for inclusion or exclusion of these elements are not affected by educational level, but that they do differ between the school subjects biology, geography, and history.

In addition to the valuable input experts have given us with respect to their opinions and policies regarding the use of narrative and voice elements in educational texts, we hope that our focus group sessions have made them more attentive to the potential of these elements as cues for students to establish a solid connection between the to-be-learned information in biology, geography, and history texts and their background knowledge. After all, we all agree that it is hard to overestimate the significance of well-designed educational texts.

# Chapter 7

## Giving an educational text voice: What does it do to students' text appreciation?

Voice elements make educational texts "speak" to their students, examples being questions or comments from the author. Educational publishers use voice elements with the aim of making educational texts more interesting for students to read, and consequently, easier to understand. It remains unknown, however, whether students truly prefer voice texts over non-voice texts. In this study, we investigate the validity of the assumption about the attractiveness of voice texts by means of an off-line reading experiment among Dutch fifth graders (*N*=99). Our findings indicate that while no appreciation differences are established in a free choice task, fifth graders predominantly prefer educational texts with voice elements over their non-voiced counterparts when they are urged to make a choice between the two. Hence, publishers appear to be on the right track with their assumption about the attractiveness of voice texts.

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## 1. Introduction

In order to achieve optimal learning, it is essential that students are able to sufficiently comprehend the educational texts they need to learn from. Engagement has been argued to be a critical component for the comprehension of educational texts: students who find their educational texts interesting to read are likely to be more engaged and better motivated to actively process the to-be-learned information represented in these texts. Active processing leads to higher attention to the educational content, which stimulates deeper understanding and better learning of this content (cf. Beck et al., 1995; Brozo et al., 2007; Guthrie & Wigfield, 2000; Hidi, 2001; Sadoski, 2001; Schraw & Lehman, 2001).

Students' level of engagement is influenced not only by their personal interests, but also by the nature of the reading activity (e.g., reading at one's own pace or participating in class reading) and characteristics of the educational text itself (e.g., content, form, and style) (cf. Beck et al., 1995; Snow, 2002). When it comes to the text, Dutch educational publishers adopt various strategies to make their texts more engaging for students (cf. Chapter 2, 4 and 5 – Sangers et al., 2020, 2021, submitted A). Besides fully expository texts, such as the geography text in (1), publishers design educational texts that include all kinds of non-expository elements. For instance, in the geography text in (2), educational content about the influence of the weather on the quality of harvest is placed in a narrative context, with farmer's son Joël sharing his experiences as a grape picker. In addition, in the geography text in (3), the author of the educational text relates educational content about weather changes to students' own lives by asking them questions, addressing them directly ("you", "our"), and giving them an evaluation of the text's content ("quite nice!").

(1) The world has different climate zones. The zones flow smoothly into each other, there are no borders, as with a country. Several influential factors determine the climate. The location on the earth, for example: the closer an area is to the equator, the warmer its climate is. The presence of seas, oceans, and mountains also influence the climate. This is why the same climate zones can be found in different parts of the world.

(*Grenzeloos*, geography grade 5, p. 25)

(2) Joël is the son of a winegrower. Together with the pickers, he brings in the harvest. While he takes a rest, he says: "It's been a good year. There was a lot of sun, but also enough rain. This allowed our grapes to grow well, and now they are nice and sweet. The weather was just perfect. Last year, the harvest failed. Back then it was too wet and too cold in July. With such weather, the grapes don't ripen well."

(*Wijzer! Aardrijkskunde*, geography grade 5, p. 6)

(3) Have you ever been on a holiday to Italy? Or to Spain at the coast? In what season where you there? Maybe it was in the summer, when it is very hot there. But if you go there in spring or fall, it feels like the summer in our country. And in the winter the temperature over there is the same as during our spring or fall. So, quite nice!

(*Argus Clou Aardrijkskunde*, geography grade 5, p. 17)

Vividness seems to be a promising notion for the characterization of the non-expository elements in (2) and (3). Texts are designed in a vivid way to attract and hold readers' attention and excite their imagination to the extent that the content is "1) emotionally interesting, 2) concrete and imagery-provoking, and 3) proximate in a sensory, temporal, or spatial way" (Nisbett & Ross, 1980, p. 45).

The first two dimensions of vividness have regularly been associated with narrativity: as texts with narrative elements are often emotionally interesting, use concrete language, and excite readers' imagination, they have been identified as vivid texts and posited to have more impact on readers than texts that merely convey abstract content (Nisbett & Ross, 1980). As such, the narrative context in (2) is argued to be more engaging than the fully expository nature of (1).

In addition, the proximity dimension of vividness can be linked to textual elements that decrease the distance between the reader and the text's content through a "here and now" interaction between this reader and the text's author, also known as the "voice" of the text (cf. Beck et al., 1995; Chapter 2 – Sangers et al., 2020). Voice elements represent those features of an educational text that make it "speak" to students. Besides asking questions, directly addressing students as individuals with "you(r)" or as members of an ingroup with "we"/"us"/"our", and giving evaluations, as in (3), the author of an educational text can manifest themselves by using exclamations and/or imperatives (cf. Chapter 2 – Sangers et al., 2020). For instance, in the geography text in (4), the author encourages students to imagine traveling along to the Kilimanjaro, and includes an exclamation to stress the variety of different climates present on this mountain (indicated by an exclamation mark).

(4) There are places in the world where all kinds of climates come together. Just travel along to the mighty mountain Kilimanjaro. It is located in African Tanzania and with its 5892 meters, it is the highest mountain of Africa. The Kilimanjaro was formed by three volcanoes. Although the Kilimanjaro is located in the tropics, not far from the equator, you can find different climate zones on the mountain. At the foot of the mountain are savannas and on the highest peaks there is snow!

(*Grenzeloos*, geography grade 5, p. 30)

Corpus-based research shows that both narrative and voice elements are quite commonly used in Dutch educational texts: 45 percent of the texts in a corpus of biology, geography, and history texts for grade 5 and grade 8 (*N*=999) contain one up to three prototypical narrative elements, while more than 60 percent of the texts in a similar corpus (*N*=1055) contain one up to six different types of voice elements (Chapter 4 and 5 – Sangers et al., 2021, submitted A).[1] This frequent use of both vividness-increasing strategies can be explained by Dutch educational publishers' belief that narrative and voice elements make educational texts more interesting for students to read and easier to relate to, and as a result, easier to understand and learn (Chapter 6 – Sangers et al., submitted B). It remains unknown, however, whether Dutch students indeed prefer educational texts with a higher degree of vividness over their less vivid counterparts.

In the current study, we investigate the validity of the assumption about the attractiveness of vivid educational texts, focusing on Dutch students' appreciation of educational texts with and without voice elements. If students prefer educational texts with voice elements over texts without these elements, this would support publishers' rationale for including voice elements in educational texts. By contrast, if such inclusion does not positively influence students' text appreciation, this would diminish or eliminate one of the fundamental reasons for using voice elements in educational texts. Therefore, we conducted an off-line reading experiment, which was guided by the following research question:

> To what extent do Dutch students appreciate educational texts with and without voice elements differently?

In what follows, we clarify the method of our experiment (Section 2). Subsequently, we describe the experimental results (Section 3). Finally, we turn to our discussion (Section 4).

## 2. Method

By means of an off-line reading experiment, we examined the extent to which Dutch students appreciate texts with and without voice elements differently. In this section, we describe the participant details (Section 2.1), materials (Section 2.2), procedure (Section 2.3), inter-annotator agreement (Section 2.4), and method of data analysis (Section 2.5). Our study was granted ethics approval by the Faculty

[1] The analyzed prototypical narrative elements were 1) particularized event, 2) experiencing character, 3) landscape of consciousness (cf. Chapter 4 – Sangers et al., 2021). The analyzed voice elements were 1) instances of "you(r)", 2) instances of "we"/"us"/"our", 3) questions, 4) evaluations, 5) exclamations, 6) imperatives (cf. Chapter 5 – Sangers et al., submitted A).

Ethics Assessment Committee of the Humanities Faculty of Utrecht University (reference number: 20-252-02).

*2.1 Participants*

Ninety-nine Dutch fifth graders (46 girls) participated in the study, with ages ranging from 9 to 11 years (*M*=10.28). Students were recruited from two primary schools in the Netherlands. All but four students were native speakers of Dutch. Five students were diagnosed with dyslexia. All students were unaware of the experiment's purpose.

*2.2 Materials*

*Educational content.* Since voice elements have been argued to decrease the distance between the educational content and students – making this content more accessible for them to understand and learn –, these elements seem to be most beneficial in educational texts that convey to-be-learned information that is not readily relatable. For instance, the physical-oriented geography content about the climate in (1) is rather abstract and not something students deal with on a daily basis. By contrast, the more human-oriented geography content in (5), about the benefits of people's usage of the Internet, is more concrete and easier for students to relate to, as all students use the Internet regularly and know the different ways in which people make use of it. Accordingly, there is a larger distance between the educational content and students in (1) than in (5).

(5) Not only things that are bought on the internet, but also ideas, music, research, art, news, videos, and knowledge are transferred wirelessly or via cable to countless people. For example, researchers who want to cure diseases can share their research results with colleagues working in laboratories around the world. This way, they do not all have to research the same thing and can come up with a solution more quickly.
(*Grenzeloos*, geography grade 5, p. 47)

While voice elements can be included in both (1) and (5), it seems plausible that students value these elements more in the first text, because they require more of a helping hand to connect the educational content to their own world. To take into account potential variation in students' appreciation of texts with and without voice elements on the basis of the nature of the educational content, we divided the school subject geography into two sub-domains, namely physical geography (GP) – with a focus on natural phenomena – and human geography (GH) – with a focus on human-related phenomena.

*Texts.* Eight topics were selected for the creation of experimental texts: four for GH (the European Union, emigration, population distribution, globalization) and four for

GP (the Dutch climate, the ocean, agriculture and climate, the African mountain Kilimanjaro).[2] Using present-day Dutch educational textbooks as a source of inspiration, two text versions were constructed per topic: one text with voice elements (V) and one text without voice elements (NV). Per topic, the V- and NV-text provided the same educational content and were of equal paragraph length. See Appendix E for a representation of the full experimental texts.

V-texts combined multiple types of voice elements (i.e., instances of "you(r)", instances of "we"/"us"/"our", questions, evaluations, exclamations, and/or imperatives). For instance, the V-text in (6), about oceans, includes three types of voice elements, namely instances of "you", exclamations ("in fact, there is only one!"), and questions ("If there is only one ocean, why did we come up with all these different names?"). NV-counterparts, such as (7), were written in an impersonal style, without any voice elements.

(6) You may think there are many oceans in our world. That is incorrect: in fact, there is only one! This is because all the water around the continents is connected. You will not notice if you sail south of South America from the Atlantic Ocean into the Pacific Ocean. Well, nothing? It can be quite stormy. If there is only one ocean, why did we come up with all these different names?

(7) Many people think there are many oceans in the world. That is incorrect: the world has only one ocean. This is because all the waters around the continents are connected. Skippers will not notice this when they sail south of South America from the Atlantic Ocean into the Pacific Ocean. Or maybe a little. It can be quite stormy. Although there is only one ocean, its parts have all kinds of different names.

*Booklet versions*. The experimental texts were included in booklets, which were presented to students in printed form. There were eight booklet versions, so that the order of different condition combinations (voice x geography sub-domain) could be counterbalanced. Each booklet version contained six out of eight topics. See Appendix E for an overview of the distribution of topics and conditions over booklet versions.

*Tasks*. Students completed three tasks. While task 1 and task 2 were designed to investigate students' preferences for texts with and without voice elements in two different ways, namely via free choice (task 1) and forced choice (task 2), task 3 was

[2] All texts were introduced as geography texts. Accordingly, students were unaware of our distinction between GP texts and GH texts.

developed to examine the extent to which students were able to accurately point out stylistic differences between the two text versions. While Dutch fifth graders have been introduced to genre and style variations, they do not receive explicit instructions on voice elements.

During task 1 (free choice), students read four texts, one for each combination of conditions (i.e., V-GH, NV-GH, V-GP, NV-GP) and all on a different topic. After students read a text, they turned the page of their booklet to find a list of six appreciation statements, which assessed the extent to which they considered the text 1) nice to read, 2) interesting to read, 3) easy to understand, 4) easy to study for a test, 5) clearly written, and 6) giving them the feeling that the author of the text was directly addressing them. For each of the statements, which were the same for all four texts, students circled an emoticon on a five-point emoticon-scale, ranging from highly negative (angry emoticon) to highly positive (overjoyed emoticon):

Subsequently, students answered an open-ended comprehension question that was tailored to the text's topic (e.g., "The world has only one ocean. Why have people come up with different names for it?"). This question was included to ensure that students would read each text attentively. The answer to the comprehension question was explicitly stated in the text. To prevent students from merely looking up the correct answer instead of writing down what they remembered, students were not allowed to look back in the text once they started responding to the appreciation statements.

During task 2 (forced choice), students read both the V-version and the NV-version of a certain topic. They did so once for a GH topic and once for a GP topic. Students had not previously read these topics during task 1. Although students were not made aware of any stylistic differences between the V- and NV-text versions, they were now urged to choose between the two. For three appreciation statements, students were requested to indicate which of the two text versions they considered 1) nicest to read, 2) most clearly written, and 3) addressing them most directly. They could also opt for a third "no preference" option. During this task, students were allowed to look back into both texts, which were printed directly above the appreciation statements.

During the final task (noticing voice differences), students were informed that each set of texts they had just read during task 2 were on the same topic but were written in a different way. Students were then asked to write down per text set as many differences as they had noticed between the two texts. To complete this task, students were allowed to look back into the texts of task 2.

*Pre-test*. The texts and tasks were pre-tested to verify their feasibility for fifth graders. Although no textual adjustments needed to be made, the pre-test indicated that two-sided printing of the booklets caused confusion during page turning. Therefore, all booklets were printed one-sided.

*2.3 Procedure*

Due to COVID-19 restrictions, we were unable to visit the primary schools in person. Instead, we sent the booklets to the schools by post, accompanied by a small gift for the students (a pencil with an eraser) as well as one for their teacher (a box of chocolate). We recorded an instruction video and a closing video, which were both sent to the teacher by e-mail. The instruction video, played prior to the experiment, was made to ensure that all students received the same instructions. The closing video, played right after the experiment, informed students about the experiments' purpose, taught them about stylistic differences, and enabled them to talk about their experiences during the experiment. Both videos also guaranteed that the teacher's workload was kept to a minimum.

The experiment was administered by the own class teacher in the regular classroom. The eight booklet versions were distributed among students in a random fashion. Students were told that there was no point of copying their neighbors' answers, as we were interested in their personal opinions. The average time students spent on the three tasks was about 30 minutes in total.

*2.4 Inter-annotator agreement*

The comprehension questions were scored as either correct or incorrect by the first author. Additionally, for considerations of reliability, 15 percent of the questions ($N$=60) were scored by the second author (cf. Neuendorf, 2002). The inter-annotator agreement score was almost perfect ($\kappa$=.834). Minor disagreements were solved without difficulties.

*2.5 Data analysis*

The data from the comprehension questions and task 1 (free choice) were analyzed with R version 3.6.3 (R Core Team, 2020), using the packages haven (Wickham & Miller, 2019), lme4 (Bates et al., 2015), emmeans (Lenth, 2019), and gmodels (Warnes et al., 2018). The analyses were completed via (generalized) linear mixed models, in which the fixed factors Voice (voice vs. no voice) and Sub-domain (human vs. physical geography), as well as their interaction, were added in a stepwise manner, with Participant and Topic modeled as random factors. Likelihood ratio tests were computed in order to assess which model fitted the data best at the .05 $\alpha$-level.

The data from task 2 (forced choice) were analyzed with IBM SPSS Statistics 26. The analyses were completed via general loglinear analyses, in which models that included the fixed factors Voice (voice vs. no voice vs. no preference) and

Sub-domain (human vs. physical geography), and/or their interaction, were selected via a step-down procedure. The selected models only retained effects that significantly improved the model fit, based on Pearson's chi square tests at the .05 α-level. See Appendix F for an overview of all results.

## 3. Results

In this section, we first describe a randomization check and the analysis of the comprehension questions (Section 3.1). Subsequently, we report on the results for task 1 (Section 3.2), task 2 (Section 3.3), and task 3 (Section 3.4), and describe some additional, exploratory statistical analyses that followed from the results of task 3 (Section 3.5).

### *3.1 Prerequisites*

*Randomization check.* There were no significant differences between the eight booklet versions with respect to age ($F(7,89)=0.80$, $p=.592$), gender ($\chi^2(7)=7.66$, $p=.363$), native language ($\chi^2(7)=8.56$, $p=.286$), and dyslexia ($\chi^2(7)=6.63$, $p=.468$).

*Comprehension questions.* Almost 80 percent of the students answered two or more out of four questions correctly. Although two students had a comprehension score of zero points, exclusion of their data did not lead to significant changes in the patterns reported below. Hence, all students' data were included in the analyses. For the comprehension questions, no model was found to significantly improve the base model (Model 1: $\chi^2(1)=2.35$, $p=.126$; Model 2: $\chi^2(1)=0.22$, $p=.641$; Model 3: $\chi^2(1)=0.00$, $p=.977$). This indicates that we could not establish any differences in students' answers to the comprehension questions between conditions.

### *3.2 Task 1: free choice*

A Cronbach's alpha reliability analysis showed that the six appreciation statements of task 1 – nice to read, interesting to read, easy to understand, easy to study for a test, clearly written, and directly addressing – measured the same construct ($\alpha=.73$). Therefore, all statements were combined into a new dependent variable: appreciation. The means and standard deviations for appreciation are presented in Table 1.

**Table 1.**
Means (and standard deviations) for appreciation

| | Voice | No voice |
|---|---|---|
| Human geography | 3.71 (.72) | 3.65 (.68) |
| Physical geography | 3.87 (.62) | 3.75 (.74) |
| Total | 3.79 (.68) | 3.70 (.71) |

Table 1 demonstrates that students general attitude towards the experimental texts of task 1 was above neutral. Statistical analysis showed that no model significantly improved the base model (Model 1: $\chi^2(1)=2.46$, $p=.117$; Model 2: $\chi^2(1)=2.36$, $p=.125$; Model 3: $\chi^2(1)=0.34$, $p=.562$), indicating that we could not establish any differences in students' appreciation of texts with and without voice elements, irrespective of geography sub-domain.

*3.3 Task 2: forced choice*

A Fleiss' kappa reliability analysis indicated that the three appreciation statements of task 2 – nicest to read, most clearly written, and addressing most directly – did not measure the same construct ($\kappa=.203$). Therefore, each statement was analyzed separately.

For all three statements, the general loglinear analysis produced a final model that only retained the fixed factor Voice (nicest to read: $\chi^2(3)=0.06$, $p=.996$; most clearly written: $\chi^2(3)=0.46$, $p=.927$; addressing most directly: $\chi^2(3)=1.45$, $p=.693$), revealing a main effect of Voice (nicest to read: $\chi^2(2)=18.16$, $p<.001$; most clearly written: $\chi^2(2)=7.55$, $p=.023$; addressing most directly: $\chi^2(2)=42.85$, $p<.001$). This indicates that voice – but not geography sub-domain (nor the interaction) – significantly affected students' text preferences. Table 2 shows the number of students (and percentage) per voice-choice per sub-domain for each statement.

**Table 2.**

Number of students (and percentage) per choice per sub-domain (human geography – GH; physical geography – GP) for the three appreciation statements

| | Nicest to read | | | | Most clearly written | | | |
|---|---|---|---|---|---|---|---|---|
| | GH (*N*=98) | | GP (*N*=97) | | GH (*N*=98) | | GP (*N*=97) | |
| Voice | 47 | (48%) | 45 | (46%) | 38 | (39%) | 42 | (43%) |
| No voice | *29 | (30%) | *30 | (31%) | 35 | (36%) | 31 | (32%) |
| No preference | *22 | (22%) | *22 | (23%) | *25 | (26%) | *24 | (25%) |

| | Addressing most directly | | | |
|---|---|---|---|---|
| | GH (*N*=98) | | GP (*N*=98) | |
| Voice | 57 | (58%) | 53 | (54%) |
| No voice | *22 | (22%) | *19 | (19%) |
| No preference | *19 | (19%) | *26 | (27%) |

*$p<.05$

Looking at the first appreciation statement, there were more students who considered the V-text nicest to read than students who preferred the NV-text ($z=2.66$, $p=.008$) or did not have a preference for either text variant in this respect ($z=4.02$, $p<.001$). Similarly, more students felt most directly addressed by the V-text than by the NV-text ($z=5.39$, $p<.001$) or than the number of students who did not make a choice

for either text variant in this respect ($z$=5.05, $p$<.001). In addition, the number of students who found the V-text most clearly written was higher than that of students who did not have a text preference in terms of clarity ($z$=2.70, $p$=.007), but it did not differ from the number of students who preferred the NV-text in this respect ($z$=1.16, $p$=.247).

*3.4 Task 3: noticing voice differences*

During task 3, students wrote down the differences they noticed between the V- and NV-text versions of task 2. Although more than half of the students indicated that they sensed some variation between the two text versions, they were not always able to pinpoint concrete differences, as illustrated by the quotes in (8). In addition, some students reverted to the personal opinions they shared in task 2, as shown in (9).

(8)

a. "They have approximately the same information but with different phrases."
b. "They are written in a different way but mean the same thing."
c. "They are the same texts but the words in A are different from those in B."

(9)

a. "Text A [= V-text] is much easier to understand than text B [= NV-text]."
b. "I see that text A [= NV-text] is written is a simpler way than text B [= V-text]."

Nonetheless, 41 out of 99 students were able to accurately describe one or more types of voice elements, as illustrated for instances of "you" in (10), for questions in (11), and for exclamations and evaluations in (12).

(10)

a. "In text A [= V-text] he/she is talking to you and in the other he/she isn't."
b. "One is you and the other is someone else. So you → 'you think', and someone else → 'many people think'."
c. "I think it's more for you, because in text B [= V-text] there is 'you'."

(11)

a. "In text B [= V-text] more questions are asked and I get more involved."
b. "In one text they ask you something and in the other they just tell it."

c. "In text A [= V-text] they ask questions and give answers. In text B [= NV-text] they tell it all in one time."

(12)

a. "One of them has punctation, then it just is more fun, without it it's boring."
b. "In text B [= V-text] the first sentence is a question. In text B [= V-text] there also are many question marks and exclamation marks."
c. "In the A texts [= V-texts] there are more things with ! signs and ? signs and extra sentences, like 'that's a shame' or 'that's fun'."

*3.5 Exploratory analyses based on task 3*

Task 3 demonstrates that almost half of all students were able to mention relevant differences between V- and NV-texts (notice, $N$=41), while the other half were not (no notice, $N$=58). We explored whether this distinction affected students' appreciation, hypothesizing that "notice" students were more likely to prefer one text variant over the other, because they were able to distinguish between the two text variants. Conversely, we expected that "no notice" students were less likely to show clear text preferences, because they were not able to mention relevant differences between the two text variants. However, this is not precisely what our additional analyses showed.

*Task 1 – free choice.* An additional linear interaction model that included the fixed factors Voice (voice vs. no voice), Notice (notice vs. no notice), and their interaction, as well as the random factors Participant and Topic was found to be the best fitting model (Model 3: $\chi^2(1)=6.95$, $p=.008$). Counterintuitively, a post hoc Tukey analysis showed that while "no notice" students appreciated V-texts more than NV-texts ($p=.021$), "notice" students did not have a clear text preference ($p=.727$).

*Task 2 – forced choice.* For all three appreciation statements, we performed an additional general loglinear analysis, in which models including the fixed factors Voice (voice vs. no voice vs. no preference) and Notice (notice vs. no notice), and/or their interaction, were selected via a step-down procedure. For "nicest to read", the final model retained the fixed factors Voice ($\chi^2(2)=18.16$, $p<.001$) and Notice ($\chi^2(1)=4.95$, $p=.026$), but not their interaction ($\chi^2(2)=2.02$, $p=.364$). The lack of an interaction effect and the presence of the main effect of Voice indicate that the majority of students in both groups showed a similar preference for the V-text for this statement (i.e., more students with a preference for the V-text than for the NV-text: $z=2.66$, $p=.008$; or without a preference: $z=4.02$, $p<.001$). In other words, they followed the overall pattern reported in Section 3.3.

For "most clearly written", the final model retained all effects ($\chi^2(0)=0.00$, $p=1.00$), indicating that the interaction between Voice and Notice was significant ($\chi^2(2)=6.67$, $p=.036$), on top of the main effects for Voice ($\chi^2(2)=7.55$, $p=.023$) and Notice ($\chi^2(1)=4.95$, $p=.026$). It was established that while students who were able to mention relevant differences between V-texts and NV-texts did not differ in their preference for these text variants in terms of clarity ($z=0.73$, $p=.464$), their "no notice" peers more often considered the V-text most clearly written than the NV-text ($z=2.04$, $p=.042$). There was no difference between the groups for "no preference" ($z=-0.54$, $p=.590$): in both groups, more students considered the V-text most clearly written than the number of students who did not make a choice for either text variant in this respect ($z=2.01$, $p=.044$).

For "addressing most directly", the final model also retained all effects ($\chi^2(0)=0.00$, $p=1.00$), indicating a significant interaction effect ($\chi^2(2)=18.63$, $p<.001$), on top of the main effects for Voice ($\chi^2(2)=42.85$, $p<.001$) and Notice ($\chi^2(1)=5.25$, $p=.022$). While "notice" students had a very strong preference for the V-text as the text that addressed them most directly (difference with NV-texts: $z=4.98$, $p<.001$; difference with no preference: $z=5.31$, $p<.001$), the preference of "no notice" students for the V-text was less pronounced (compared to "notice" students, for NV-texts: $z=-2.43$, $p=.015$; for no preference: $z=-3.71$, $p<.001$). Still, "no notice" students felt addressed more directly by the V-text than by the NV-text ($z=3.55$, $p<.001$). For each statement, Table 3 shows the number of students (and percentage) per voice-choice for "notice" and "no notice" students.

**Table 3.**
Number of students (and percentage) per choice per statement for "notice" and "no notice" students

| | Nicest to read | | | | Most clearly written | | | |
|---|---|---|---|---|---|---|---|---|
| | Notice (*N*=82) | | No notice (*N*=113) | | Notice (*N*=82) | | No notice (*N*=113) | |
| Voice | 43 | 52% | 49 | 43% | 30 | 37% | 50 | 44% |
| No voice | *24 | 29% | *35 | 31% | 36 | 44% | *30 | 27% |
| No preference | *15 | 18% | *29 | 26% | *16 | 19% | *33 | 29% |

| | Addressing most directly | | | |
|---|---|---|---|---|
| | Notice (*N*=82) | | No notice (*N*=114) | |
| Voice | 60 | 73% | 50 | 44% |
| No voice | *13 | 16% | *28 | 24% |
| No preference | *9 | 11% | 36 | 32% |

*$p<.05$

## 4. Discussion and conclusion

By means of an off-line reading experiment, we investigated Dutch students' appreciation of educational texts with and without voice elements. Our findings are summarized in Table 4. Table 4 does not distinguish between geography sub-domain, because – contrary to our expectations – students' preferences were not affected by this distinction: fifth graders did not appreciate voice elements more in physical geography texts than in human geography texts. Consequently, our distinction between the two sub-domains proved to be irrelevant.

**Table 4.**
Appreciation patterns for texts with (V) and without voice elements (NV)

| | Free choice | Forced choice | | |
|---|---|---|---|---|
| | | Nicest to read | Most clearly written | Addressing most directly |
| All students | V = NV | V > NV | V = NV | V > NV |
| Notice | V = NV | V > NV | V = NV | V > NV |
| No notice | V > NV | V > NV | V > NV | V > NV |

The overall appreciation pattern in Table 4, representing all students, indicates that while no differences in fifth graders' appreciation are established in a free choice task, these students predominantly prefer educational texts with voice elements over their non-voiced counterparts when they are urged to make a choice between the two.

Why does the overall pattern only show appreciation effects for the forced choice task? In the free choice task, students' text preferences were assessed without priming them for writing style differences. This task was selected because it best conforms to the regular Dutch educational practice, in which students read educational texts one by one (not comparing them) and are generally not made aware of differences in writing styles. The lack of an appreciation effect for this task suggests that at this point in the experiment students 1) did not notice any stylistic differences between the two text variants, and as a result, did not appreciate them differently, or 2) did notice stylistic differences, but nonetheless did not indicate a preference for either text variant.

The findings of the subsequent forced choice task demonstrate that students are sensitive to writing style differences: when urged to compare the two text variants, students predominantly preferred voice texts over non-voice texts. Why did they not indicate these preferences earlier on? An explanation might be that the forced choice task provided students with a more narrowed focus while filling out the appreciation statements, as it prompted students to critically consider both text variants. By contrast, in the free choice task, students evaluated texts in isolation. Not exactly knowing what to focus on and having been unable to obtain clues from the task in this respect, students may have taken other factors into account besides stylistic

differences while evaluating the texts that were presented in this task, such as their background knowledge and/or topic interest. In addition, even if students did focus primarily on stylistic differences in this task, it might still have been difficult for them to evaluate such differences, as they read each experimental text in isolation and were not allowed to look back into previously read texts. As such, how could they have estimated where on a continuum of writing styles ranging from fully expository to fully personal each of these texts was located? On reflection, this seems a rather difficult task, and even though this task more closely resembles the regular Dutch educational practice than a forced choice task, it might not have been the most suitable task to ask students to perform.

The free choice task, however, does tell us that fifth graders might not be so susceptible to small textual interventions (yet), when they are not pointed into the right direction. If students by themselves are indeed not that receptive to voice elements, it would be difficult to translate this into applicable design principles for educational publishers, because it would immediately generate a practical issue: there would not be enough time in a lesson and space in an educational textbook to accommodate two variants of every educational text in order to reach beneficial appreciation effects (cf. Chapter 6 – Sangers et al., submitted B). Nevertheless, students' predominant preference for voice texts in the forced choice task indicates that students do have certain preferences. It is plausible that such preferences are still present in the background when students are not consciously considering them, and as such, these latent preferences may still positively contribute to students' text comprehension. In addition, the overall appreciation pattern indicates that voice elements were never found to lead to negative appreciation effects. Accordingly, based on students' text appreciation, there seems to be no reason for Dutch educational publishers to exclude voice elements from their texts. The overall appreciation pattern thus supports Dutch publishers' assumption that the inclusion of voice elements in educational texts makes these texts more interesting for students to read (cf. Chapter 6 – Sangers et al., submitted B).

Nonetheless, the overall appreciation pattern was not the complete harvest of our experiment. In addition to the free and forced choice task, in the final task, we asked students to write down as many differences as they had noticed between the two text variants they had read for the forced choice task. This way, we established that 41 out of 99 students were able to mention relevant differences between educational texts with and without voice elements (notice), while the other 58 students were not (no notice). As the distinction between "notice" and "no notice" students was made in retrospect, we cannot tell with certainty if "notice" students already sensed stylistic differences during the two first tasks of our experiment, and attuned their preferences accordingly. Instead, it could have been the case that they only did so when asked to write these differences down in the final task. Similarly, we cannot know for certain if "no notice" students did sense some variation between the two text variants, but

were merely not able to put them into words, or whether they were completely insensitive to voice elements. We thus need to be cautious while interpreting the findings of our exploratory analyses.

The two lower rows of Table 4 show that while "notice" students' preferences follow the overall appreciation pattern, those of "no notice" students diverge from this pattern in two respects, suggesting that students' text preferences are affected by their language sensitivity/proficiency. In contrast to the overall pattern, "no notice" students were found to demonstrate clear text preferences for all appreciation statements – even in the free choice task –, while we hypothesized that these students would be less likely to show such preferences, as they seemed oblivious to relevant differences between educational texts with and without voice elements. Therefore, the question is: why are these students' preferences so clear, all pointing in the same direction (V>NV)? We can only speculate about the explanation. For instance, one explanation for these findings might be that "no notice" students, who we assume to be less sensitive to or even less proficient in language, were slightly intimidated by the fully expository NV-text – even though they were not able to describe concrete difference between this text and the V-text is. As such, these students may have subconsciously chosen the V-texts over the NV-texts, because voice elements tend to somewhat "relieve" the expository nature of educational texts.

Future research is needed to find out whether our speculative explanatory findings can be replicated, and how they are to be explained: does students' sensitivity to and proficiency in language indeed influence their preferences regarding educational texts with and without voice elements? And where on the continuum ranging from fully expository (no voice elements) to fully personal (many voice elements) should an educational text be located if we want at least some students to recognize differences between voice and non-voice text variants? A minimal use of voice elements, or different types of voice elements, in educational texts might not suffice to reach appreciation effects, even in a forced choice task. And to what extent does a text's location on the continuum influence students' preferences? Do students prefer some voice elements over others? And does it matter if the author asks students one question or multiple ones? Ideally, research into such matters includes a much larger sample of students, as well as a more accurate distinction, pre-selected on the basis of the hypotheses, between students who do and do not notice relevant stylistic differences.

In addition, in future research, it would be interesting to look into the effects of other vividness-increasing strategies in enhancing the attractiveness of educational texts, such as narrative elements (cf. Chapter 2 and 4 – Sangers et al., 2020, 2021). With respect to narrative elements, previous empirical research has found no appreciation differences between narrative and expository educational texts (cf. Cervetti et al., 2009; Eng, 2002; Kim, 2017; Romero et al., 2005; van Silfhout, 2014; Wolfe & Mienko, 2007; Wolfe & Woodwyk, 2010). However, as these studies

have operationalized the narrative genre in so many different ways in their experimental texts, at present no firm conclusions can be drawn about the relative effectiveness of narrative elements in educational texts (Chapter 3 – Sangers et al., 2019). Hence, we are in need of additional empirical research that more consistently manipulates the narrative genre.

Finally, we need consistent empirical research that investigates the precise effects of vividness-increasing strategies on text comprehension. While the findings of our study support Dutch publishers' assumption that voice elements make educational texts more interesting to read (cf. Chapter 6 – Sangers et al., submitted B), it is yet to be determined to what extent these elements also lead to enhanced text comprehension. Although the literature generally assumes a straightforward positive relation between text appreciation and text comprehension (cf. Beck et al., 1995; Brozo et al., 2007; Guthrie & Wigfield, 2000; Hidi, 2001; Sadoski, 2001; Schraw & Lehman, 2001), some studies suggest that text appreciation might not be a necessary component in this respect (e.g., Land, 2009; van Silfhout, 2014). Hence, it would be particularly valuable if future studies could shed light upon the mediating role of text appreciation in eventual text comprehension, especially with respect to the use of vivid elements in educational texts.

Taken together, the results of this study have shown that even though fifth graders do not always demonstrate clear-cut appreciation preferences with respect to educational texts with and without voice elements, it is the voice text that prevails when they do. As voice elements were never found to lead to negative appreciation effects, when it comes to students' text appreciation there seems to be no reason for educational publishers to exclude these elements from their texts. The findings of this study thus support the assumption presented by Dutch educational publishers that voice elements make educational texts more interesting to read (cf. Chapter 6 – Sangers et al., submitted B).

# Chapter 8
## General discussion and conclusion

Educational textbooks play an essential role in the transfer of knowledge in present-day Dutch primary and secondary education classrooms (Woldhuis et al., 2018). In order to acquire the to-be-learned information represented in educational textbooks, students need to be able to properly understand the texts these books include. However, it is not self-evident that students adequately understand their educational texts: many Dutch students consider their educational texts too boring to read and/or too difficult to understand (Dood et al., 2020; Gubbels et al., 2017; Gubbels et al., 2019; Inspectorate of Education, 2017, 2020, 2021).

As text comprehension is the result of complex interactions between characteristics of the reader (e.g., decoding skills, background knowledge), the task (e.g., reading purpose), and the text (e.g., content, form, style), its optimization can be approached in more than one way (Snow, 2002; White, 2010). This dissertation focused on the characteristics of educational texts, investigating two types of elements that have been argued to make these texts more vivid, thereby enhancing students' engagement and text comprehension: narrative and voice elements.

The main purpose of this dissertation was to carefully 1) define narrative and voice elements within the boundaries of the educational domain (WHAT), 2) investigate their application in current Dutch educational textbooks (HOW), and 3) find out the rationales behind the use of these elements (WHY). In this final chapter, we first summarize the main findings of this dissertation (Section 1). Subsequently, we reflect on remaining issues as well as suggest directions for future research, formulating issues that such research should take into consideration (Section 2). We conclude this chapter with practical implications for educational publishers (Section 3).

### 1. Overview of main findings

*1.1 WHAT: defining narrative and voice elements in educational texts*

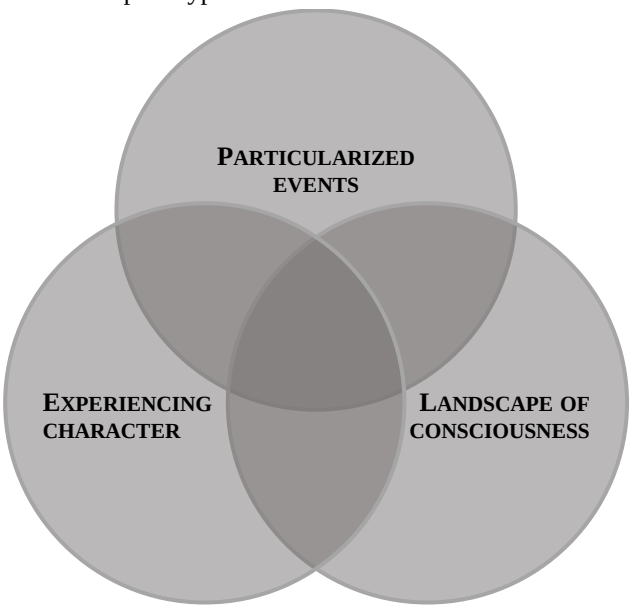
The first aim of this dissertation was to define narrative and voice elements within the context of the educational domain, and find out how these elements are applied in Dutch educational texts. In Chapter 2, we adopted Nisbett and Ross' (1980) conceptual notion of vividness to characterize narrativity and voice in educational texts. Nisbett and Ross (1980) define vivid texts as texts that aim to attract and hold readers' attention and excite their imagination to the extent that the content is "1) emotionally interesting, 2) concrete and imagery-provoking, and 3) proximate in a sensory, temporal, or spatial way" (p. 45), arguing that the more vivid a text is – that is, the more of these dimensions are present in the text –, the more likely its content

is to be stored and remembered. We reasoned that narrative elements are associated with the first two dimensions of vividness, as narrative texts tend to be emotionally interesting, use concrete language, and excite readers' imagination. In addition, we argued that voice elements relate to the proximity dimension of vividness, as these elements facilitate a "here and now" interaction between the author of an educational text and students, thereby decreasing the distance between students and the text's content. As such, we posited the use of narrative and voice elements as strategies to enhance the level of vividness in educational texts.

Subsequently, we connected both vividness-increasing strategies to specific textual characteristics of Dutch educational texts. Based on narratological definitions, notably Toolan's (2001), we characterized narrative educational texts as exhibiting three prototypical narrative elements: 1) a sequence of non-randomly connected particularized events, that are 2) experienced by a specific character, of whom 3) readers gain insight into the inner world.

To visualize the fluid ways in which narrative elements are combined in Dutch educational texts, we created an analytical model in the form of a Venn diagram, as presented in Figure 1. In this figure, each circle represents a prototypical narrative element. In addition, the intersections represent the different combinations of narrative elements that can be found in Dutch educational texts. As Figure 1 shows, less-pronounced narrative texts evolve around prototypical "full" narratives, which are classified in the center of the diagram.

**Figure 1.**
Different combinations of prototypical narrative elements in the educational domain



We defined voice elements as textual elements that make an educational text "speak" to students, imitating a direct interaction between these students and the author of the text, the so-called "voice" (cf. Beck et al., 1995). We demonstrated that voice elements surface in various ways in Dutch educational texts, including the use of "you" and "we", questions, evaluations, imperatives, and exclamations.

The inclusion of narrative and voice elements in educational texts is assumed to enhance students' engagement and text comprehension. However, it is unknown what the precise effects of these vivid elements are. While voice elements have not yet been extensively researched within the educational domain, empirical research on the effectiveness of narrative elements in educational texts shows conflicting results: some studies report that narrative elements contribute positively to the comprehension and recall of educational content (e.g., Eng, 2002; Romero et al., 2005), while other studies indicate negative outcomes (e.g., Cervetti et al., 2009; van Silfhout, 2014). As these conflicting results might be caused by divergence in experimental text manipulations, we aimed to gain insight into the ways in which the narrative and expository genre were operationalized in previous empirical research into narrativity in the educational domain.

To this end, in Chapter 3, we analyzed to what extent 26 experimental texts from seven studies – identified by the original researchers as either narrative or expository – contain the three prototypical narrative elements that were defined in Chapter 2. In all selected studies, the narrative and expository counterparts conveyed the same educational content.

Text analyses showed that most narrative experimental texts contain all three prototypical narrative elements, and therefore, are to be categorized as full narratives. Unexpectedly, however, half of the expository texts were also found to include one or more prototypical narrative elements. This indicates that not all texts that were labeled as "expository" by the original researchers are truly fully expository. Hence, previous empirical studies did not always reach a full manipulation distance, which we defined as the difference in number of prototypical narrative elements between narrative and expository counterparts.

Variation in manipulation distance, however, was not found to explain the conflicting results reported in the studies. For sets with a large manipulation distance genre effects were only occasionally found, and in opposite directions. Conversely, for sets with a smaller manipulation distance, genre effects were found – even when the manipulation distance was completely lacking. For these sets, the directions of the effects also varied.

In addition, no consistent patterns were found with respect to specific prototypical narrative elements, or combinations thereof. When genre effects pointed in the same direction, the combination of narrative elements differed. By contrast, when the same combination of narrative elements was used, the resulting genre effects were not the same.

In the selected studies, only one consistent pattern was found, namely an overall lack of genre effects on text appreciation. This suggests that in the educational domain students may not appreciate narrative elements as much as is generally assumed, which would take away one of the fundamental reasons to incorporate these elements in educational texts. However, due to the significant variation in the genre manipulations used in the selected studies, no firm conclusions can yet be drawn about the relative effectiveness of narrative elements in educational texts.

To prevent future incomparability of empirical results due to too much divergence in text manipulations, and instead base new research on actual educational practices, the aim of this dissertation was not only to accurately define narrativity and voice in the educational domain, but also to chart the use of narrative and voice elements in current Dutch educational textbooks.

*1.2 HOW: charting narrative and voice elements in educational texts*

To gain insight into the use of narrative and voice elements in present-day Dutch educational texts, we conducted two quantitative corpus-based analyses: one focused on narrative elements (Chapter 4) and one focused on voice elements (Chapter 5). For both analyses, we compiled a corpus of biology, geography, and history texts for grade 5 (Dutch *groep 7*) and for grade 8 (pre-university track, *Dutch* vwo 2). The narrative corpus consisted of 999 educational texts; the voice corpus contained 1055 educational texts, with an overlap of 980 educational texts between the two corpora.

We hypothesized that the extent to which Dutch educational publishers incorporate narrative and voice elements in their texts would be influenced by the nature of the to-be-learned information, which differs between the school subjects biology, geography, and history. While specific events, specific people, and their experiences are often at the core of history texts, biology and geography texts tend to focus on recurrent natural phenomena and/or general processes, without human involvement or with humans only being passively involved. Based on these differences in focus, we hypothesized that prototypical narrative elements would be more frequent in history texts than in biology and geography texts (Chapter 4). By contrast, we hypothesized that voice elements would be incorporated more often in biology and geography texts compared to history texts (Chapter 5). That is, while historical figures often enable identification in history texts, and their presence can help students to view the educational content from different perspectives, making the to-be-learned information better imaginable and relatable (cf. Bartelds et al., 2020; Hidi, 2001; Kuijpers, 2014), such mediators are generally absent in biology and geography texts. Hence, in the latter texts, students need to exert more effort to relate the educational content to their own world. Therefore, we expected that the author of the educational text would extend a helping hand in these texts by acting as an

alternative mediator in bringing the educational content in closer proximity to the students (cf. Nolen, 1995).

In both corpus-based analyses, we divided the school subject geography into the sub-domains physical geography – with a focus on natural phenomena – and human geography – with a focus on human-related phenomena, as we expected variation in the use of narrative and voice elements based on the inherent involvement of humans in the educational content. Taken together, the hypothesized distribution of narrative and voice elements over texts for different school subjects was as follows:

| | |
|---|---|
| NARRATIVE ELEMENTS: | history > human geography > physical geography = biology |
| VOICE ELEMENTS: | history < human geography < physical geography = biology |

In addition, we investigated whether potential differences in the use of narrative and voice elements over school subjects are generalizable over grade levels, focusing on texts for grade 5 and grade 8.

The corpus-based analyses revealed that narrative and voice elements are quite common in Dutch educational texts: 45 percent of the texts in the narrative corpus contained one up to three of the prototypical narrative elements defined in Chapter 2 (*N*=453). An experiencing character was most frequently found (*N*=293, 29%), closely followed by a particularized event (*N*=282, 28%) and a landscape of consciousness (*N*=253, 25%). For all different combinations of prototypical narrative elements represented in Figure 1, matching educational texts were found. In texts that combined two prototypical narrative elements, the combination of a particularized event and an experiencing character was most common (*N*=87, 9%). More than 10 percent of the texts in the narrative corpus were categorized as full narratives, including all three prototypical narrative elements (*N*=114).

In addition, the analyses demonstrated that voice elements were present in more than 60 percent of the texts in the voice corpus (*N*=640). More than half of the texts exhibited one up to three different types of voice elements (*N*=608, 58%), while only a small number of texts contained four or more different types of voice elements (*N*=32, 3%). The most commonly found voice element was the pronoun “you” (*N*=451, 43%), followed by evaluations (*N*=153, 15%) and questions (*N*=149, 14%).

The corpus-based analyses showed that the use of narrative and voice elements in texts for history, human geography, physical geography, and biology largely followed the hypothesized patterns for school subjects. However, the distinction between human and physical geography texts was found to be irrelevant for both kinds of elements. Altogether, the distribution of narrative and voice elements over Dutch educational texts for different school subjects was found to be as follows:

| | |
|---|---|
| NARRATIVE ELEMENTS: | history > human geography = physical geography = biology |
| VOICE ELEMENTS: | history < human geography = physical geography = biology |

These patterns confirm that narrative and voice elements have a distinct role in educational texts for different school subjects: while prototypical narrative elements are generally at the heart of history texts, voice elements are more often incorporated in biology and geography texts.

The above patterns for school subjects were proven to be generalizable over grade levels, as generally no differences were found in the use of narrative and voice elements in texts for grade 5 and grade 8. This suggests that while Dutch educational publishers pursue deliberate strategies for the use of narrative and voice elements in texts for different school subjects, they do not formulate such strategies with respect to variation in the use of these elements over grade levels. Such conclusions, however, cannot be substantiated based on corpus-based research alone. Therefore, the third aim of this dissertation was to find out the rationales behind the use of narrative and voice elements in Dutch educational texts, focusing on Dutch educational publishers' opinions and policies concerning these elements.

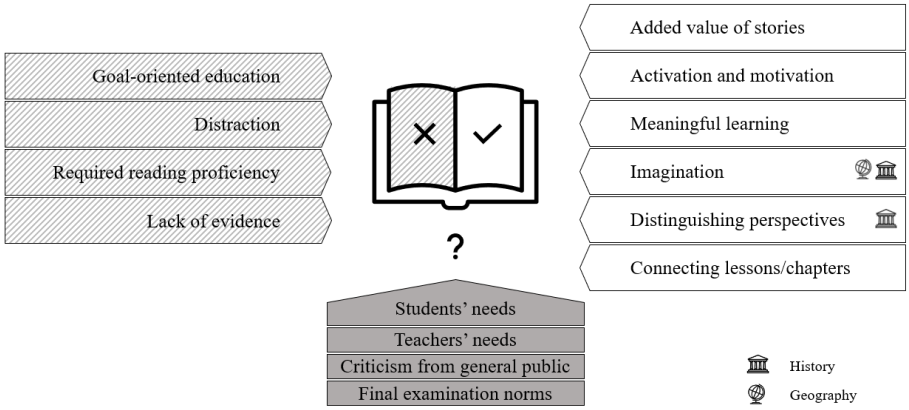
*1.3 WHY: rationales behind using narrative and voice elements in educational texts*

In the Netherlands, educational textbooks are developed by independent publishing companies that have considerable liberties to translate government-set curricular objectives into educational materials (Bisschop et al., 2016). Consequently, educational publishers play a critical role in the design of Dutch educational texts.

In Chapter 6, we gained insight into Dutch publishers' opinions and policies regarding the use of narrative and voice elements in educational texts by means of two focus groups and an interview with primary and secondary educational experts from five dominating educational publishing companies on the Dutch educational textbook market. The experts worked as editor(-in-chief), portfolio manager, content manager, and/or content developer. In all three sessions, the school subjects biology, geography, and history were each represented by at least one expert.

The three sessions revealed which advantages, disadvantages, and additional considerations educational experts take into account when deciding on the inclusion or exclusion of narrative and voice elements in their educational materials. These findings are summarized in Figure 2.

**Figure 2.**
Perceived advantages (blank), disadvantages (light grey), and additional considerations (dark grey) of using narrative and voice elements in educational texts




The advantages listed in Figure 2 confirm the presumed rationale that Dutch educational publishers use narrative and voice elements as strategies to make their educational texts more engaging for students to read (cf. activation and motivation) and easier to understand and learn (cf. meaningful learning). The list of disadvantages, however, demonstrates that the use of narrative and voice elements in educational texts is not without its limitations. One major limitation the experts mentioned is that due to highly goal-oriented education, they consider the use of narrative elements at odds with the transfer of the actual educational content, which they find the most essential part of educational textbooks.

The experts argued that the extent to which they ultimately use narrative and voice elements in their educational texts – weighing both the advantages and disadvantages – is dependent on the school subject. While they value narrative elements most in history texts, especially because these elements are assumed to stimulate students to imagine themselves in another time period and help them to critically distinguish between historical perspectives (cf. Houwen et al., 2020; Kropman et al., 2019, 2020), the experts consider narrative elements less imperative in biology and geography texts. Alternatively, in these latter texts, the experts prefer the use of voice elements.

These preferences perfectly align with publishers' actual practice, as was charted for narrative elements in Chapter 4 and for voice elements in Chapter 5. Hence, the findings of Chapter 6 confirm what the corpus-based results already suggested: Dutch educational publishers pursue deliberate strategies when it comes to the use of narrative and voice elements in texts for different school subjects.

The findings of Chapter 6 also substantiate the presumption that Dutch educational publishers do not formulate deliberate strategies with respect to the use of

narrative and voice elements in texts for different grade levels. That is, the general lack of differentiation in the use of narrative and voice elements over texts for grade 5 and grade 8, as was established in the corpus-based analyses of Chapter 4 and Chapter 5, is reflected in a lack of strong preferences and policies shared in the focus groups, as the experts stated that they never attune the use of narrative and voice elements between the primary and secondary education departments within their publishing company.

Besides the advantages and disadvantages presented in Figure 2, the experts take the needs of students and teachers into account. While they do not hesitate to include narrative elements in their texts when it comes to teachers' desire "to tell stories", the experts are slightly hesitant to use these elements when it comes to their effectiveness on students' comprehension and learning processes. According to the experts, positive empirical evidence is generally lacking in this respect. In light of the findings of Chapter 3, this hesitance is understandable, and emphasizes the need for more systematic empirical research.

Even though the experts wish to see their perceived advantages supported by empirical research, they seem quite convinced that narrative and voice elements make educational texts more interesting for students to read, and as a result, easier to understand and learn. As for effects on text comprehension and learning, however, it remains unknown whether Dutch students truly prefer educational texts with narrative and/or voice elements over texts without these elements. In fact, for narrative elements, the overall lack of genre effects for text appreciation found in Chapter 3 suggests that students may not appreciate texts with narrative elements more than texts without them. If narrative and voice elements do not enhance students' text appreciation, this would eliminate one of the fundamental reasons to include these elements in educational texts.

Therefore, in Chapter 7, we investigated the validity of publishers' assumption about the attractiveness of vivid educational texts by means of an off-line reading experiment with Dutch fifth graders ($N$=99, 46 girls), focusing on their appreciation of educational texts with and without voice elements. The findings indicated that even though fifth graders do not always demonstrate clear-cut appreciation preferences with respect to educational texts with and without voice elements, it is the voice text that prevails when they do. As voice elements were never found to lead to negative appreciation effects, based on students' text appreciation there seems to be no reason for Dutch educational publishers to exclude these elements from their texts. The findings of Chapter 7 thus support Dutch educational publishers' rationale that the use of voice elements in educational texts makes these texts more interesting for students to read.

## 2. Revisiting the WHAT, HOW, and WHY

All main chapters in this dissertation enclosed a discussion section that reflected on unanswered questions and limitations of the used approaches, suggesting directions for future research. In this section, we revisit some of these aspects, as well as highlight new ones, sketching a perspective of the what, how, and why of using narrative and voice elements in educational texts that transcends that of individual chapters.

### *2.1 WHAT: generalizability of definitions*

In this dissertation, we have posited the use of narrative and voice elements as vividness-increasing strategies, and defined specific textual characteristics of these strategies in Dutch educational texts (see Section 1.1). How generalizable are these definitions in relation to other functional domains?

The three prototypical narrative elements seem to be relevant for defining narrative prototypes in functional domains other than the educational domain. The application of these elements, however, is likely to depend on the purpose with which texts are used within a certain context. This purpose may differ from functional domain to functional domain. For instance, while the ultimate goal of educational texts is to transfer knowledge to students, the purpose of journalistic texts is to accurately inform readers about ongoing events. Within the domain of journalism, narrative elements are used to make newsworthy information more vivid. News narratives have been argued to attract and maintain readers' attention better than traditional news reports, and have been claimed to give readers the experience of what it must have been like to be present at the reported events, inviting them to become "mediated witnesses" (van Krieken et al., 2015a, 2015b; van Krieken & Sanders, 2016; Peelo, 2006). Making news reports more vivid by using narrative elements, however, does not allow journalists to veer away from the truth of the events they report about: they need to adhere to the "objectivity norm" (cf. Schudson, 2001; van Krieken et al., 2015b). While fictitious events are an option in narrative educational texts, such events are inadmissible in news narratives. Similarly, news narratives do not allow for the inclusion of fictitious characters, but instead need to refer to real sources in the form of actual eyewitnesses, professionals, and/or victims. Furthermore, landscapes of consciousness of eyewitnesses/professionals/victims should reflect what these people actually expressed, and not be embroidered or construed by journalists themselves.

Contrary to journalistic texts, and similar to educational ones, fictitious events, fictitious characters, and fictitious landscapes of consciousness are – to a certain extent – allowed in health texts. In the domain of health communication, narrative texts are used with the purpose of persuasion, for instance to promote positive health actions or convince patients to take a particular medical treatment (cf. de Graaf et al., 2016). Again, this purpose seems to affect the exact use of the three prototypical

narrative elements. While events in educational texts generally concentrate on historical situations (history texts) or recurring processes (biology and geography texts), those in health texts tend to target the (hypothetical) future, particularly focusing on these events' (potential) negative and/or positive outcomes on readers' health. This focus is intended to persuade readers to take certain health actions. Similar to the representation of students' peers in educational texts, characters in health texts regularly represent peers as fellow sufferers to enable identification, which can be used as a mediating mechanism of narrative persuasion (cf. de Graaf et al., 2012; Hoeken et al., 2016). In addition, while educational publishers' focus on conveying actual educational content restricts the textual space for elaborated landscapes of consciousness in educational texts, such elaborations in health texts – describing the thoughts, beliefs, feelings, and/or sensory perceptions of fellow sufferers – can help to touch the right chord in convincing readers to take certain health actions.

The voice elements we defined within the educational domain also seem to be relevant in other functional domains. In these domains, however, it seems not so much the application of specific voice elements that differs, but rather the "voice" expressing these elements. For instance, while voice elements in educational texts are expressed by the educational author, voice elements in online brand communication are put into words by customer services employees. As these employees make use of "you", "we", questions, imperatives, evaluations, and exclamations in online messages to communicate with their consumers, these six types of voice elements directly fit into the concept of "conversational human voice", which is described as "an engaging and natural style of organizational communication perceived by an organization's publics based on interactions between individuals in the organization and individuals in publics" (Kelleher, 2009, p. 177). However, compared to the use voice of elements in the educational domain, conversational human voice in online brand communication encompasses additional textual elements, such as well-wishing and personal signatures at the end of online messages. Hence, the definition of voice appears to be more comprehensive in the domain of online brand communication.

In sum, our specific textual characterizations of narrativity and voice for the educational domain appear to be largely generalizable to other functional domains. Nevertheless, between functional domains, there are some nuances in the application of the three prototypical narrative elements as well as in the number of elements included in the concept of voice. Such nuances *between* different functional domains do not seem to be so problematic. What is most essential is that researchers adhere to the same definitions *within* each of these functional domains. Up to now, this has not invariably been the case: significant variation in text manipulations used in empirical research is not only found within the educational domain (see Section 1.1), but also within the domains of health communication (cf. Dahlstrom et al., 2017; de Graaf et al., 2016; Hinyard & Kreuter, 2007) and online brand communication (cf. Brouwer

& den Ouden, 2018; Liebrecht et al., 2021). This lack of shared understanding of narrativity and voice generates challenges when attempting to synthesize the findings of empirical studies and examine the ultimate impact of narrative and voice elements within a certain functional domain.

To be able to draw firm conclusions about the relative effectiveness of narrative and voice elements within a functional domain, researchers need to adopt one and the same definition of narrativity as well as voice, or at least be explicit about their choices, and manipulate their experimental texts accordingly. Of course, empirical studies can never be all-embracing: many different studies are needed to solve the effectiveness puzzle, examining different narrative and/or voice elements, and combinations thereof, as well as different dependent variables, tasks, target groups, school subjects, and so forth. However, to be able to solve the puzzle in its entirety, it is crucial that empirical studies focus on different parts of the *same* puzzle, and not on different parts of *different* puzzles.

In this light, it is important that researchers clearly spell out their used definitions in their publications, as well as give insight into the ways in which they have operationalized these definitions in their studies. Within all functional domains, it is imperative that researchers are transparent about their research, and that they openly share the scientific information concerned with it, such as experimental materials, data, code, publications, and software.[1] The aims of making research practices more transparent and scientific results better accessible are brought together in the movement of Open Science (Nosek et al., 2015; Spellman et al., 2017). Open Science enables knowledge sharing without constraints, as well as allows for accurate verification of previous scientific findings (cf. Eerland & van den Bergh, 2016). As such, Open Science does not only enhance the possibility of solving the ultimate narrative/voice effectiveness puzzle, but also promotes the spreading of its outcomes into the hands of as many as possible – within and beyond the research practice.

Furthermore, in every functional domain, researchers should ideally base their interpretations of narrativity and voice on actual practices within this domain. Only then empirical results will be ecologically valid, leading to implications that are relevant to the actual practice of the domain. The current dissertation has provided the necessary ingredients for future empirical breakthroughs regarding the effectiveness of narrativity and voice in the educational domain. Researchers in this domain can take this dissertation as a reference point for future empirical research (see Section 2.2 and Section 2.3). In addition, researchers in functional domains other than the educational domain can take this dissertation as a model to more clearly define and chart narrative and voice elements within their domain. First precisely delimiting one's field of research will contribute to relevant and valuable empirical

[1] The analytical instruments and reusable data concerning the research reported in this dissertation will be made available via the DANS EASY repository at https://easy.dans.knaw.nl/.

research, which will lead to comparable and interpretable research results that contribute to solving the ultimate effectiveness puzzle.

*2.2 HOW: variation in the level of vividness in educational texts*

Subsequent to defining narrativity and voice within the boundaries of the educational domain, we have charted the use of narrative and voice elements in Dutch educational texts. Even though our corpus-based analyses have shown that narrative and voice elements are used strategically differently in these texts depending on the school subject (see Section 1.2), this does not entail that both vividness-increasing strategies are mutually exclusive.

The two strategies are, for instance, fruitfully combined in the geography text in (1). In this text, the author asks students to imagine themselves having a friend in Chile. This invitation allows students to enter a narrative world, in which they receive an email from this Chilean friend. The invitation does not only bring the educational content in closer proximity to students, but also prompts sensory imagery of this content. In addition, the educational content becomes more emotionally interesting, as students get to play an active role in the narrative world. As such, the combination of narrative and voice elements in (1) brings together the three dimensions of vividness (cf. Nisbett & Ross, 1980).

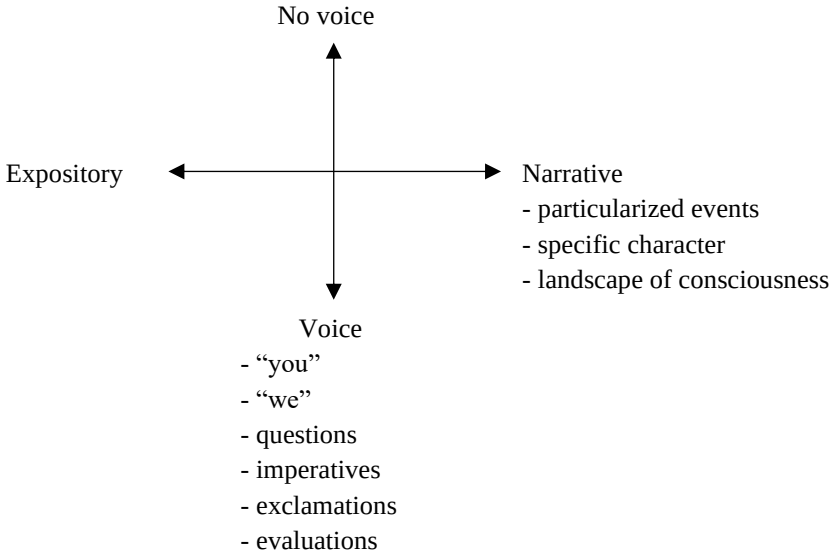
(1) Imagine you have a friend in Chile. On 1 July, you receive an email from him: "Is it snowing at your place too? I'm wearing my winter coat!" Snow in July: how is that possible? It has everything to do with the tilt of the earth. Thanks to this tilt we have seasons. During our summer, the northern hemisphere is tilted towards the sun. Therefore, this part of the earth is closer to the sun. As a result, it is nice and warm here! However, the southern hemisphere, where Chile is located, is much further away from the sun at that moment. What season is it there, do you think? And what kind of weather is associated with it?

(*Argus Clou Aardrijkskunde*, geography grade 5, p. 11)

It remains unknown, however, whether such a combination of narrative and voice elements makes an educational text even more vivid than the separate use of these strategies, or whether an optimum in the level of vividness of educational texts is already reached when either narrative or voice elements are used to their full extent. Figure 3 illustrates how narrative and voice elements can be combined into a continuum of vivid elements, consisting of two intersecting scales: one scale ranging from fully expository educational texts, exhibiting no narrativity, to fully narrative educational texts, containing all three prototypical narrative elements (narrative scale), and one scale ranging from educational texts without voice elements to educational texts that include these elements (voice scale). The closer an educational

text is to the narrative or voice extreme of the continuum, the more vivid this text is argued to be.

**Figure 3.**
A continuum of vivid elements in educational texts




In between the two extremes of the narrative scale are hybrid forms of narrativity, containing one or two prototypical narrative elements. Although it is likely that hybrid forms that combine two prototypical narrative elements are located further on the right side of the narrative scale than hybrid forms that merely contain one element, it remains to be determined as to how hybrid forms of narrativity precisely relate to each other, as it is still unknown whether the three prototypical narrative elements are equally significant in their realization of vividness in educational texts.

The same holds for the voice scale: which voice elements, or combinations thereof, result in the most vivid educational texts? In comparison to the narrative extreme, the voice extreme is harder to define: "more" voice does not necessarily involve the inclusion of all six types of voice elements, but can also be reached by the inclusion of more instances of specific types of these elements (e.g., one question vs. five questions). Hence, the different types of voice elements cannot only be combined in many ways, but can also each be applied in varying degrees.

Now that we have defined the textual characterizations of narrativity and voice in educational texts, a next step is to investigate which narrative and/or voice elements, as well as combinations and elaborations thereof, make educational texts more and most vivid. A way to empirically examine this is to find out how these

elements are perceived by students: do students consider educational texts with two prototypical narrative elements indeed more vivid than those that include only one element? And what is the contribution of the different types of voice elements to the eventual level of vividness in educational texts? By presenting students with varying text manipulations, one could find out to what extent different narrative and/or voice elements, or combinations and/or elaborations thereof, lead to different outcomes for the perceived sense of vividness. Such empirical research would allow for a more accurate positioning of educational texts on the continuum in Figure 3, as well as show whether educational texts that combine both narrative and voice elements are indeed more vivid than those that contain only one of these vividness-increasing strategies.

Once the perceived level of vividness in educational texts is determined for the different narrative and/or voice elements, or combinations and/or elaborations thereof, subsequent steps are to investigate how the level of vividness affects students' reading and learning processes. For instance, it is yet unclear whether an optimal level of vividness in educational texts also leads to the optimal enhancement of students' engagement and text comprehension, or whether the level of vividness has some alternative mediating role in this respect.

### *2.3 WHY: effectiveness of vivid elements in educational texts*

We are in need of consistent empirical research that examines not only the effects of narrative and voice elements on students' engagement (see Section 1.3), but also educational publishers' assumption that enhanced engagement results in students' enhanced comprehension of educational texts. Although a positive relation between engagement and text comprehension is broadly supported in the literature (cf. Beck et al., 1995; Brozo et al., 2007; Guthrie & Wigfield, 2000; Hidi, 2001; Sadoski, 2001; Schraw & Lehman, 2001), there are also studies that suggest that the relation between the two might not be as strong. For instance, Land (2009) discovered that although Dutch students in pre-vocational education preferred educational texts with vivid elements over their non-vivid counterparts, they performed better on comprehension tasks after reading the latter texts.

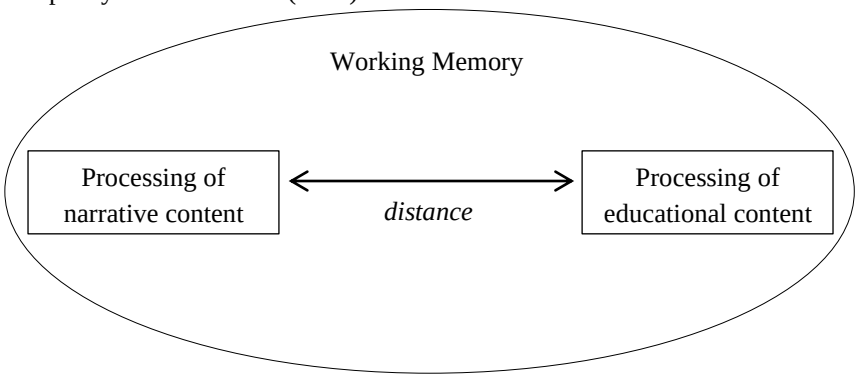
In addition, while van Silfhout (2014) did not find any differences in Dutch pre-vocational education students' appreciation of expository and fictional narrative educational texts, these students were found to better comprehend expository texts. As established in Chapter 3, however, there was no full manipulation distance between van Silfhout's (2014) experimental texts, as both the narrative texts and the expository texts featured two or more prototypical narrative elements. This raises the question as to how "expository" the expository texts of this empirical study truly were, and to what extent the narrative elements in these expository texts actually mediated the enhanced comprehension effect that van Silfhout (2014) found. Would the outcome have been different if no narrative elements had been present in the expository texts? If so, this study might not have provided evidence against a

straightforward relation between students' engagement and their text comprehension. More consistent future research is needed to determine the precise role of students' engagement in their eventual text comprehension, especially with respect to the use of narrative and voice elements in educational texts.

Furthermore, as the fundamental goal of educational texts is to accurately convey educational content, we particularly need new empirical research to investigate the ultimate effectiveness of narrative and voice elements on students' comprehension of educational texts: are these vivid elements truly beneficial in achieving optimal understanding and learning, as some previous empirical studies suggest (cf. Beck et al., 1995; Eng, 2002; Romero et al., 2005)? Or do they lead to detrimental effects, as implied by other empirical studies (cf. Cervetti et al., 2009; van Silfhout, 2014)? And what factors mediate the effects these elements bring about? Besides the level of vividness, additional text-internal factors are likely to play a role in the effectiveness of narrative and voice elements on students' comprehension of educational texts. Some of these potential influencing factors closely link to the notion of "distance", which can be operationalized in educational texts in various ways. In what follows, we discuss two such operationalizations.

One operationalization of distance in educational texts can be found in the relatedness between narrative/voice elements and the educational content. The capacity model of Fisch (2000), which was originally developed to account for the allocation of children's limited working memory resources while watching narrative educational television (e.g., Sesame Street), describes that the extent to which children are able to adequately process both the narrative content and the educational content of these TV-programs is affected by the distance between the two, as illustrated in Figure 4.

**Figure 4.**
The capacity model of Fisch (2000)



In the capacity model, distance is defined in terms of relatedness: if the narrative content is integral to the educational content, the distance between the two is small. Conversely, if the narrative and educational content are tangential, the distance between the two is large. While a small distance between the narrative and educational content is predicted to result in children's enhanced comprehension of the educational content, a large distance is assumed to cause children's cognitive resources to compete between the processing of both types of content. Due to a bias towards the processing of the narrative content, this competition is predicted to result in children's impaired comprehension of the educational content (cf. Piotrowski, 2014). The capacity model thus asserts that adding narrative content to educational content is only helpful for learning if the two are closely related. As such, the capacity model is linked to theories of "seductive details", which argue that too much attention for interesting but unimportant narrative information shifts away students' attention from the actual educational content they need to learn (i.e., there is a large distance), thereby leading to unintended effects (cf. Garner et al., 1989; Harp & Mayer, 1998).

The capacity model's way of operationalizing distance seems relevant in the context of educational texts as well. In the corpus-based analysis of Chapter 4, we observed that while specific events, specific people, and their experiences are often at the heart of the to-be-learned information in history texts, educational textbooks also include history texts that contain narrative elements that do not relate one-on-one to the educational content. For instance, in the history text in (2), the fictitious character Pieter tells about his experiences as a merchant. Although this text sketches the life of a "common man" in the fifteenth century, it does not directly relate to the educational content of the lesson this text is presented in, which is about voyages of discovery and overseas trade routes. Consequently, in (2), the distance between the narrative content and the educational content seems to be larger than that in history texts that show a stronger relation between the two. For instance, the history text in (3) – presented in a lesson about the most significant TV-moments of the 1960s – describes the specific events that led to the unfortunate death of the well-known historical figure John F. Kennedy. As the specific events, the specific character, and the experiences represented in this text are integral to the educational content (i.e., these narrative elements are precisely the information students need to learn), the distance between the narrative content and the educational content seems to be small by definition.

(2) I am Pieter Ysenbouts from Antwerp. I buy and sell spices from the East: nutmeg, pepper, cloves, cinnamon... The commercial ships bring me everything. Maybe I will travel on a such a ship myself soon.
(*Tijdzaken*, history grade 5, p. 77)

(3) In the United States, a young, handsome president came to power in 1960: John F. Kennedy. He had big plans for his country. The world was shocked when Kennedy was murdered in 1963. He was shot dead while driving through the city of Dallas in his open top car. The images of the murder were shown on television.

(*Eigentijds*, history grade 5, p. 50)

Based on the capacity model's predictions about the relatedness between the narrative content and the educational content, we would expect that the narrative elements in (2) do not positively contribute to students' comprehension of the educational content (large distance), while those in (3) have no detrimental effect in this respect (small distance).[2] It would be worthwhile to examine to what extent such predictions hold true. Are less-related narrative elements indeed less beneficial to learning than more-related narrative elements? And hence, do less-related narrative elements need to be classified as "seductive details"? Recent research suggests that the unintended effects of seductive details on learning may not be as large as is often anticipated based on previous research (cf. contributions in Eitel & Kühl, 2019). For instance, students' level of arousal as well as explicitly instructing them about the irrelevance of seductive details was found to prevent the unintended effects of these elements on learning (cf. Eitel et al., 2019; Schneider et al., 2019). What perspectives does this offer for less- and more-related narrative elements in educational texts? Could the hypothesized unfavorable effects of less-related narrative elements, for instance, be moderated by the increased level of vividness these elements bring about? Or would it help to point out to students that texts like (2) are meant as a way to give them a better impression of the historical time period they are learning about, and that such texts do not belong to the core of the to-be-learned information? Even though educational publishers are concerned that less-related narrative elements may distract students from the actual content they need to learn, publishers also value these elements because they are assumed to stimulate students to picture themselves in another time period as well as help them to critically distinguish between historical perspectives (cf. Chapter 6; Houwen et al., 2020; Kropman et al., 2019, 2020). Which of these assumed effects has the upper hand? It would be fruitful for educational publishers if future research could provide them with evidence-based criteria in this respect.

Answers to the above-formulated questions are relevant not only for history texts, but also in relation to texts for other content-area subjects, such as biology and

[2] Note that we are operationalizing distance here purely in terms of content. Another way of operationalizing distance can be found in the relatedness between narrative/voice elements and students, as discussed below. Differences between (2) and (3) on the basis of this latter operationalization are left out of consideration here.

geography. The corpus-based analysis in Chapter 4 indicated that narrative elements are generally not at the center of the educational content of these subjects, and that educational publishers instead occasionally use narrative-like strategies to make biology and geography texts more concrete and imaginable, such as the addition of fictitious characters. Such deliberate narrative interventions seem to automatically induce a certain degree of distance, as they are not integral to the educational content. If a large distance between the narrative and educational content is indeed proven to result in negative learning effects for educational texts, then educational publishers could rather consider using alternative vividness-increasing strategies in biology and geography texts, such as the incorporation of voice elements. As the corpus-based analysis in Chapter 5 indicated and the focus group findings of Chapter 6 confirmed, this is in fact what currently generally happens in these contexts.[3]

We should, however, not dismiss the use of narrative elements in educational texts all at once. As distance is a scalar notion, there will likely be some distinction between the effectiveness of narrative elements that do not at all connect to the educational content and those that are merely not integral to this content. For example, the narrative biology text in (4), which was created by Wolfe and Mienko (2007), tells a story about a young man, Alex, who travels through the blood vessels of a woman. As such, the human body's blood circulation is explained. However, the context of Alex' story is completely unrealistic, and does not map one-on-one to the educational content, as one body's blood circulation is normally not travelled through by other human beings. By contrast, in the biology text in (5), information about the pollination of flowers is told from the perspective of forester Jan. Even though Jan is not integral to this educational content, his profession as a forester does not make him completely irrelevant in this context either. In addition, the narrative intervention in (5) is rather subtle in comparison to that in (4).

(4) Alex worked for many years on a machine that would allow him to become tiny. One day, he finally finished the machine and made himself tiny. He was so light that he could fly. When passing by a woman, Alex got sucked into her lungs. He held on to an oxygen molecule that had also entered the lungs. The molecule was absorbed into a red blood cell in the blood. He wanted to find a way back outside.

(Wolfe & Mienko, 2007, *Alex' adventure*)

[3] What may also play a role here is that it is less easy to incorporate narrative elements in biology and geography texts than in history texts due to the fact that in the first texts these elements often put an extra layer on top of the educational content as they are not integral to it.

(5) An entomophilous flower needs insects for its pollination. A windflower uses the wind. "Windflowers don't need to be noticeable to insects. That's why they look different", says forester Jan. "They have long stamens and large pistils. Those hang down from the flowers. As long as the wind can get to them, that's the most important thing."

(*Argus Clou Natuur en Techniek*, biology grade 5, p. 49)

Given that super-unrealistic narrative contexts, such as that in (4), are not found in Dutch educational textbooks (cf. Chapter 4), we consider it more appropriate to examine the effectiveness of narrative interventions in texts like (5), which was part of the narrative corpus. The biology text in (5) could, for instance, be contrasted with a text variant that includes the same educational content but leaves out narrative character Jan. Testing such experimental texts is more ecologically valid, because it uses the types of educational texts that feature in the present-day Dutch educational practice. Hence, such a study would lead to more relevant evidence-based criteria for Dutch educational publishers than a study that focuses on texts with unrealistic contexts like (4).

So far, we have operationalized distance in terms of the relatedness between narrative/voice elements and the educational content. A second way to operationalize distance in educational texts can be found in the relatedness between narrative/voice elements and students. This operationalization links to the proximity dimension from Nisbett and Ross' (1980) definition of vividness, which distinguishes between three proximity aspects: temporal proximity, spatial proximity, and sensory proximity (cf. Chapter 2).[4] The idea behind this dimension is that the more closely an educational text is related to students as intended readers with respect to these three aspects (i.e., the smaller the distance), the more vivid this text is assumed to be, which is in turn predicted to result in enhanced learning outcomes (cf. Nisbett & Ross, 1980). While we have previously connected the proximity dimension primarily to voice elements, it is also relevant for the use of narrative elements in educational texts.[5]

Both narrative and voice elements can, for instance, bring the educational content in closer proximity to students in time. For example, in (6), the educational author relates to-be-learned information about people's way of dressing in the past to the students way of doing so in the "now". This connection to students' present it assumed to make the educational content easier for students to relate to.

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[4] Although it seems rather difficult to reach sensory proximity in educational texts, such proximity could be achieved in lab lessons (e.g., by letting students see, smell, hear, touch, and/or taste something related to the educational content).

[5] Nisbett and Ross (1980) also argue that proximity may be mediated partially by the other two dimensions of vividness – emotional interest and concrete/imagery-provoking –, which we have primarily associated with narrative elements.

(6) Do you prefer your clothes to look nice over them being comfortable? People used to consider their clothes mainly important for protecting their bodies against the weather or against scratches of branches. This means that clothes had to be robust and warm.

(*Wijzer! Geschiedenis*, history grade 5, p. 16)

To achieve a similar connection to the "here and now" by using narrative elements, van Silfhout (2014) created an experimental history text that conveyed to-be-learned information about the Dutch historical painter Rembrandt by considering it from a contemporary setting, as illustrated in (7). Note that van Silfhout (2014) also included a narrative character in this setting who she made highly identifiable for students, namely the Dutch teenager Daan.

(7) "Hey dad, we didn't go to the Rijksmuseum during spring break, because it was still being renovated. But now it is open again. Why don't we go today?", the fourteen-year-old Daan asked his father. (…) His father was enthusiastic straight away: "Let's go there together. The Night Watch by Rembrandt van Rijn is world famous."

(van Silfhout, 2014, *Rembrandt-NF*)

Although van Silfhout (2014) expected that the contemporary setting and the narrative character Daan would help students to more closely relate to the educational content, the narrative text in (7) did not result in students' enhanced text comprehension compared to textual counterparts that were told from a historical perspective. An explanation for this finding may be sought in the operationalization of distance that we discussed above (i.e., the capacity model): by placing the educational content of (7) in a contemporary setting, the distance not only decreased in terms of temporal proximity and narrative character identification, it also increased with respect to the relatedness between the narrative and educational content, due to the fact that this intervention created an extra story layer that was irrelevant to the educational content. As such, the narrative and educational content in (7) may have been too tangential to induce positive learning effects. Future research should determine how temporal proximity and narrative character identification can be manipulated in such a way that they do not negatively affect the relatedness between the narrative and educational content.

In addition to temporal proximity, narrative and voice elements can also bring the educational content in closer spatial proximity to students. For instance, in (1), repeated here as (8), the author of the text compares the weather conditions on the other side of the world (Chile, far away) to those in the Netherlands (close by). Although such interventions are assumed to make the educational content more personally relatable for students, it remains to be determined to what extent they can

positively mediate students' text comprehension, and how this pertains to the relatedness between the narrative and educational content.

> (8) Imagine you have a friend in Chile. On 1 July, you receive an email from him: "Is it snowing at your place too? I'm wearing my winter coat!" Snow in July: how is that possible? It has everything to do with the tilt of the earth. Thanks to this tilt we have seasons. During our summer, the northern hemisphere is tilted towards the sun. Therefore, this part of the earth is closer to the sun. As a result, it is nice and warm here! However, the southern hemisphere, where Chile is located, is much further away from the sun at that moment. What season is it there, do you think? And what kind of weather is associated with it?
>
> (*Argus Clou Aardrijkskunde*, geography grade 5, p. 11)

In bringing the educational content in closer proximity to students, educational publishers consider it particularly important that these elements are recognizable for *all* students (cf. Chapter 6). As an educational publisher rightly pointed out during one of the focus group sessions: if "you describe a family that goes on a holiday by air (…) and not a single student has the experience of flying, then your example is completely off the mark (…) then you have a class looking at you like: I have never flown, I know it exists, but… In that case, it suddenly becomes a lot more difficult to interact with that target group." However, it also seems relevant that narrative/voice elements are not too general or obvious: "then we all come up with the same example". In this light, it would be valuable for educational publishers to learn more about the extent to which recognizability as well as proximity mediate text comprehension: do students need to have personal experience with what is being depicted in the educational text? Or does it suffice for students to be able to form an image of it based on other people's experiences in order to relate to the educational content ("I have never flown" vs. "I know it exists")? In addition, it would be worthwhile to discover what the effects are of narrative/voice interventions that are so general that they are applicable to anyone.

Altogether, the two operationalizations of distance that were discussed in this section have provided relevant directions for future research. It would be valuable to find out how these two operationalizations can be optimally manipulated with respect to the use of narrative and voice elements in educational texts. Based on the above discussion, we would predict that vivid educational texts are most effective if they make use of narrative and/or voice elements that are 1) well related to the educational content, and 2) recognizable for and proximate to all students. Future research is needed to further our understanding in these respects, both theoretically and empirically.

## 3. Practical implications for educational publishers

Our collaboration with Dutch educational publishers has allowed for a fruitful exchange of thoughts between research and practice on the use of narrative and voice elements in educational texts. Unquestionably, the publishers have given us a valuable peek behind the scenes of the design process of educational texts, providing us insight into the advantages, disadvantages, and other considerations they take into account when deciding on the inclusion or exclusion of narrative and voice elements in their materials. In turn, we hope that our focus group sessions have made publishers more attentive to the promise of using narrative and voice elements in designing optimal educational texts. Based on our positive experiences, we would recommend more publisher-researcher collaborations in the future.

During our focus group sessions, we were pleased to find out that many publishers were on top of the Dutch literature on the effectiveness of narrative and voice elements in educational texts, and that they take the findings of empirical studies into account during their decision making. We would, however, recommend publishers to also keep an eye out for international publications on this and other topics that deal with the optimization of educational texts, as such publications will allow for more varied and refined pictures.

Despite having some knowledge about Dutch empirical studies, we also observed that publishers' opinions and policies are strongly influenced by the intuitions of teachers. As these do not always match empirical findings, we realize that future steps need to be taken to bridge this research-practice gap (cf. Pereira & Nicolaas, 2019). Although teacher-researcher collaborations would be beneficial in this respect, we also believe that publishers could take a mediating role here. Instead of adapting design practices to teachers' desires, we would advise publishers to stick to their chosen policies and take an active role in informing teachers about these policies in case of mismatches or misconceptions.

Finally, the focus group sessions have led to two additional observations that give food for thought. One observation is that the use of narrative and voice elements in educational texts was said to never be attuned between the primary and secondary education departments within a publishing company, which was indeed confirmed by the lack of differentiation in the use of these elements over texts for grade 5 and for grade 8 (see Section 1.2). Judging by the predominant perception in the literature that educational texts should ideally reflect a progression from relatively simple to more challenging texts in the course of a school career (cf. Brabham & Villaume, 2002; Shanahan et al., 2012; Snow, 2002) and by the assumed ability of narrative and voice elements to facilitate this, the lack of differentiation seems to be a lost opportunity. Accordingly, it might be a good idea if publishers from different departments were to drop into each other's offices to exchanges opinions and policies.

Another observation is the fundamental debate on the role of reading proficiency in biology, geography, and history lessons that our focus group sessions exposed: while some publishers argue that the focus of these school subjects should fully be on knowledge transfer and not on increasing reading proficiency, other publishers consider reading "highly important" in any school subject, arguing that it should always be part of the curriculum of biology, geography, and history lessons. We agree with this latter view, believing that the significance of reading on knowledge transfer can never be overlooked. While international studies have already shown that reading and science education can fruitfully be combined (cf. Bradbury, 2014), it is currently being investigated how this can be applied in the Dutch context and how appropriate present-day Dutch science texts are in this respect (cf. Kooiker-den Boer et al., submitted).

We consider it of the utmost importance that students are provided with the right tools as well as adequate amount of practice to learn how to properly read and understand the educational content of biology, geography, and history texts – especially considering the fact that this content is gradually becoming more abstract and less related to students' personal experiences (cf. Allington, 2002; Bogaert et al., 2008; Chambliss, 2002; Graesser et al., 2002; Jansma et al., 2011; Lapp et al., 2007; Lee & Spratley, 2010; Schleppegrell, 2004; Snow, 2002). We believe that narrative and voice elements have the potential to be a valuable means in this respect, and hope that future empirical findings will support this belief, providing decisive answers.

## 4. Conclusion

In this dissertation, we have defined narrative and voice elements within the boundaries of the educational domain, charted their application in current Dutch educational textbooks, and determined the rationales behind the use of these elements. By doing so, this dissertation has laid the foundation for solid future empirical research into the effectiveness of narrative and voice elements in educational texts. Such continued research is essential to further our understanding of using vividness-increasing strategies in the educational domain and study the promise of narrative and voice elements for designing optimal educational texts. After all, it is hard to overestimate the importance of well-designed educational texts that provide relevant educational content in an attractive and comprehensible way.

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# Appendix A Dutch educational textbook sources

**Biology**

*Grade 5*

Ottenheim, M., & Tromp, R. (Eds.) (2011). *Natuniek: Natuur en Techniek voor het basisonderwijs groep 7 leerlingenboek.* ThiemeMeulenhoff.

Talsma, A., & Vogelesang, L. (Eds.) (n.d.). *Natuurzaken: Werkboek jaargroep 7* (4th ed.). Uitgeverij Zwijsen.

Siemensma, F. (2014). *Wijzer! Natuur & Techniek: Leerwerkboek groep 7*. Noordhoff Uitgevers.

van Riel, M., & Soet, L. (Eds.). (2012). *Argus Clou professor in alles: Natuur en Techniek groep 7 lesboek*. Malmberg.

Wiechers, C. (Ed.) (2014). *Binnenstebuiten*: *Natuur en Techniek bronnenboek groep 7*. Blink Educatie.

*Grade 8*

Akkerman, T. (Ed.) (2013). *Nectar: 2-3 vwo leerboek* (4th ed.). Noordhoff Uitgevers.

Bos, A., Kalverda, O., Passier, R., Rawee, H., Smale, R., Smits, G., & Waas, B. (2015). *Biologie voor jou: Handboek 2a vwo/gymnasium* (7th ed.). Malmberg.

**Geography**

*Grade 5*

Bakker, A. (Ed.) (2012). *De blauwe planeet: Aardrijkskunde voor het basisonderwijs*. ThiemeMeulenhoff.

Huisman, A. (Ed.) (2012). *Argus Clou professor in alles: Aardrijkskunde groep 7 lesboek*. Malmberg.

Janssen, M. (Ed.) (2017). *Meander: Aardrijkskunde groep 7-8 – Leerwerkboek Bergen en dalen*. Malmberg.[1]

Siemensma, F. (2015). *Wijzer! Aardrijkskunde: Leerwerkboek groep 7*. Noordhoff Uitgevers.

Talsma, A. (Ed.) (2014). *Wereldzaken*: *Werkboek jaargroep 7* (3rd ed.). Uitgeverij Zwijsen.

van Ooijen, M. (Ed.) (2014). *Grenzeloos: Aardrijkskunde bronnengroep groep 7*. Blink Educatie.

[1] Excerpts from the textbooks *Meander* and/or *Brandaan* were used as examples in Chapter 2, Chapter 3, Chapter 4, and Chapter 6. However, these textbooks were not included in the corpus-based analyses of Chapter 4 and Chapter 5.

*Grade 8*

Ariaens, D., ten Brinke, W., de Jong, C., & Padmos, J. H. A. (Eds.) (2016). *De Geo: Aardrijkskunde voor de onderbouw 2 vwo* (9th ed.). ThiemeMeulenhoff.

van den Berg, G. (Ed.) (2014). *BuiteNLand 2 vwo* (3rd ed.). Noordhoff Uitgevers.

van de Ven, M. (Ed.) (2018). *De wereld van: Aardrijkskunde voor de onderbouw leeropdrachtenboek 2VG*. Malmberg.

**History**

*Grade 5*

Kroon, S. (Ed.) (2017). *Brandaan: Geschiedenis groep 7-8 – Leerwerkboek Boeren en farao's in Egypte*. Malmberg.[1]

Kruis, M. (2014). *Wijzer! Geschiedenis: Leerwerkboek Groep 7*. Noordhoff Uitgevers.

Können, A. (Ed.) (2012). *Argus Clou professor in alles: Geschiedenis groep 7 lesboek*. Malmberg.

Nijman, J., & Roest, H. (2011). *Speurtocht 7: Geschiedenis voor het basisonderwijs: Leerlingenboek* (2nd ed.). ThiemeMeulenhoff.

van de Mortel, M., van den Oever, M., Vermeer, H., & Vogelesang, L. (n.d.) *Tijdzaken: Werkboek jaargroep 7* (4th ed.). Uitgeverij Zwijsen.

Wiechers, C. (Ed.) (2014). *Eigentijds: Geschiedenis bronnenboek groep 7*. Blink Educatie.

*Grade 8*

Salemink, L., & Venner, J. (Eds.) (2010). *Feniks: Geschiedenis voor de onderbouw leesboek 2 vwo*. ThiemeMeulenhoff.

Schrover, W., & Tadema, J. (Eds.) (2015). *Memo: Geschiedenis voor de onderbouw 2 vwo handboek* (4th ed.). Malmberg.

van der Geugten, T., & Verkuil, D. (Eds.) (2013). *Geschiedenis werkplaats: 2 vwo informatieboek*. (2nd ed.). Noordhoff Uitgevers.

# Appendix B Statistical models for the narrative corpus (Chapter 4)

1. Generalized linear mixed models[1]

| **Full Venn** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 1112.7 | | | |
| *Model 1 (+SUBJECT) | 1069.1 | 43.56 | 3 | <.001 |
| Model 2 (+LEVEL) | 1068.9 | 0.21 | 1 | .645 |
| Model 3 (+SUBJECT:LEVEL) | 1067.7 | 1.19 | 3 | .755 |

| **Particularized event** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 990.7 | | | |
| *Model 1 (+SUBJECT) | 966.7 | 23.98 | 3 | <.001 |
| Model 2 (+LEVEL) | 966.7 | 0.04 | 1 | .844 |
| Model 3 (+SUBJECT:LEVEL) | 964.6 | 2.05 | 3 | .561 |

| **Experiencing character** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 862.5 | | | |
| *Model 1 (+SUBJECT) | 837.8 | 24.63 | 3 | <.001 |
| Model 2 (+LEVEL) | 837.7 | 0.17 | 1 | .68 |
| Model 3 (+SUBJECT:LEVEL) | 834.5 | 3.21 | 3 | .36 |

| **Landscape of consciousness** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 1014.2 | | | |
| *Model 1 (+SUBJECT) | 978.7 | 35.52 | 3 | <.001 |
| Model 2 (+LEVEL) | 978.2 | 0.53 | 1 | .468 |
| Model 3 (+SUBJECT:LEVEL) | 973.0 | 5.15 | 3 | .161 |

| **Full narrative** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 571.4 | | | |
| *Model 1 (+SUBJECT) | 534.3 | 32.05 | 3 | <.001 |
| Model 2 (+LEVEL) | 536.7 | 1.63 | 1 | .202 |
| Model 3 (+SUBJECT:LEVEL) | 532.1 | 4.58 | 3 | .205 |

| **Fictitious character** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 169.8 | | | |
| *Model 1 (+SUBJECT) | 149.4 | 20.38 | 3 | <.001 |
| Model 2 (+LEVEL) | 148.3 | 1.10 | 1 | .294 |
| Model 3 (+SUBJECT:LEVEL) | 141.2 | 7.08 | 3 | .069 |

[1] The Asterisk indicates the model that was proven to be the best fitting model.

| **Representative entity** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 770.2 | | | |
| Model 1 (+SUBJECT) | 718.7 | 51.52 | 3 | <.001 |
| Model 2 (+LEVEL) | 712.7 | 5.91 | 1 | .015 |
| *Model 3 (+SUBJECT:LEVEL) | 699.5 | 13.25 | 3 | .004 |

2. Predicted probability scores

| **Full Venn** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.23 | 0.05 | 0.13 | 0.36 |
| Geography – physical | 0.25 | 0.05 | 0.15 | 0.38 |
| Geography – human | 0.35 | 0.05 | 0.23 | 0.49 |
| History | 0.86 | 0.03 | 0.73 | 0.92 |

| **Particularized event** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.10 | 0.03 | 0.04 | 0.22 |
| Geography – physical | 0.15 | 0.04 | 0.07 | 0.29 |
| Geography – human | 0.15 | 0.04 | 0.07 | 0.28 |
| History | 0.62 | 0.07 | 0.44 | 0.77 |

| **Experiencing character** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.10 | 0.04 | 0.04 | 0.26 |
| Geography – physical | 0.10 | 0.04 | 0.04 | 0.24 |
| Geography – human | 0.08 | 0.03 | 0.03 | 0.21 |
| History | 0.70 | 0.08 | 0.47 | 0.85 |

| **Landscape of consciousness** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.13 | 0.03 | 0.08 | 0.22 |
| Geography – physical | 0.10 | 0.02 | 0.06 | 0.18 |
| Geography – human | 0.17 | 0.03 | 0.10 | 0.26 |
| History | 0.51 | 0.04 | 0.40 | 0.62 |

| **Full narrative** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.03 | 0.02 | 0.010 | 0.10 |
| Geography – physical | 0.03 | 0.01 | 0.009 | 0.09 |
| Geography – human | 0.01 | 0.01 | 0.001 | 0.04 |
| History | 0.31 | 0.06 | 0.186 | 0.47 |

| **Fictitious character** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.46 | 0.20 | 0.10 | 0.86 |
| Geography – physical | 0.64 | 0.18 | 0.21 | 0.92 |
| Geography – human | 0.91 | 0.09 | 0.44 | 0.99 |
| History | 0.02 | 0.02 | 0.003 | 0.13 |

| Representative entity | | Probability | SE | LCL | UCL |
|---|---|---|---|---|---|
| Grade 5 | Biology | 0.61 | 0.07 | 0.43 | 0.77 |
| | Geography – physical | 0.06 | 0.02 | 0.02 | 0.17 |
| | Geography – human | 0.08 | 0.03 | 0.03 | 0.20 |
| | History | 0.04 | 0.02 | 0.01 | 0.13 |
| Grade 8 | Biology | 0.82 | 0.06 | 0.58 | 0.93 |
| | Geography – physical | 0.29 | 0.07 | 0.14 | 0.52 |
| | Geography – human | 0.06 | 0.03 | 0.07 | 0.18 |
| | History | 0.04 | 0.02 | 0.01 | 0.13 |

3. Post hoc Tukey scores

BI = biology
GP = physical geography
GH = human geography
HI = history

5 = grade 5 (*Dutch* groep 7)
8 = grade 8 (pre-university track, *Dutch* vwo 2)

**Full Venn**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 0.89 | 0.32 | -0.33 | .988 |
| BI | / | GH | 0.56 | 0.20 | -1.66 | .343 |
| BI | / | HI | 0.05 | 0.02 | -8.16 | <.001 |
| GP | / | GH | 0.63 | 0.13 | -2.26 | .107 |
| GP | / | HI | 0.06 | 0.02 | -8.13 | <.001 |
| GH | / | HI | 0.09 | 0.03 | -6.94 | <.001 |

**Particularized event**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 0.63 | 0.31 | -0.94 | .784 |
| BI | / | GH | 0.65 | 0.32 | -0.89 | .812 |
| BI | / | HI | 0.07 | 0.03 | -5.56 | <.001 |
| GP | / | GH | 1.03 | 0.26 | 0.10 | 1.00 |
| GP | / | HI | 0.11 | 0.05 | -4.99 | <.001 |
| GH | / | HI | 0.11 | 0.05 | -5.06 | <.001 |

**Experiencing character**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 1.01 | 0.61 | 0.02 | 1.00 |
| BI | / | GH | 1.24 | 0.75 | 0.36 | .984 |
| BI | / | HI | 0.05 | 0.03 | -5.15 | <.001 |
| GP | / | GH | 1.23 | 0.36 | 0.72 | .891 |
| GP | / | HI | 0.05 | 0.03 | -5.34 | <.001 |
| GH | / | HI | 0.04 | 0.02 | -5.66 | <.001 |

**Landscape of consciousness**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 1.37 | 0.48 | 0.91 | .799 |
| BI | / | GH | 0.78 | 0.25 | -0.77 | .870 |
| BI | / | HI | 0.15 | 0.04 | -6.34 | <.001 |
| GP | / | GH | 0.57 | 0.16 | -2.07 | .163 |
| GP | / | HI | 0.11 | 0.03 | -7.20 | <.001 |
| GH | / | HI | 0.19 | 0.05 | -5.91 | <.001 |

**Full narrative**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 1.12 | 0.71 | 0.81 | .998 |
| BI | / | GH | 4.99 | 4.39 | 1.83 | .260 |
| BI | / | HI | 0.07 | 0.04 | -4.71 | <.001 |
| GP | / | GH | 4.45 | 3.56 | 1.87 | .241 |
| GP | / | HI | 0.07 | 0.04 | -5.08 | <.001 |
| GH | / | HI | 0.01 | 0.01 | -5.15 | <.001 |

**Fictitious character**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 0.47 | 0.52 | -0.68 | .906 |
| BI | / | GH | 0.09 | 0.11 | -1.89 | .232 |
| BI | / | HI | 39.48 | 45.35 | 3.20 | .008 |
| GP | / | GH | 0.18 | 0.17 | -1.80 | .274 |
| GP | / | HI | 84.03 | 90.09 | 4.13 | <.001 |
| GH | / | HI | 461.55 | 586.07 | 4.83 | <.001 |

**Representative entity**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| 5BI | / | 5GP | 23.10 | 11.63 | 6.25 | <.001 |
| 5BI | / | 5GH | 18.20 | 8.79 | 6.00 | <.001 |
| 5BI | / | 5HI | 37.40 | 20.56 | 6.59 | <.001 |
| 5GP | / | 5GH | 0.79 | 0.37 | -0.51 | 1.00 |
| 5GP | / | 5HI | 1.62 | 1.01 | 0.77 | .995 |
| 5GH | / | 5HI | 2.06 | 1.25 | 1.18 | .937 |
| 8BI | / | 8GP | 10.60 | 5.81 | 4.30 | <.001 |
| 8BI | / | 8GH | 71.10 | 45.27 | 6.70 | <.001 |
| 8BI | / | 8HI | 103.00 | 65.55 | 7.27 | <.001 |
| 8GP | / | 8GH | 6.72 | 2.99 | 4.28 | <.001 |
| 8GP | / | 8HI | 9.71 | 5.66 | 3.90 | .002 |
| 8GH | / | 8HI | 1.45 | 0.96 | 0.55 | .999 |
| 5BI | / | 8BI | 0.36 | 0.18 | -2.03 | .459 |
| 5GP | / | 8GP | 0.16 | 0.09 | -3.37 | .017 |
| 5GH | / | 8GH | 1.39 | 0.85 | 0.54 | 1.00 |
| 5HI | / | 8HI | 0.98 | 0.65 | -0.04 | 1.00 |

## Appendix C Statistical models for the voice corpus (Chapter 5)

1. Generalized linear mixed models[1]

| **Total** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 1368.3 | | | |
| *Model 1 (+SUBJECT) | 1346.5 | 21.83 | 3 | <.001 |
| Model 2 (+LEVEL) | 1343.1 | 3.35 | 1 | .067 |
| Model 3 (+SUBJECT:LEVEL) | 1339.3 | 3.78 | 3 | .029 |

| **Speech acts** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 1295.3 | | | |
| Model 1 (+SUBJECT) | 1285.3 | 9.04 | 1 | .029 |
| *Model 2 (+LEVEL) | 1276.8 | 8.58 | 3 | .003 |
| Model 3 (+SUBJECT:LEVEL) | 1274.9 | 1.83 | 1 | .609 |

| **Pronouns** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 1387.3 | | | |
| *Model 1 (+SUBJECT) | 1356.1 | 31.22 | 1 | <.001 |
| Model 2 (+LEVEL) | 1355.8 | 0.29 | 3 | .591 |
| Model 3 (+SUBJECT:LEVEL) | 1351.0 | 4.81 | 1 | .187 |

| **Questions** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| *Model 0 | 813.4 | | | |
| Model 1 (+SUBJECT) | 809.7 | 3.62 | 3 | .305 |
| Model 2 (+LEVEL) | 807.7 | 2.09 | 1 | .149 |
| Model 3 (+SUBJECT:LEVEL) | 805.4 | 2.21 | 3 | .530 |

| **Evaluations** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| *Model 0 | 852.8 | | | |
| Model 1 (+SUBJECT) | 847.2 | 5.52 | 3 | .138 |
| Model 2 (+LEVEL) | 846.8 | 0.46 | 1 | .500 |
| Model 3 (+SUBJECT:LEVEL) | 841.0 | 5.84 | 3 | .120 |

| **Imperatives** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 445.9 | | | |
| *Model 1 (+SUBJECT) | 426.4 | 19.49 | 3 | <.001 |
| Model 2 (+LEVEL) | 426.4 | 0.002 | 1 | .963 |
| Model 3 (+SUBJECT:LEVEL) | 425.3 | 1.14 | 3 | .767 |

| **Exclamations** | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 689.6 | | | |
| Model 1 (+SUBJECT) | 677.3 | 12.33 | 3 | .006 |
| *Model 2 (+LEVEL) | 658.4 | 18.91 | 1 | <.001 |
| Model 3 (+SUBJECT:LEVEL) | 656.3 | 2.11 | 3 | .550 |

[1] The Asterisk indicates the model that was proven to be the best fitting model.

| **You** | -2LL | $\Delta\chi^2$ | Δdf | p |
|---|---|---|---|---|
| Model 0 | 1342.3 | | | |
| *Model 1 (+SUBJECT) | 1314.8 | 27.46 | 3 | <.001 |
| Model 2 (+LEVEL) | 1314.7 | 0.12 | 1 | .729 |
| Model 3 (+SUBJECT:LEVEL) | 1311.1 | 3.55 | 3 | .315 |

| **We** | -2LL | $\Delta\chi^2$ | Δdf | p |
|---|---|---|---|---|
| Model 0 | 730.8 | | | |
| *Model 1 (+SUBJECT) | 721.6 | 9.23 | 3 | .026 |
| Model 2 (+LEVEL) | 720.0 | 1.59 | 1 | .208 |
| Model 3 (+SUBJECT:LEVEL) | 719.3 | 0.72 | 3 | .870 |

2. Predicted probability scores

| **Total** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.73 | 0.04 | 0.61 | 0.82 |
| Geography – physical | 0.72 | 0.04 | 0.60 | 0.81 |
| Geography – human | 0.64 | 0.05 | 0.51 | 0.75 |
| History | 0.40 | 0.05 | 0.29 | 0.53 |

| **Speech acts** | | Probability | SE | LCL | UCL |
|---|---|---|---|---|---|
| Grade 5 | Biology | 0.37 | 0.05 | 0.24 | 0.52 |
| | Geography – physical | 0.51 | 0.06 | 0.36 | 0.66 |
| | Geography – human | 0.44 | 0.06 | 0.30 | 0.59 |
| | History | 0.27 | 0.05 | 0.17 | 0.41 |
| Grade 8 | Biology | 0.21 | 0.05 | 0.11 | 0.37 |
| | Geography – physical | 0.33 | 0.05 | 0.20 | 0.49 |
| | Geography – human | 0.26 | 0.05 | 0.15 | 0.41 |
| | History | 0.15 | 0.03 | 0.08 | 0.26 |

| **Pronouns** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.65 | 0.05 | 0.52 | 0.76 |
| Geography – physical | 0.61 | 0.05 | 0.48 | 0.72 |
| Geography – human | 0.49 | 0.05 | 0.37 | 0.61 |
| History | 0.25 | 0.04 | 0.17 | 0.35 |

| **Imperatives** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.09 | 0.02 | 0.05 | 0.14 |
| Geography – physical | 0.08 | 0.02 | 0.05 | 0.13 |
| Geography – human | 0.04 | 0.01 | 0.02 | 0.08 |
| History | 0.01 | 0.01 | 0.003 | 0.03 |

| **Exclamations** | | Probability | SE | LCL | UCL |
|---|---|---|---|---|---|
| Grade 5 | Biology | 0.16 | 0.04 | 0.09 | 0.27 |
| | Geography – physical | 0.28 | 0.06 | 0.17 | 0.42 |
| | Geography – human | 0.13 | 0.04 | 0.07 | 0.23 |
| | History | 0.11 | 0.03 | 0.06 | 0.20 |
| Grade 8 | Biology | 0.02 | 0.01 | 0.01 | 0.06 |
| | Geography – physical | 0.05 | 0.02 | 0.02 | 0.10 |
| | Geography – human | 0.02 | 0.01 | 0.01 | 0.05 |
| | History | 0.02 | 0.01 | 0.01 | 0.04 |

| **You** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.59 | 0.06 | 0.48 | 0.70 |
| Geography – physical | 0.55 | 0.05 | 0.45 | 0.66 |
| Geography – human | 0.45 | 0.05 | 0.34 | 0.55 |
| History | 0.20 | 0.04 | 0.14 | 0.28 |

| **We** | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| Biology | 0.13 | 0.04 | 0.07 | 0.24 |
| Geography – physical | 0.15 | 0.04 | 0.08 | 0.25 |
| Geography – human | 0.08 | 0.03 | 0.04 | 0.16 |
| History | 0.05 | 0.02 | 0.02 | 0.11 |

3. Post hoc Tukey scores

BI = biology
GP = physical geography
GH = human geography
HI = history

5 = grade 5 (*Dutch* groep 7)
8 = grade 8 (pre-university track, *Dutch* vwo 2)

**Total**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 1.06 | 0.32 | 0.18 | .998 |
| BI | / | GH | 1.52 | 0.46 | 1.38 | .510 |
| BI | / | HI | 3.96 | 1.18 | 4.64 | <.001 |
| GP | / | GH | 1.44 | 0.28 | 1.91 | .226 |
| GP | / | HI | 3.75 | 1.09 | 4.56 | <.001 |
| GH | / | HI | 2.60 | 0.75 | 3.35 | .005 |

**Speech acts**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| 5BI | / | 5GP | 0.57 | 0.17 | -1.94 | .525 |
| 5BI | / | 5GH | 0.76 | 0.23 | -0.91 | .986 |
| 5BI | / | 5HI | 1.56 | 0.47 | 1.50 | .808 |
| 5GP | / | 5GH | 1.35 | 0.26 | 1.61 | .748 |
| 5GP | / | 5HI | 2.77 | 0.80 | 3.54 | .010 |
| 5GH | / | 5HI | 2.05 | 0.59 | 2.48 | .206 |
| 8BI | / | 8GP | 0.57 | 0.17 | -1.94 | .525 |
| 8BI | / | 8GH | 0.76 | 0.23 | -0.91 | .986 |
| 8BI | / | 8HI | 1.56 | 0.47 | 1.50 | .808 |
| 8GP | / | 8GH | 1.35 | 0.26 | 1.61 | .748 |
| 8GP | / | 8HI | 2.77 | 0.80 | 3.54 | .010 |
| 8GH | / | 8HI | 2.05 | 0.59 | 2.48 | .206 |
| 5BI | / | 8BI | 2.17 | 0.52 | 3.24 | .026 |
| 5GP | / | 8GP | 2.17 | 0.52 | 3.24 | .026 |
| 5GH | / | 8GH | 2.17 | 0.52 | 3.24 | .026 |
| 5HI | / | 8HI | 2.17 | 0.52 | 3.24 | .026 |

**Pronouns**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 1.20 | 0.35 | 0.62 | .927 |
| BI | / | GH | 1.95 | 0.57 | 2.31 | .097 |
| BI | / | HI | 5.65 | 1.65 | 5.92 | <.001 |
| GP | / | GH | 1.63 | 0.30 | 2.69 | .036 |
| GP | / | HI | 4.72 | 1.35 | 5.44 | <.001 |
| GH | / | HI | 2.89 | 0.82 | 3.74 | .001 |

**Imperatives**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 1.11 | 0.45 | 0.26 | .994 |
| BI | / | GH | 2.16 | 0.97 | 1.72 | .312 |
| BI | / | HI | 10.46 | 6.99 | 3.51 | .003 |
| GP | / | GH | 1.95 | 0.72 | 1.80 | .272 |
| GP | / | HI | 9.42 | 6.28 | 3.37 | .004 |
| GH | / | HI | 4.83 | 3.35 | 2.27 | .105 |

**Exclamations**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| 5BI | / | 5GP | 0.50 | 0.22 | -1.61 | .747 |
| 5BI | / | 5GH | 1.26 | 0.58 | 0.50 | 1.00 |
| 5BI | / | 5HI | 1.52 | 0.71 | 0.90 | .986 |
| 5GP | / | 5GH | 2.53 | 0.73 | 3.22 | .029 |
| 5GP | / | 5HI | 3.07 | 1.37 | 2.51 | .190 |
| 5GH | / | 5HI | 1.21 | 0.57 | 0.41 | 1.00 |
| 8BI | / | 8GP | 0.50 | 0.22 | -1.61 | .747 |
| 8BI | / | 8GH | 1.26 | 0.58 | 0.50 | 1.00 |
| 8BI | / | 8HI | 1.52 | 0.71 | 0.90 | .986 |
| 8GP | / | 8GH | 2.53 | 0.73 | 3.22 | .029 |
| 8GP | / | 8HI | 3.07 | 1.37 | 2.51 | .190 |
| 8GH | / | 8HI | 1.21 | 0.57 | 0.41 | 1.00 |
| 5BI | / | 8BI | 7.70 | 3.28 | 4.80 | <.001 |
| 5GP | / | 8GP | 7.70 | 3.28 | 4.80 | <.001 |
| 5GH | / | 8GH | 7.70 | 3.28 | 4.80 | <.001 |
| 5HI | / | 8HI | 7.70 | 3.28 | 4.80 | <.001 |

**You**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 1.18 | 0.38 | 0.51 | .956 |
| BI | / | GH | 1.81 | 0.58 | 1.87 | .242 |
| BI | / | HI | 5.85 | 1.91 | 5.41 | <.001 |
| GP | / | GH | 1.54 | 0.28 | 2.36 | .085 |
| GP | / | HI | 4.97 | 1.59 | 5.03 | <.001 |
| GH | / | HI | 3.23 | 1.03 | 3.68 | .001 |

**We**

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| BI | / | GP | 0.88 | 0.45 | -0.25 | .994 |
| BI | / | GH | 1.65 | 0.87 | 0.95 | .776 |
| BI | / | HI | 2.78 | 1.50 | 1.90 | .230 |
| GP | / | GH | 1.88 | 0.51 | 2.31 | .095 |
| GP | / | HI | 3.16 | 1.66 | 2.20 | .124 |
| GH | / | HI | 1.69 | 0.91 | 0.97 | .766 |

## Appendix D Focus groups: hand-out & questions (Chapter 6)

*Hand-out (translated from Dutch)*

**Educational texts with narrative elements**

Narrative elements in educational texts:

1. Particularized events
2. Experiencing character
3. Representation of inner world

Example texts:

1. Army commander Mauritius has trouble falling asleep. Tomorrow, he and his troops will be travelling to Gaul, to quell a rebellion. Mauritius approves of this plan. After all, the empire needs order and peace! However, the emperor has given an additional order: Mauritius has to kill all the Christians in the area. Mauritius is terribly shocked: he is a Christian himself, just like his soldiers. What should he do? The following days he cannot think of anything else. When they arrive in Gaul, he has made up his mind: Mauritius and his men refuse to kill the Christians. The emperor is furious about his disobedience and, as a punishment, gives the order to assassinate Mauritius and his soldiers. Many years later, the church decided to canonize Mauritius as a saint. People started to worship and depict him.

2.
    a. Hi, I am Tom. I am a pilot and make flights throughout Europe. I have seen a lot of Europe.
    b. When I fly over Europe, the landscape often shows me where I am.
    c. Do you know the mountains and waters of Europe?
    d. Europe has more than 50 countries.

3. The Indian Rajo Devi Lohan gave birth to a healthy daughter. Rajo and her husband had wished for a child for years, but it did not happen. That is why they decided to take an IVF treatment. With this treatment an egg cell and a sperm cell are brought together in a test tube. When they fuse, the fertilized egg is placed in the womb of the woman. This is how Rajo got pregnant. She is the eldest mother in the world. IVF is also used for young women who cannot have children any other way.

**Educational texts with voice elements**

Voice elements in educational texts:

1. Pronouns
    a. You
    b. We
2. Questions
3. Imperatives
4. References to personal environment
5. Exclamations
6. Evaluations

Fragmenten:

1. *What are you unable to see, smell or touch, but does exist? Air!* This invisible stuff is all around *us*. *You* cannot feel stationary air. Yet it takes up space. *Just blow* through a straw in a glass of lemonade. What *you* see are bubbles with air. *And what about a balloon?* That is *really festive* with a lot of air in it.

2. *Did you know that everything you eat comes from plants? Just think of* strawberry jam and pasta, which is made of grain. Even when *you* eat meat, *you* actually eat plants. Because meat comes from a cow, for example. *And a cow eats plants!* Without plants, people and animals would have no food. There is *something special* going on with plants: they produce their own food. They do this in their leaves. Just like people and animals, plants are composed of very small living parts. *We* call them cells. *You* can compare them with *bricks that form a house together*.

3. *Imagine*: yesterday, *you* went out for shopping or a snack in the center. *You* went to the big shopping street in *your* hometown. *Didn't you?* The center is a place where many people meet. There also need to be many roads that lead there.

    *You* can turn any city or place into a center. *How can you do this? You* make the place important. Build a palace there, or let the government work there. Such a center is called a center of administration. People should be able to get there easily. Build roads and provide public transport. *And if people from abroad want to visit the center?* Then *you* need hotels. *What do you think: can your center do without an airport?*

*Questions*

**Opinions**

1. What is your opinion about the application of narrative and voice elements in educational texts? Good idea or not, and why?

2. What effect do you think these elements have on the text and on the reader? What do think are the advantages and disadvantages of using these elements?

3. What are your ideas regarding differentiation in the use of these elements, for example between school subjects and/or educational levels?

**Policies**

1. To what extent do you make overarching guidelines within the group of authors/the publishing company about the use of narrative and voice elements? Or is every author free to choose his/her own approach?
    a. Shared approach: What guidelines are formulated? Who is responsible for verifying the implementation of these guidelines?
    b. Own approach: Which narrative and voice elements do you recognize from your own practice/in your own writing style?

2. Some educational texts are fully narrative in nature (e.g., example text (1)). Who are the authors of these texts? Are they written by educational authors or are third parties hired to write them?

3. What difficulties do you encounter with respect to narrative and voice elements when developing educational materials? What kinds of considerations do you run into?

# Appendix E Voice experiment: experimental texts & distribution of topics and conditions over booklets (Chapter 7)

*Experimental texts*

A. De Europese Unie – *The European Union* (human geography, 137 words in Dutch version)

| Voice | No voice |
|---|---|
| Je hebt vast weleens van de Europese Unie gehoord. In de EU werken steeds meer Europese landen samen. Is dat al lang zo? Nee! Na de Tweede Wereldoorlog gingen ons land, België, Luxemburg, Duitsland, Frankrijk en Italië samenwerken. Al snel wilden er meer landen meedoen. Zo groeide de Europese Unie. Deze landen hebben allemaal hun eigen cultuur, tradities, nationale feestdagen en talen. Het motto van de EU is: 'In verscheidenheid verenigd.' Dat betekent: wij zijn allemaal anders, maar wij hebben één doel. Het doel van de Europese Unie is dat wij er allemaal in vrijheid en veiligheid kunnen leven. Maar wat heb jij nog meer aan die samenwerking? Eén voordeel merk je elke dag: de euro. Je kunt er in bijna alle lidstaten mee betalen. Handig als je chocola wilt kopen in België of stokbrood in Frankrijk! | Veel mensen hebben weleens van de Europese Unie gehoord. In de EU werken steeds meer Europese landen samen. Dat is nog niet zo lang zo. Na de Tweede Wereldoorlog gingen Nederland, België, Luxemburg, Duitsland, Frankrijk en Italië samenwerken. Al snel wilden er meer landen meedoen. Zo groeide de Europese Unie. Deze landen hebben allemaal hun eigen cultuur, tradities, nationale feestdagen en talen. Het motto van de EU is: 'In verscheidenheid verenigd.' Dat betekent: de landen zijn allemaal anders, maar ze hebben één doel. Het doel van de Europese Unie is dat alle Europeanen er in vrijheid en veiligheid kunnen leven. De samenwerking heeft een aantal voordelen. Eén voordeel is voor iedereen goed zichtbaar: de euro. In bijna alle lidstaten is de euro het betaalmiddel. Zo kan er gemakkelijk chocola worden gekocht in België of stokbrood in Frankrijk. |
| *You have probably heard of the European Union. In the EU, more and more European countries are working together. Has this been the case for a long time? No! After World War II, our country, Belgium, Luxembourg, Germany, France, and Italy started collaborating. Soon more countries wanted to join. This is how the European Union grew. These countries all have their own culture, traditions, national holidays, and languages. The motto of the EU is: 'United in diversity'. That means: we are all different, but we have one goal. The goal of the European Union is that we can all live in freedom and safety. But what else do you gain from this collaboration? One advantage you encounter every day: the euro. You can pay with it in almost all member states. Handy if you want to buy chocolate in Belgium or a baguette in France!* | *Many people have heard of the European Union. In the EU, more and more European countries are working together. This has not been the case for a long time. After the Second World War, the Netherlands, Belgium, Luxembourg, Germany, France and Italy started collaboration. Soon more countries wanted to join. This is how the European Union grew. These countries all have their own culture, traditions, national holidays, and languages. The motto of the EU is: 'United in diversity'. That means: the countries are all different, but they have one goal. The goal of the European Union is that all Europeans can live in freedom and safety. The collaboration has a number of advantages. One advantage is clearly visible to everyone: the euro. In almost all member states, the euro is the means of payment. This way it is easy to buy chocolate in Belgium or a baguette in France.* |

B. Emigreren naar het buitenland – *Emigration abroad* (human geography, 168 words in Dutch version)

| **Voice** | **No voice** |
|---|---|
| Lijkt het jou ook leuk als je zou mogen verhuizen naar een groter huis in dezelfde buurt? Je blijft op dezelfde school en je ziet jouw vrienden nog elke dag. Maar als jij naar een andere stad verhuist, dan weet je dat er wel veel verandert. Je gaat naar een andere school en komt in een buurt waar je nog niemand kent. Dat is best wennen. En dat is al helemaal zo, als je met jouw gezin naar bijvoorbeeld Dubai verhuist. Iemand die ons land verlaat om in het buitenland te gaan wonen, noemen we een emigrant. Jaarlijks verhuizen duizenden emigranten naar het buitenland omdat ze daar werk hebben gevonden of omdat de huizen er goedkoper zijn. Anderen emigreren omdat er meer ruimte is om een bedrijf te beginnen. Denk maar aan boeren. Emigreren kost veel geld en je moet afscheid nemen van je familie, vrienden en oude leven, terwijl je niet weet of het in dat nieuwe land zal bevallen. Denk dus goed na voor je emigreert! | Wanneer een gezin verhuist naar een groter huis in dezelfde buurt, verandert er niet zoveel. De kinderen blijven op dezelfde school en ze zien hun vrienden nog elke dag. Maar als een gezin naar een andere stad verhuist, dan verandert er wel veel. De kinderen gaan naar een andere school en komen in een buurt waar ze nog niemand kennen. Dat is best wennen. En dat is al helemaal zo, als het gezin naar bijvoorbeeld Dubai verhuist. Iemand die zijn of haar land verlaat om in het buitenland te gaan wonen, heet een emigrant. Jaarlijks verhuizen duizenden emigranten naar het buitenland omdat ze daar werk hebben gevonden of omdat de huizen er goedkoper zijn. Anderen, bijvoorbeeld boeren, emigreren omdat er meer ruimte is om een bedrijf te beginnen. Emigreren kost veel geld en emigranten moeten afscheid nemen van hun familie, vrienden en oude leven, terwijl ze niet weten of het in dat nieuwe land zal bevallen. Voor iemand emigreert, is er dus veel om over na te denken. |
| *Would you also like it if you could move to a bigger house in the same neighborhood? You would stay in the same school and you would still see your friends every day. But when you move to another city, you know that a lot does change. You have to go to a different school and you move to a neighborhood where you do not know anyone yet. That takes some getting used to. And that is even more so when you move with your family to, say, Dubai. We call someone who leaves our country to live abroad an emigrant. Every year thousands of emigrants move abroad because they have found work there or because the houses are cheaper. Others emigrate because there is more space to start a business. Just think of farmers. Emigrating costs a lot of money and you have to say goodbye to your family, friends, and old life, while you do not know whether you will like it in that new country. So think carefully before you emigrate!* | *When a family moves to a bigger house in the same neighborhood, not much changes. The children stay in the same school and they still see their friends every day. But when a family moves to another city, a lot does change. The children have to go to a different school and they move to a neighborhood where they do not know anyone yet. That takes some getting used to. And that is even more so when the family moves to, say, Dubai. Someone who leaves his or her country to live abroad is called an emigrant. Every year thousands of emigrants move abroad because they have found work there or because the houses are cheaper. Others, for example farmers, emigrate because there is more space to start a business. Emigrating costs a lot of money and emigrants have to say goodbye to their family, friends, and old life, while they do not know whether they will like it in that new country. So before someone emigrates, there is a lot to think about.* |

C. Bevolkingsspreiding – *Population distribution* (human geography, 151 words in Dutch version)

| Voice | No voice |
|---|---|
| Ben jij een stadsmens of houd je meer van rust en natuur? In steden wonen mensen dicht op elkaar. Denk maar aan het overvolle Amsterdam. Daar is de bevolkingsdichtheid groot. Veel grote steden liggen aan een rivier of kanaal. Vroeger werden producten namelijk vooral over water vervoerd. Ook nu nog moeten steden goed bereikbaar zijn, over water én over land. Je begrijpt dat steden daarom vaak in vlakke gebieden en dalen liggen. In de steden zijn veel voorzieningen, zoals ziekenhuizen, bibliotheken en winkels. En jouw favoriete ijssalon! Waarom zou je dan toch op het platteland willen wonen? Daar is de bevolkingsdichtheid veel kleiner. Mensen wonen er verspreid in dorpen. Het is er heerlijk rustig en schoon. Je hebt er alleen minder voorzieningen. Je mist er bijvoorbeeld een bioscoop of museum. De verdeling van mensen over een gebied noem je bevolkingsspreiding. Als overal ongeveer even veel mensen wonen, is de bevolkingsspreiding gelijkmatig. | Sommige mensen zijn een stadsmens, andere mensen houden juist meer van rust en natuur. In steden wonen mensen dicht op elkaar. Een voorbeeld is de drukke stad Amsterdam. Daar is de bevolkingsdichtheid groot. Veel grote steden liggen aan een rivier of kanaal. Vroeger werden producten namelijk vooral over water vervoerd. Ook nu nog moeten steden goed bereikbaar zijn, over water én over land. Daarom liggen steden ook vaak in vlakke gebieden en dalen. In de steden zijn veel voorzieningen, zoals ziekenhuizen, bibliotheken en winkels. En er zijn drukbezochte ijssalons. Toch zijn er ook mensen die op het platteland willen wonen. Daar is de bevolkingsdichtheid veel kleiner. Mensen wonen er verspreid in dorpen. Het is er rustiger en schoner. Er zijn wel minder voorzieningen. Er is bijvoorbeeld geen bioscoop of museum. De verdeling van mensen over een gebied wordt bevolkingsspreiding genoemd. Als overal ongeveer even veel mensen wonen, is de bevolkingsspreiding gelijkmatig. |
| *Are you an urbanite or do you prefer peace and nature? In cities people live close together. Just think of overcrowded Amsterdam. The population density is high there. Many large cities are situated along a river or canal. In the past, products were mainly transported by water. Even now cities must be easily accessible, both by water and by land. You understand that cities are therefore often located in flat areas and valleys. Cities have many facilities, such as hospitals, libraries, and stores. And your favorite ice cream parlor! Why would you rather want to live in the countryside? There the population density is much lower. People live scattered across villages. It is wonderfully quiet and clean. However, you have fewer amenities. For example, you have to do without a cinema or museum. You call the distribution of people across an area population distribution. If approximately the same number of people live everywhere, the population distribution is even.* | *Some people are an urbanite, others prefer peace and nature. In cities people live close together. An example is the crowded city of Amsterdam. The population density is high there. Many large cities are situated along a river or canal. In the past, products were mainly transported by water. Even now cities must be easily accessible, both by water and by land. Therefore, cities are often located in flat areas and valleys. Cities have many facilities, such as hospitals, libraries, and stores. And there are popular ice cream parlors. Yet there are also people who would rather want to live in the countryside. There the population density is much lower. People live scattered across villages. It is quieter and cleaner. However, there are fewer facilities. For example, there is no cinema or museum. The distribution of people across an area is called population distribution. If approximately the same number of people live everywhere, the population distribution is even.* |

D. Internet en globalisering – *Internet and globalization* (human geography, 150 words in Dutch version)

| Voice | No voice |
|---|---|
| Heb je weleens zonder internet op afstand proberen te communiceren? Lastig hè? Je vrienden een berichtje sturen via WhatsApp, Snapchat of Instagram gaat niet meer. Als je iets wilt afspreken of vertellen, dan moet het via de telefoon. Of je moet wachten tot je jouw vrienden weer in het echt ziet, maar dan ben je het misschien alweer vergeten. Via internet bereik je gemakkelijk veel plaatsen op de wereld. Je kunt naar liedjes van over de hele wereld luisteren of naar internationale films kijken. Je kunt informatie opzoeken en zelf nieuwe informatie plaatsen. Daardoor wordt de uitwisseling van ideeën en kennis over de wereld steeds groter. We bestellen goederen van over de hele wereld, zoals die hippe sportschoenen. Door al die bestellingen wordt er meer vervoerd over de wereld en neemt het transport toe. Zo ontstaat een samenleving waarbij de hele wereld met elkaar verbonden is. Dit noemen we globalisering. | Zonder internet communiceren op afstand gaat een stuk lastiger dan met internet. Anderen een berichtje sturen via WhatsApp, Snapchat of Instagram gaat niet meer. Als mensen iets willen afspreken of vertellen, dan moet het via de telefoon. Of ze moeten wachten tot ze elkaar weer in het echt zien, maar dan zijn ze het misschien alweer vergeten. Via internet ligt de hele wereld binnen handbereik. Er kan naar liedjes van over de hele wereld worden geluisterd of worden gekeken naar internationale films. Informatie kan worden opgezocht en nieuwe informatie kan worden geplaatst. Daardoor wordt de uitwisseling van ideeën en kennis over de wereld steeds groter. Mensen bestellen goederen van over de hele wereld, zoals de nieuwste schoenen of petten. Door al die bestellingen wordt er meer vervoerd over de wereld en neemt het transport toe. Zo ontstaat een samenleving waarbij de hele wereld met elkaar verbonden is. Dit heet globalisering. |
| *Have you ever tried to communicate remotely without the Internet? Inconvenient, isn't it? Sending your friends a message via WhatsApp, Snapchat or Instagram is no longer possible. If you want to meet up or tell them something, it has to be over the phone. Or you have to wait until you see your friends again in real life, but then you might have forgotten about it already. Through the Internet you can easily reach many places in the world. You can listen to songs from all over the world or watch international movies. You can look up information and post new information yourself. As a result, the exchange of ideas and knowledge around the world is increasing. We order goods from all over the world, such as those trendy sports shoes. Because of all these orders, more is being shipped around the world and transportation is increasing. This creates a society where the whole world is connected. We call this globalization.* | *Communicating remotely without the Internet is a lot more inconvenient than communicating with the Internet. Sending others a message via WhatsApp, Snapchat or Instagram is no longer possible. If people want to meet up or tell each other something, it has to be over the phone. Or they have to wait until they see each other in real life again, but by then they may have forgotten about it. Through the Internet, the whole world is within reach. Songs from all over the world can be listened to or international movies can be watched. Information can be looked up and new information can be posted. As a result, the exchange of ideas and knowledge around the world is increasing. People order goods from all over the world, such as the latest shoes or caps. Because of all these orders, more is being shipped around the world and transportation is increasing. This creates a society where the whole world is connected. This is called globalization.* |

E. Het Nederlandse klimaat – *The Dutch climate* (physical geography, 189 words in Dutch version)

| Voice | No voice |
|---|---|
| Is het jou opgevallen hoe vaak wij over het weer praten? Meestal mopperen we: het is te warm, te koud, te nat, te droog, of er is te veel wind of te weinig. Het weer in ons land kan snel veranderen. Soms is het elke dag anders. In andere landen is het weer soms lange tijd hetzelfde. Het weer in een gebied wordt bepaald door de temperatuur, de wind en de neerslag, zoals regen en sneeuw. Als je het weer in een groot gebied meet over een periode van dertig jaar, dan weet je welk klimaat er heerst. Het klimaat is het soort weer dat normaal is voor een gebied. Bij het klimaat in ons land horen regen en mist, maar ook frisse zomerdagen. Toch is er soms een hittegolf of vriest het heel streng. Wist jij dat de hoogste temperatuur die ooit in ons land is gemeten 40,7 °c is en de laagste temperatuur -27,4 °c? Zulk weer is niet normaal voor ons land. De zomers zijn hier gemiddeld niet erg warm en de winters niet bijzonder koud. Zeer hoge of lage temperaturen horen niet bij ons klimaat. | Nederlanders hebben het opvallend vaak over het weer. Meestal wordt er gemopperd: het is te warm, te koud, te nat, te droog, of er is te veel wind of te weinig. Het weer in Nederland kan snel veranderen. Soms is het elke dag anders. In andere landen is het weer soms lange tijd hetzelfde. Het weer in een gebied wordt bepaald door de temperatuur, de wind en de neerslag, zoals regen en sneeuw. Als het weer in een groot gebied wordt gemeten over een periode van dertig jaar, dan kan worden bepaald welk klimaat er heerst. Het klimaat is het soort weer dat normaal is voor een gebied. Bij het klimaat in Nederland horen regen en mist, maar ook frisse zomerdagen. Toch is er soms een hittegolf of vriest het heel streng. De records laten zien dat de hoogste temperatuur die ooit in Nederland is gemeten 40,7 °c is en de laagste temperatuur -27,4 °c. Zulk weer is niet normaal voor het land. De zomers zijn in Nederland gemiddeld niet erg warm en de winters niet bijzonder koud. Zeer hoge of lage temperaturen horen niet bij het Nederlandse klimaat. |
| *Have you noticed how often we talk about the weather? Usually we grumble: it is too hot, too cold, too wet, too dry, or there is too much wind or too little. The weather in our country can change quickly. Sometimes it changes every day. In other countries, the weather can be the same for a long time. The weather in an area is determined by temperature, wind, and precipitation, such as rain and snow. If you measure the weather in a large area over a thirty-year period, you will know what climate prevails. The climate is the kind of weather that is normal for an area. Our country's climate includes rain and fog, as well as cool summer days. Still, sometimes there is a heat wave or it freezes very hard. Did you know that the highest temperature ever recorded in our country is 40.7 °c and the lowest temperature -27.4 °c? Such weather is not normal for our country. On average, summers here are not very hot and winters are not particularly cold. Very high or low temperatures are not part of our climate.* | *The Dutch talk about the weather remarkably often. Mostly they grumble: it is too hot, too cold, too wet, too dry, or there is too much wind or too little. The weather in the Netherlands can change quickly. Sometimes it is different every day. In other countries, the weather can be the same for a long time. The weather in an area is determined by temperature, wind, and precipitation, such as rain and snow. If the weather in a large area is measured over a thirty-year period, it is possible to determine what climate prevails. The climate is the type of weather that is normal for an area. The climate in the Netherlands includes rain and fog, but also cool summer days. Still, sometimes there is a heat wave or it freezes very hard. The records show that the highest temperature ever recorded in the Netherlands is 40.7 °c and the lowest temperature -27.4 °c. Such weather is not normal for the country. On average, summers in the Netherlands are not very warm and winters are not particularly cold. Very high or low temperatures are not part of the Dutch climate.* |

F. De oceaan – *The ocean* (physical geography, 125 words in Dutch version)

| Voice | No voice |
|---|---|
| Jij denkt misschien dat er veel oceanen op onze wereld zijn. Dat is niet zo: eigenlijk is het er maar ééntje! Al het water rondom de werelddelen staat namelijk met elkaar in verbinding. Je merkt er niets van als je ten zuiden van Zuid-Amerika vanaf de Atlantische Oceaan de Grote Oceaan opvaart. Nou ja, niets? Het kan er wel flink stormen. Als er maar één oceaan is, waarom hebben we dan al die verschillende namen verzonnen? Dat komt doordat het makkelijker praat als je weet welk deel van de oceaan iemand bedoelt. Dankzij die namen hoef je niet te zeggen: het stuk oceaan ten noorden van Europa, Azië en Amerika, waar het zo koud is. Jij weet natuurlijk allang dat dit de Noordelijke IJszee is! | Veel mensen denken dat er veel oceanen op de wereld zijn. Dat is niet zo: de wereld heeft maar één oceaan. Al het water rondom de werelddelen staat namelijk met elkaar in verbinding. Schippers merken er niets van als ze ten zuiden van Zuid-Amerika vanaf de Atlantische Oceaan de Grote Oceaan opvaren. Of misschien toch een beetje. Het kan er wel flink stormen. Hoewel er maar één oceaan is, hebben de delen allerlei verschillende namen. Dat komt doordat het makkelijker praat als duidelijk is welk deel van de oceaan iemand bedoelt. Dankzij die namen zijn de omschrijvingen minder lang dan: het stuk oceaan ten noorden van Europa, Azië en Amerika, waar het zo koud is. Dit deel van de oceaan wordt de Noordelijke IJszee genoemd. |
| *You may think there are many oceans in our world. That is incorrect: in fact, there is only one! This is because all the water around the continents is connected. You will not notice if you sail south of South America from the Atlantic Ocean into the Pacific Ocean. Well, nothing? It can be quite stormy. If there is only one ocean, why did we come up with all these different names? That is because it is easier to talk when you know which part of the ocean someone is talking about. Thanks to these names you do not have to say: the part of the ocean north of Europe, Asia and America, where it is so cold. You, of course, already know that this is the Arctic Ocean!* | *Many people think there are many oceans in the world. That is incorrect: the world has only one ocean. This is because all the waters around the continents are connected. Skippers will not notice this when they sail south of South America from the Atlantic Ocean into the Pacific Ocean. Or maybe a little. It can be quite stormy. Although there is only one ocean, its parts have all kinds of different names. This is because it is easier to talk when it is clear which part of the ocean someone is referring to. Thanks to these names, the descriptions are shorter than: the piece of ocean north of Europe, Asia and America, where it is so cold. This part of the ocean is called the Arctic Ocean.* |

G. Landbouw en klimaat – *Agriculture and the climate* (physical geography, 149 words in Dutch version)

| Voice | No voice |
|---|---|
| Lijkt het jou ook geweldig om sinaasappels te kweken in je eigen tuintje? Helaas, sinaasappelbomen groeien slecht in ons zeeklimaat. Ze hebben namelijk veel zon en warmte nodig. Daarom groeien ze vooral in landen met een Middellandse Zeeklimaat. Denk maar aan Italië en Griekenland. Door hun dikke schil drogen sinaasappels niet snel uit in de felle zon. Ook olijven, amandelen en druiven kunnen goed tegen de droge zomers in die gebieden. Welke gewassen groeien er dan wel in ons zeeklimaat? Appels en peren doen het hier prima. Boerenkool en spruitjes worden zelfs lekkerder als het heeft gevroren. Welke gewassen jij in je tuintje kunt verbouwen, hangt dus af van het klimaat. Niet alleen het klimaat speelt een belangrijke rol in de landbouw, ook de grondsoort is belangrijk. Op kleigrond groeien bepaalde gewassen beter dan op zandgrond. Op kale rotsen groeit niets, ook al heb je nog zo'n geschikt klimaat. | Sinaasappels worden meestal niet gekweekt in Nederlandse tuinen of kwekerijen. Sinaasappelbomen groeien slecht in het Nederlandse zeeklimaat. Ze hebben namelijk veel zon en warmte nodig. Daarom groeien ze vooral in landen met een Middellandse Zeeklimaat, zoals Italië, Griekenland en Spanje. Door hun dikke schil drogen sinaasappels niet snel uit in de felle zon. Ook olijven, amandelen en druiven kunnen goed tegen de droge zomers in die gebieden. In het Nederlandse zeeklimaat groeien wel veel andere gewassen. Appels en peren doen het op Nederlandse bodem prima. Boerenkool en spruitjes worden zelfs lekkerder als het heeft gevroren. Welke gewassen in een tuin of kwekerij kunnen worden verbouwd, hangt dus af van het klimaat. Niet alleen het klimaat speelt een belangrijke rol in de landbouw, ook de grondsoort is belangrijk. Op kleigrond groeien bepaalde gewassen beter dan op zandgrond. Op kale rotsen groeit niets, ook al is het klimaat nog zo geschikt. |
| *Would you also love to grow oranges in your own garden? Unfortunately, orange trees grow poorly in our oceanic climate. They need a lot of sun and warmth. That is why they grow mainly in countries with a Mediterranean climate. Just think of Italy and Greece. Because of their thick skin, oranges do not dry out quickly in the bright sunlight. Olives, almonds, and grapes can also withstand the dry summers in those areas. So what kinds of crops grow in our oceanic climate? Apples and pears do fine here. Kale and sprouts are even tastier when it has frozen. What crops you can grow in your garden thus depends on the climate. Not only the climate plays an important role in agriculture, also the type of soil is important. On clay soil, certain crops grow better than on sandy soil. On bare rock nothing grows, even if you have a very suitable climate.* | *Oranges are usually not grown in Dutch gardens or nurseries. Orange trees grow poorly in the Dutch oceanic climate. They need a lot of sun and warmth. Therefore, they grow mainly in countries with a Mediterranean climate, such as Italy, Greece and Spain. Because of their thick skin, oranges do not dry out quickly in the bright sunlight. Olives, almonds, and grapes can also withstand the dry summers in those areas. Many other kinds of crops grow in the Dutch oceanic climate. Apples and pears do fine on Dutch soil. Kale and sprouts become even tastier when it has frozen. What crops can be grown in a garden or truck farm thus depends on the climate. Not only the climate plays an important role in agriculture, also the type of soil is important. On clay soil, certain crops grow better than on sandy soil. On bare rock nothing grows, no matter how suitable the climate is.* |

H. De Afrikaanse berg Kilimanjaro – *The African mountain Kilimanjaro* (physical geography, 172 words in Dutch version)

| Voice | No voice |
|---|---|
| Denk jij dat elk gebied op aarde maar één klimaat heeft? Dat is niet zo! Er zijn plekken op de wereld waar allerlei verschillende klimaten samenkomen. Reis maar mee naar de machtige berg Kilimanjaro. Hij ligt in het Afrikaanse Tanzania en is met zijn 5892 meter de hoogste berg van Afrika. De Kilimanjaro is gevormd door drie vulkanen. Hoewel de Kilimanjaro in de tropen ligt, niet ver van de evenaar, vind je op de berg verschillende klimaatzones. Aan de voet van de berg liggen savannen en op de hoogste toppen vind je sneeuw. Helaas is er de laatste eeuw veel sneeuw van de toppen van de Kilimanjaro verdwenen. Komt dit door de opwarming van de aarde? Veel wetenschappers hebben zich in deze kwestie verdiept. Het antwoord blijkt jammer genoeg niet zo simpel. Een belangrijke oorzaak van het verdwijnen van sneeuw is in ieder geval het kappen van de bomen op de berghelling. Dit heeft gevolgen voor de temperatuur en de vochtigheid en daarmee ook voor de hoeveelheid sneeuw en ijs. Hartstikke zonde! | Sommige gebieden op aarde hebben maar één klimaat. Maar dat geldt niet voor elk gebied. Er zijn plekken op de wereld waar allerlei verschillende klimaten samenkomen. Een voorbeeld is de berg Kilimanjaro. Hij ligt in het Afrikaanse Tanzania en is met zijn 5892 meter de hoogste berg van Afrika. De Kilimanjaro is gevormd door drie vulkanen. Hoewel de Kilimanjaro in de tropen ligt, niet ver van de evenaar, zijn er op de berg verschillende klimaatzones. Aan de voet van de berg liggen savannen en op de hoogste toppen ligt sneeuw. Onderzoek heeft laten zien dat er de laatste eeuw veel sneeuw van de toppen van de Kilimanjaro is verdwenen. Dit wordt mogelijk veroorzaakt door de opwarming van de aarde. Veel wetenschappers hebben zich in deze kwestie verdiept. Het antwoord blijkt echter niet zo simpel. Een belangrijke oorzaak van het verdwijnen van sneeuw is in ieder geval het kappen van de bomen op de berghelling. Dit heeft gevolgen voor de temperatuur en de vochtigheid en daarmee ook voor de hoeveelheid sneeuw en ijs. |
| *Do you think that all areas on earth have just one climate? That is not true! There are places in the world where all kinds of climates come together. Just travel along to the mighty mountain Kilimanjaro. It is located in African Tanzania and with its 5892 meters, it is the highest mountain of Africa. The Kilimanjaro was formed by three volcanoes. Although the Kilimanjaro is located in the tropics, not far from the equator, you can find different climate zones on the mountain. At the foot of the mountain are savannas and on the highest peaks there is snow. Unfortunately, in the last century a lot of snow has disappeared from the peaks of the Kilimanjaro. Is this caused by global warming? Many scientists have investigated this issue. Unfortunately, the answer is not that simple. In any case, a major cause of the disappearance of snow is the cutting of trees on the mountain slope. This affects the temperature and humidity, and by that, the amount of snow and ice. A great pity!* | *Some areas of earth have just one climate. But this is not true for all areas. There are places in the world where all kinds of climates come together. One example is the mountain Kilimanjaro. It is located in African Tanzania and with its 5892 meters, it is the highest mountain of Africa. The Kilimanjaro was formed by three volcanoes. Although the Kilimanjaro is located in the tropics, not far from the equator, there are different climate zones on the mountain. At the foot of the mountain are savannas and on the highest peaks there is snow. Research has shown that in the last century, a lot of snow has disappeared from the peaks of the Kilimanjaro. This may be caused by global warming. Many scientists have investigated this issue. However, the answer is not that simple. In any case, a major cause of the disappearance of snow is the cutting of trees on the mountain slope. This affects the temperature and humidity, and by that, the amount of snow and ice.* |

*Distribution of topics and conditions over booklets*

Topics for human geography (GH)

A. The European Union
B. Emigration abroad
C. Population distribution
D. Internet and globalization

Topics for physical geography (GP)

E. The Dutch climate
F. The ocean
G. Agriculture and climate
H. The African mountain Kilimanjaro

Voice (V) vs. no voice (NV)

| Booklet 1 | | | Booklet 2 | | | Booklet 3 | | | Booklet 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | GP | V | E | GP | NV | A | GH | V | A | GH | NV |
| A | GH | NV | A | GH | V | E | GP | NV | E | GP | V |
| F | GP | NV | F | GP | V | B | GH | NV | B | GH | V |
| B | GH | V | B | GH | NV | F | GP | V | F | GP | NV |
| G | GP | V + NV | G | GP | NV + V | D | GH | V + NV | D | GH | NV + V |
| C | GH | V + NV | C | GH | NV + V | H | GP | V + NV | H | GP | NV + V |

| Booklet 5 | | | Booklet 6 | | | Booklet 7 | | | Booklet 8 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| G | GP | V | G | GP | NV | C | GH | V | C | GH | NV |
| C | GH | NV | C | GH | V | G | GP | NV | G | GP | V |
| H | GP | NV | H | GP | V | D | GH | NV | D | GH | V |
| D | GH | V | D | GH | NV | H | GP | V | H | GP | NV |
| E | GP | V + NV | E | GP | NV + V | B | GH | V + NV | B | GH | NV + V |
| A | GH | V + NV | A | GH | NV + V | F | GP | V + NV | F | GP | NV + V |

## Appendix F Statistical models for the voice experiment (Chapter 7)

*Comprehension questions – Generalized linear mixed model (Voice vs. Sub-domain)*[1]

| | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| *Model 0 | 457.9 | | | |
| Model 1 (+VOICE) | 455.6 | 2.35 | 1 | .126 |
| Model 2 (+SUB-DOMAIN) | 455.4 | 0.22 | 1 | .641 |
| Model 3 (+VOICE:SUB-DOMAIN) | 455.4 | 0.00 | 1 | .977 |

*Task 1 (free choice) – Linear mixed model (Voice vs. Sub-domain)*

| | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| *Model 0 | 763.8 | | | |
| Model 1 (+VOICE) | 761.4 | 2.46 | 1 | .117 |
| Model 2 (+SUB-DOMAIN) | 759.0 | 2.36 | 1 | .125 |
| Model 3 (+VOICE:SUB-DOMAIN) | 758.7 | 0.34 | 1 | .562 |

*Task 1 (free choice) – Exploratory linear mixed model (Voice vs. Notice)*

| | -2LL | $\Delta\chi^2$ | $\Delta$df | p |
|---|---|---|---|---|
| Model 0 | 763.8 | | | |
| Model 1 (+VOICE) | 761.4 | 2.46 | 1 | .117 |
| Model 2 (+NOTICE) | 761.3 | 0.04 | 1 | .844 |
| *Model 3 (+VOICE:NOTICE) | 754.4 | 6.95 | 1 | .008 |

*Task 1 (free choice) – Exploratory predicted probability (Voice vs. Notice)*

| | Probability | SE | LCL | UCL |
|---|---|---|---|---|
| No notice – Voice | 3.85 | 0.08 | 3.68 | 4.01 |
| No notice – No voice | 3.63 | 0.08 | 3.47 | 3.80 |
| Notice – Voice | 3.71 | 0.10 | 3.52 | 3.90 |
| Notice – No voice | 3.80 | 0.10 | 3.61 | 4.00 |

*Task 1 (free choice) – Exploratory post hoc Tukey scores (Voice vs. Notice)*

| Contrasts | | | OR | SE | z | p |
|---|---|---|---|---|---|---|
| No notice –Voice | / | No notice – No voice | 0.22 | 0.07 | 2.90 | .021 |
| Notice – Voice | / | Notice – No voice | -0.09 | 0.09 | -1.04 | .727 |

[1] The Asterisk indicates the model that was proven to be the best fitting model.

*Task 2 (forced choice) – Log-linear analyses (Voice vs. Sub-domain)*

1. Nicest to read

**Backward elimination**

| Step | | | Effect | $\Delta\chi^2$ | $\Delta$df | p | Number of iterations |
|---|---|---|---|---|---|---|---|
| 0 | Generating class | | Voice:Sub-domain | 0.00 | 0 | | |
| | Deleted effect | 1 | Voice:Sub-domain | 0.06 | 2 | .973 | 2 |
| 1 | Generating class | | Voice, Sub-domain | 0.06 | 2 | .973 | |
| | Deleted effect | 1 | Voice | 18.16 | 2 | .000 | 2 |
| | | 2 | Sub-domain | 0.01 | 1 | .943 | 2 |
| 2 | Generating class | | Voice | 0.06 | 3 | .996 | |
| | Deleted effect | 1 | Voice | 18.16 | 2 | .000 | 0 |
| 3 | Generating class | | Voice | 0.06 | 3 | .996 | |

**Parameter estimates**

| Effect | Estimate | Std. error | z | p | 95% confidence interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower bound | Upper bound |
| Constant | 3.829 | .104 | 36.723 | .000 | 3.624 | 4.033 |
| No preference | -.738 | .183 | -4.024 | .000 | -1.097 | -.378 |
| No voice | -.444 | .167 | -2.664 | .008 | -.771 | -.117 |
| Voice | 0* | | | | | |

* This parameter is set to zero because it is redundant.

2. Most clearly written

**Backward elimination**

| Step | | | Effect | $\Delta\chi^2$ | $\Delta$df | p | Number of iterations |
|---|---|---|---|---|---|---|---|
| 0 | Generating class | | Voice:Sub-domain | 0.00 | 0 | | |
| | Deleted effect | 1 | Voice:Sub-domain | 0.46 | 2 | .795 | 2 |
| 1 | Generating class | | Voice, Sub-domain | 0.46 | 2 | .795 | |
| | Deleted effect | 1 | Voice | 7.55 | 2 | .023 | 2 |
| | | 2 | Sub-domain | 0.01 | 1 | .943 | 2 |
| 2 | Generating class | | Voice | 0.46 | 3 | .927 | |
| | Deleted effect | 1 | Voice | 7.55 | 2 | .023 | 0 |
| 3 | Generating class | | Voice | 0.46 | 3 | .927 | |

**Parameter estimates**

| Effect | Estimate | Std. error | z | p | 95% confidence interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower bound | Upper bound |
| Constant | 3.689 | .112 | 32.999 | .000 | 3.470 | 3.908 |
| No preference | -.490 | .181 | -2.703 | .007 | -.846 | -.135 |
| No voice | -.192 | .166 | -1.157 | .247 | -.518 | .134 |
| Voice | 0* | | | | | |

* This parameter is set to zero because it is redundant.

3. Addressing most directly

**Backward elimination**

| Step | | Effect | | $\Delta\chi^2$ | $\Delta$df | p | Number of iterations |
|---|---|---|---|---|---|---|---|
| 0 | Generating class | | Voice:Sub-domain | 0.00 | 0 | | |
| | Deleted effect | 1 | Voice:Sub-domain | 1.46 | 2 | .482 | 2 |
| 1 | Generating class | | Voice, Sub-domain | 1.46 | 2 | .482 | |
| | Deleted effect | 1 | Voice | 42.85 | 2 | .000 | 1 |
| | | 2 | Sub-domain | 0.00 | 1 | 1.00 | 2 |
| 2 | Generating class | | Voice | 1.46 | 3 | .692 | |
| | Deleted effect | 1 | Voice | 42.85 | 2 | .000 | 0 |
| 3 | Generating class | | Voice | 1.45 | 3 | .693 | |

**Parameter estimates**

| Effect | Estimate | Std. error | z | p | 95% confidence interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower bound | Upper bound |
| Constant | 4.007 | .095 | 42.031 | .000 | 3.820 | 4.194 |
| No preference | -.894 | .177 | -5.051 | .000 | -1.241 | -.547 |
| No voice | -.987 | .183 | -5.394 | .000 | -1.346 | -.628 |
| Voice | 0* | | | | | |

* This parameter is set to zero because it is redundant.

*Task 2 (forced choice) – Exploratory log-linear analyses (Voice vs. Notice)*

1. Nicest to read

**Backward elimination**

| Step | | | Effect | $\Delta\chi^2$ | $\Delta$df | p | Number of iterations |
|---|---|---|---|---|---|---|---|
| 0 | Generating class | | Voice:Notice | 0.00 | 0 | | |
| | Deleted effect | 1 | Voice:Notice | 2.04 | 2 | .361 | 2 |
| 1 | Generating class | | Voice, Notice | 2.04 | 2 | .361 | |
| | Deleted effect | 1 | Voice | 18.16 | 2 | .000 | 2 |
| | | 2 | Notice | 4.95 | 1 | .026 | 2 |
| 2 | Generating class | | Voice | 2.02 | 2 | .364 | |

**Parameter estimates**

| Effect | Estimate | Std. error | z | p | 95% confidence interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower bound | Upper bound |
| Constant | 3.656 | .134 | 27.295 | .000 | 3.393 | 3.918 |
| No preference | -.738 | .183 | -4.024 | .000 | -1.097 | -.378 |
| No voice | -.444 | .167 | -2.664 | .008 | -.771 | -.117 |
| Voice | 0* | | | | | |

* This parameter is set to zero because it is redundant.

2. Most clearly written

**Backward elimination**

| Step | | | Effect | $\Delta\chi^2$ | $\Delta$df | p | Number of iterations |
|---|---|---|---|---|---|---|---|
| 0 | Generating class | | Voice:Notice | 0.00 | 0 | | |
| | Deleted effect | 1 | Voice:Notice | 6.67 | 2 | .036 | 2 |
| 1 | Generating class | | Voice, Notice | 0.00 | 0 | | |

**Partial associations**

| Effect | $\Delta$df | $\Delta\chi^2$ | p | Number of iterations |
|---|---|---|---|---|
| Voice | 2 | 7.55 | .023 | 2 |
| Notice | 1 | 4.95 | .026 | 2 |

**Parameter estimates**

| Effect | Estimate | Std. error | z | p | 95% confidence interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower bound | Upper bound |
| Constant | 3.418 | .181 | 18.875 | .000 | 3.063 | 3.773 |
| No preference | -.614 | .306 | -2.010 | .044 | -1.213 | -.015 |
| No voice | .180 | .245 | .732 | .464 | -.301 | .660 |
| Voice | 0* | | | | | |
| No notice | .504 | .229 | 2.199 | .028 | .055 | .954 |
| Notice | 0* | | | | | |
| No preference:No notice | .204 | .378 | .539 | .590 | -.537 | .945 |
| No preference:Notice | 0* | | | | | |
| No voice:No notice | -.684 | .336 | -2.036 | .042 | -1.342 | -.026 |
| No voice:Notice | 0* | | | | | |
| Voice:No notice | 0* | | | | | |
| Voice:Notice | 0* | | | | | |

* This parameter is set to zero because it is redundant.

3. Addressing most directly

**Backward elimination**

| Step | | | Effect | $\Delta\chi^2$ | $\Delta$df | p | Number of iterations |
|---|---|---|---|---|---|---|---|
| 0 | Generating class | | Voice:Notice | 0.00 | 0 | | |
| | Deleted effect | 1 | Voice:Notice | 18.63 | 2 | .000 | 2 |
| 1 | Generating class | | Voice, Notice | 0.00 | 0 | | |

**Partial associations**

| Effect | $\Delta$df | $\Delta\chi^2$ | p | Number of iterations |
|---|---|---|---|---|
| Voice | 2 | 42.85 | .000 | 2 |
| Notice | 1 | 5.25 | .022 | 2 |

**Parameter estimates**

| Effect | Estimate | Std. error | z | p | 95% confidence interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower bound | Upper bound |
| Constant | 4.103 | .129 | 31.911 | .000 | 3.851 | 4.355 |
| No preference | -1.851 | .349 | -5.305 | .000 | -2.535 | -1.167 |
| No voice | -1.500 | .301 | -4.983 | .000 | -2.090 | -.910 |
| Voice | 0* | | | | | |
| No notice | -.181 | .191 | -.948 | .343 | -.554 | .193 |
| Notice | 0* | | | | | |
| No preference:No notice | 1.527 | .411 | 3.714 | .000 | .721 | 2.332 |
| No preference:Notice | 0* | | | | | |
| No voice:No notice | .928 | .381 | 2.433 | .015 | .180 | 1.675 |
| No voice:Notice | 0* | | | | | |
| Voice:No notice | 0* | | | | | |
| Voice:Notice | 0* | | | | | |

* This parameter is set to zero because it is redundant.

# Nederlandse samenvatting

## Levendige educatieve teksten: Verhalende en stem-elementen als motiverende factoren

In de huidige Nederlandse onderwijspraktijk spelen schoolboeken een belangrijke rol in de overdracht van kennis: voor 70 procent van de basisschoolleerlingen en 63 procent van de middelbare scholieren zijn educatieve teksten het voornaamste leermiddel (Woldhuis et al., 2018). Om te kunnen leren uit educatieve teksten, is het noodzakelijk dat leerlingen deze teksten goed begrijpen. Dit blijkt echter niet vanzelfsprekend: veel leerlingen vinden hun educatieve teksten saai en/of ervaren problemen bij het begrijpen ervan (Dood et al., 2020; Gubbels et al., 2017, 2019; Inspectie van het Onderwijs, 2017, 2020, 2021). Vooral bij zaakvakken zoals aardrijkskunde en biologie leveren educatieve teksten begripsproblemen op, omdat in teksten voor deze vakken vaak vakspecifieke terminologie wordt geïntroduceerd, schooltaal wordt gebruikt, en/of er onderwerpen worden besproken die leerlingen niet direct kunnen relateren aan hun belevingswereld en/of voorkennis (Allington, 2002; Best et al., 2005; Bogaert et al., 2008; Chambliss, 2002; Graesser et al., 2002; Lee & Spratley, 2010; Schleppegrell, 2004).

Aangezien tekstbegrip tot stand komt via complexe interacties tussen lezers-, taak-, en tekstkenmerken, kan de optimalisatie ervan vanuit meerdere kanten worden benaderd (Snow, 2002; White, 2010). In dit proefschrift richten we ons niet op lezers- of taakkenmerken, maar op de kenmerken van educatieve teksten. Hierbij staat de volgende overkoepelende onderzoeksvraag centraal:

> Wat is levendigheid in educatieve teksten, en hoe en waarom wordt het toegepast in de Nederlandse onderwijspraktijk?

We focussen op twee strategieën die door educatieve uitgevers lijken te worden ingezet om educatieve teksten levendiger te maken, met als doel leerlingen meer te motiveren en daarmee hun tekstbegrip te vergroten: verhalende en stem-elementen. In schoolboeken vinden we namelijk niet alleen puur informatieve teksten, zoals de biologietekst in (1), waarin het vakspecifieke begrip “biodiversiteit” wordt uitgelegd.

(1) Er zijn miljoenen verschillende soorten levende wezens. Die grote variatie noem je biodiversiteit. Bio is leven en divers betekent verschillend. Iets leeft als het alle of de meeste van deze kenmerken heeft: voortplanten, groeien, bewegen, reageren, ademhalen, eten en uitscheiden.
(*Binnenstebuiten*, biologie groep 7, p. 9)

We komen ook educatieve teksten tegen waaraan verhalende elementen zijn toegevoegd. Zo wordt leerstof over reageerbuisbevruchting (ivf) in de biologietekst in (2) uitgelegd middels een voorbeeldgeschiedenis van een Indiase vrouw en haar man.

(2) De Indiase Rajo Devi Lohan is bevallen van een gezonde dochter. Rajo en haar man hebben jarenlang gehoopt op een kind, maar dat kwam er niet. Daarom besloten ze een ivf-behandeling te doen. Hierbij worden een eicel en een zaadcel in een reageerbuisje bij elkaar gebracht. Als ze samensmelten wordt het bevruchte eitje in de baarmoeder van de vrouw geplaatst.

(*Binnenstebuiten*, biologie groep 7, p. 44)

Daarnaast vinden we in schoolboeken educatieve teksten waarin de auteur als het ware tegen de leerlingen "spreekt", zoals in de geschiedenistekst in (3). In deze tekst introduceert de auteur leerstof over traditionele kledij door leerlingen een vraag te stellen die hen in staat stelt de leerstof te koppelen aan hun eigen wereld.

(3) Vind jij het belangrijk dat je kleren er leuk uitzien of lekker zitten? Vroeger vonden mensen kleren vooral belangrijk om hun lichaam te beschermen tegen het weer of tegen schrammen van takken. De kleding moest dus stevig en lekker warm zijn.

(*Wijzer! Geschiedenis*, geschiedenis groep 7, p. 16)

Allereerst hebben we onderzocht hoe de noties verhalendheid en "stem" kunnen worden gedefinieerd in de context van het educatieve domein (WAT). Vervolgens hebben we bekeken op welke wijze verhalende en stem-elementen worden toegepast in hedendaagse Nederlandse educatieve teksten (HOE). Tot slot zijn we nagegaan waarom educatieve uitgevers er wel of juist niet voor kiezen om verhalende en/of stem-elementen in te zetten in hun teksten (WAAROM). In wat volgt beschrijven we per deelvraag onze bevindingen.

## 1. WAT: definitie van verhalendheid en "stem" in educatieve teksten

In hoofdstuk 2 hebben we beredeneerd dat verhalende en stem-elementen passen binnen het begrip "levendigheid" zoals dit is gedefinieerd door Nisbett en Ross (1980). Zij omschrijven levendige teksten als teksten die de aandacht van lezers trekken en vasthouden en hun voorstellingsvermogen prikkelen doordat de inhoud van de tekst 1) emotioneel interessant, 2) concreet en tot de verbeelding sprekend, en 3) nabij is (Nisbett & Ross, 1980, p. 45). Emotionele interesse betreft de mate waarin lezers zich betrokken voelen bij de in de tekst beschreven gebeurtenissen. Zo vinden we gebeurtenissen die onszelf overkomen, of mensen die we kennen, interessanter

dan gebeurtenissen die gaan over onbekenden. Concreetheid heeft te maken met de mate van detail in een tekst: meer details over personen, gebeurtenissen en situaties maken het voor lezers gemakkelijker om zich een beeld te vormen van de tekstinhoud. Nabijheid heeft betrekking op de relatieve zintuiglijke, temporele en ruimtelijke afstand tussen lezers en de inhoud van een tekst. Een gebeurtenis die vandaag in onze eigen straat heeft plaatsgevonden, vinden we bijvoorbeeld boeiender dan een gebeurtenis die een tijd terug plaatsvond in een ander land. Nisbett en Ross (1980) stellen dat hoe levendiger een tekst is, hoe waarschijnlijker het is dat lezers de inhoud ervan opslaan in hun geheugen en onthouden.

Aangezien verhalen veelal als emotioneel interessant worden beschouwd, concrete taal bevatten en de verbeelding van lezers prikkelen, verbonden we in hoofdstuk 2 verhalende elementen aan de eerste twee dimensies van levendigheid uit de definitie van Nisbett en Ross (1980). Stem-elementen relateerden we daarentegen aan de derde dimensie van levendigheid, nabijheid, omdat deze elementen een "hier en nu"-interactie bewerkstelligen tussen de auteur van de educatieve tekst en de lezers ervan, de leerlingen. Door deze interactie worden leerlingen in staat gesteld de leerstof aan hun belevingswereld te koppelen, waardoor de afstand tussen hen en de leerstof wordt verkleind. Met andere woorden: de leerstof komt dichter bij de leerling. Door verhalende en stem-elementen te verbinden aan de dimensies van levendigheid van Nisbett en Ross (1980), positioneerden we ze als strategieën die de mate van levendigheid in een educatieve tekst verhogen.

Vervolgens koppelden we beide verlevendigende strategieën aan concrete tekstkenmerken. Op basis van definities uit de narratologische literatuur, in het bijzonder die van Toolan (2001), hebben we drie tekstkenmerken onderscheiden die een educatieve tekst meer verhalend maken, namelijk 1) een reeks gerelateerde specifieke gebeurtenissen, die worden beleefd door 2) een specifiek personage, van wie 3) lezers inzicht krijgen in de innerlijke wereld. Deze elementen worden bijvoorbeeld gecombineerd in de geschiedenistekst in (4), over de Romeinse legerleider Mauritius.

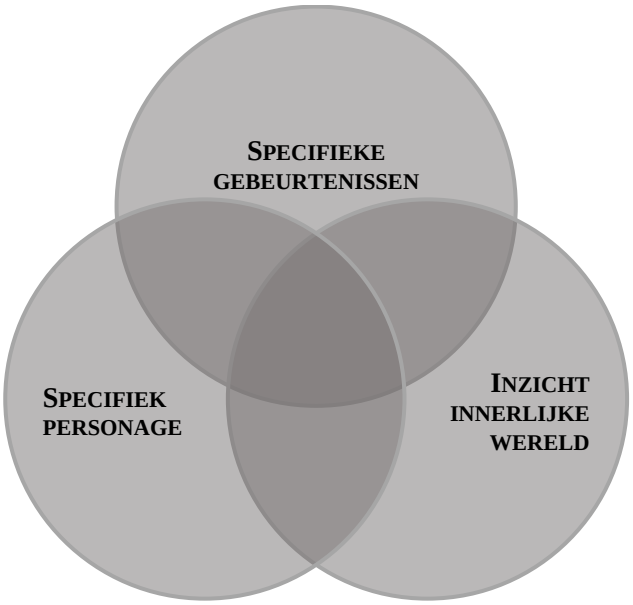
(4) Legerleider Mauritius kan niet slapen. Morgen vertrekt hij met zijn troepen naar Gallië om daar een opstand neer te slaan. Dat vindt Mauritius een prima plan. Er moet immers orde en rust zijn in het rijk! Maar de keizer gaf nóg een bevel: Mauritius moet alle christenen in het gebied doden. Mauritius is erg geschrokken: hij is zelf christen, net als zijn soldaten. Wat zal hij doen? De dagen erna kan hij aan niets anders denken. Maar als ze in Gallië aankomen, heeft hij een besluit genomen: Mauritius en zijn mannen weigeren om de christenen te doden. De keizer is woedend over zijn ongehoorzaamheid, en als straf laat de keizer Mauritius en zijn soldaten vermoorden. Later vond de kerk dat Mauritius een **heilige** was. Mensen gingen hem vereren en maakten afbeeldingen van hem.

(*Wijzer! Geschiedenis*, geschiedenis groep 7, p. 43)

In (4) vinden we een reeks aan elkaar gerelateerde gebeurtenissen rondom het personage Mauritius. Leerlingen krijgen inzicht in de innerlijke wereld van Mauritius door de expliciete weergave van zijn mening (“Dat vindt Mauritius een prima plan”), gevoelens (“Mauritius is erg geschrokken”) en gedachten (“Er moet immers orde en rust zijn in het rijk!”, “Wat zal hij doen?”).

Niet alle verhalende educatieve teksten bevatten alle drie de genoemde verhalende elementen; we vinden in schoolboeken ook teksten die slechts één of twee verhalende elementen laten zien. Om de verscheidenheid aan combinaties van verhalende elementen in educatieve teksten te visualiseren, introduceerden we in hoofdstuk 2 het analytisch model uit Figuur 1. De drie cirkels van het Venndiagram verbeelden ieder één van de drie verhalende elementen; de intersecties van de cirkels representeren de verschillende combinaties van verhalende elementen die worden teruggevonden in educatieve teksten. Figuur 1 laat zien dat educatieve teksten die minder uitgesproken verhalend zijn – dat wil zeggen, die slechts één of twee typen verhalende elementen bevatten – zich verder van de kern van de figuur bevinden dan educatieve teksten die alle typen verhalende elementen bevatten, en daarmee volledig verhalend zijn, zoals de tekst in (4).

**Figuur 1.**
De verschillende combinatiemogelijkheden van verhalende elementen in educatieve teksten




We definieerden stem-elementen als tekstelementen die door de auteur van een educatieve tekst worden gebruikt om tegen leerlingen te "spreken". Hiermee wordt als het ware een interactie gefaciliteerd tussen deze auteur, "de stem", en de leerlingen (vgl. Beck et al., 1995). De notie "stem" kwam op verschillende manieren tot uiting in educatieve teksten. Zo zagen we dat de auteur van een educatieve tekst naast het stellen van een vraag, zoals in (3), een evaluatie kan geven over de tekstinhoud ("Die is pas echt feestelijk met wat lucht erin"), een imperatief kan gebruiken om leerlingen aan te sporen ("Blaas maar eens door een rietje in een glas limonade"), een uitroep kan doen ("Lucht!"), en/of leerlingen kan aanspreken met "je"/"jij" (als individu) of "we"/"wij" (als groep). Deze stem-elementen worden gecombineerd in de biologietekst in (5).

(5) Wat kun je niet zien, ruiken of aanraken, maar bestaat wel? Lucht! Dit onzichtbare goedje is overal om ons heen. Stilstaande lucht kun je niet voelen. Toch neemt het ruimte in. Blaas maar eens door een rietje in een glas limonade. Wat je ziet zijn allemaal belletjes met lucht erin. En wat dacht je van een ballon? Die is pas echt feestelijk met flink wat lucht erin.
(*Argus Clou natuur en techniek*, biologie groep 7, p. 52)

Verhalende en stem-elementen lijken door educatieve uitgevers in hun teksten te worden ingezet om leerlingen meer te motiveren en hun tekstbegrip te vergroten. Het is echter onduidelijk wat de precieze effecten van de toepassing van deze elementen in educatieve teksten zijn. Hoewel de effectiviteit van stem-elementen in educatieve teksten nog niet uitgebreid is onderzocht, laten eerdere studies naar de effectiviteit van verhalende elementen in educatieve teksten tegenstrijdige resultaten zien; waar sommige studies rapporteren dat verhalende elementen positief bijdragen aan het begrijpen en onthouden van leerstof (e.g., Eng, 2002; Romero et al., 2005), laten andere studies juist negatieve effecten zien (e.g., Cervetti et al., 2009; van Silfhout, 2014).

Aangezien deze tegenstijdige resultaten het gevolg kunnen zijn van een te grote verscheidenheid aan experimentele tekstmanipulaties, probeerden we in hoofdstuk 3 meer inzicht te krijgen in de manier waarop het verhalende en het informatieve genre werden geoperationaliseerd in eerder effectonderzoek naar verhalendheid binnen het educatieve domein. Hiertoe analyseerden we uit zeven effectstudies 26 experimentele teksten die door de oorspronkelijke onderzoekers werden aangeduid als “verhalend” of juist “informatief”. Bij iedere tekst gingen we na in hoeverre de drie verhalende elementen uit hoofdstuk 2 erin voorkwamen. In de geselecteerde studies werd in zowel de verhalende tekst als de informatieve tegenhanger dezelfde leerstof aangeboden.

Onze tekstanalyses lieten zien dat de meeste teksten die door de betreffende onderzoekers werden aangeduid als “verhalend” alle drie de verhalende elementen bevatten, en dus kunnen worden geclassificeerd als volledig verhalend. Onverwacht vonden we daarnaast in de helft van de informatieve teksten ook één of meerdere verhalende elementen terug. Dit toont aan dat niet alle teksten die door de oorspronkelijke onderzoekers werden gekwalificeerd als “informatief” daadwerkelijk volledig informatief zijn. In eerdere effectstudies werd dus niet altijd een volledige manipulatie-afstand aangehouden, dat wil zeggen: het verschil in aantal typen verhalende elementen tussen de verhalende tekst en de informatieve tekst was niet altijd drie.

De gevonden variatie in manipulatie-afstand bleek echter geen nadere verklaring te bieden voor de tegenstrijdige resultaten uit de geselecteerde studies. In studies waarin de manipulatie-afstand tussen de verhalende tekst en de informatieve tekst het grootst was, werden soms, maar niet altijd, genre-effecten gevonden. Wanneer er wel sprake was van genre-effecten, was de richting van het effect bovendien niet steeds dezelfde. In studies met een kleine manipulatie-afstand werden daarentegen dikwijls genre-effecten gevonden, zelfs als er geen enkel verschil was in manipulatie-afstand tussen de verhalende experimentele teksten en de informatieve experimentele teksten. Toch verschilde ook hier de richting van het effect: de verhalende teksten scoorden soms beter dan de informatieve teksten, dan weer slechter, en soms vergelijkbaar.

Ook voor specifieke combinaties van verhalende elementen vonden we geen eenduidige patronen. Wanneer er genre-effecten werden gevonden die eenzelfde richting op vielen, lagen hier vaak verschillende combinaties van verhalende elementen aan ten grondslag. Wanneer wél dezelfde combinatie van verhalende elementen werd gebruikt, leidde dit bovendien niet tot vergelijkbare genre-effecten.

We vonden slechts één eenduidig patroon: in geen enkele studie werd een genre-effect gevonden voor tekstwaardering. Dit suggereert dat het leerlingen niet uitmaakt of zij leerstof krijgen aangeboden via een meer of minder verhalende tekst. Mocht dit inderdaad zo zijn, dan zou dit een fundamentele reden voor de toepassing van verhalende elementen in educatieve teksten wegnemen. Echter, gezien de grote verscheidenheid aan tekstmanipulaties in de geselecteerde studies kunnen we nog geen definitieve conclusies trekken over de effectiviteit van verhalende versus informatieve educatieve teksten. Om zulke conclusies in de toekomst wél te kunnen trekken is systematischer vervolgonderzoek nodig.

## 2. HOE: toepassing van verhalende en stem-elementen in educatieve teksten

Om te voorkomen dat toekomstige onderzoeksresultaten onvergelijkbaar zijn door een te grote verscheidenheid aan toegepaste tekstmanipulaties, en deze in plaats daarvan zoveel mogelijk te baseren op de huidige onderwijspraktijk, was het doel van dit proefschrift niet alleen om de noties verhalendheid en “stem” nauwkeurig te definiëren binnen het educatieve domein, maar ook om de toepassing ervan in hedendaagse Nederlandse educatieve teksten zorgvuldig in kaart te brengen. Hiertoe voerden we een tweetal kwantitatieve corpusonderzoeken uit: één voor verhalende elementen (hoofdstuk 4) en één voor stem-elementen (hoofdstuk 5). Voor beide studies stelden we een corpus samen van teksten voor groep 7 en vwo 2 voor de zaakvakken aardrijkskunde, biologie, en geschiedenis. Het verhalende corpus bestond uit 999 educatieve teksten; het stem-corpus bevatte 1055 educatieve teksten. Tussen beide corpora was een overlap van 980 educatieve teksten.

Onze verwachting was dat de mate waarin uitgevers verhalende en stem-elementen toepassen in hun educatieve teksten zou afhangen van de aard van de leerstof, die van zaakvak tot zaakvak verschilt. Waar geschiedenisteksten vaak specifieke gebeurtenissen, specifieke personages en hun belevenissen centraal hebben staan, richten aardrijkskunde- en biologieteksten zich eerder op terugkerende natuurverschijnselen en/of algemene processen waarbij mensen niet of nauwelijks betrokken zijn. Op basis van dit verschil in focus veronderstelden we dat verhalende elementen vaker zouden voorkomen in geschiedenisteksten dan in aardrijkskunde- en biologieteksten (hoofdstuk 4). Voor stem-elementen voorspelden we juist het tegenovergestelde (hoofdstuk 5): in geschiedenisteksten zorgen historische figuren ervoor dat leerlingen zich kunnen identificeren met de leerstof en dat zij deze leerstof

vanuit meerdere perspectieven kunnen bekijken (vgl. Bartelds et al., 2020; Hidi, 2001; Kuijpers, 2014). Dit maakt het makkelijker voor leerlingen om een beeld te vormen bij de leerstof en zichzelf hieraan te relateren. Dergelijke "bemiddelaars" zijn in aardrijkskunde- en biologieteksten over het algemeen echter afwezig, wat ertoe zou kunnen leiden dat leerlingen in deze teksten meer moeite moeten doen om de leerstof te relateren aan hun belevingswereld. Onze verwachting was dan ook dat de auteur de leerlingen in deze teksten zou helpen door als alternatieve bemiddelaar op te treden en de afstand tussen leerlingen en hun leerstof te verkleinen (vgl. Nolen, 1995).

In beide corpusonderzoeken kozen we ervoor om het vak aardrijkskunde op te splitsen in twee sub-domeinen, namelijk fysische aardrijkskunde en sociale aardrijkskunde. Waar fysische aardrijkskundeteksten zich focussen op natuurverschijnselen en/of algemene processen, zoals erosie in (6), richten sociale aardrijkskundeteksten zich op mens-gerelateerde verschijnselen, zoals migratie in (7).

(6) Het begon met een klein scheurtje in de rots. Daar kwam vocht in en op een gegeven moment wat zaadjes. Uit een van die zaadjes groeide een boom. De wortels van die boom drongen steeds verder de scheur in. En zo werd de scheur breder en dieper. Sneeuw en ijs maakten de scheur elk jaar wat wijder, doordat water uitzet als het bevriest. En toen brak op een dag dit enorme stuk rots los en knalde naar beneden…

(*Meander*, aardrijkskunde groep 7, p. 12)

(7) Migratie kan ook over grenzen gaan. Bij emigratie vertrekken inwoners naar een andere woonplaats in een ander land. Bij immigratie komt iemand een land binnen om zich daar te vestigen. De laatste jaren zijn er bijvoorbeeld veel Polen naar Nederland gekomen. Aanvankelijk kwamen zij alleen naar Nederland om te werken, maar tegenwoordig vestigen velen zich hier met hun gezin.

(*De wereld van*, aardrijkskunde vwo 2, p. 29)

Gezien het verschil in de mate van menselijke betrokkenheid in de leerstof van de twee sub-domeinen, verwachtten we dat educatieve uitgevers andere keuzes zouden maken in de toepassing van verhalende en stem-elementen. Onze verwachtingen over de verdeling van verhalende en stem-elementen over de verschillende zaakvakteksten zijn als volgt samen te vatten:

| | |
|---|---|
| VERHALENDE ELEMENTEN: | geschiedenis > sociale AK > fysische AK = biologie |
| STEM-ELEMENTEN: | geschiedenis < sociale AK < fysische AK = biologie |

Hiernaast focusten we in de corpusonderzoeken op teksten voor groep 7 en vwo 2 om na te gaan of eventuele verschillen in de toepassing van verhalende en stem-elementen tussen de vakken te generaliseren zouden zijn over verschillende leerjaren.

De corpusonderzoeken toonden aan dat verhalende en stem-elementen vrij vaak voorkomen in educatieve teksten: 45 procent van de teksten in het verhalende corpus bevatte één tot drie van de in hoofdstuk 2 gedefinieerde verhalende elementen (*N*=253). In het corpus kwamen specifieke personages het vaakst voor (*N*=293, 29%), op de voet gevolgd door een specifieke gebeurtenis (*N*=282, 28%), en de weergave van een innerlijke wereld (*N*=253, 25%). Voor alle mogelijke combinaties in Figuur 1 werden educatieve teksten gevonden. In teksten met een combinatie van twee typen verhalende elementen kwam de combinatie van een specifieke gebeurtenis en een specifiek personage het vaakst voor (*N*=87, 9%). Meer dan 10 procent van de educatieve teksten in het verhalende corpus bevatte alle drie de typen verhalende elementen en kon dus worden gekarakteriseerd als volledig verhalend (*N*=114).

Daarnaast vonden we dat stem-elementen in meer dan 60 procent van het stem-corpus voorkwamen (*N*=640). Meer dan de helft van de teksten in het corpus bevatte één tot drie verschillende typen stem-elementen (*N*=608, 58%), terwijl slechts een klein aantal teksten vier of meer verschillende typen stem-elementen liet zien (*N*=32, 3%). Het meest frequente stem-element was het direct aanspreken van leerlingen met "je"/"jij" (*N*=451, 43%), gevolgd door evaluaties (*N*=153, 15%) en vragen (*N*=149, 14%).

Beide corpusonderzoeken toonden aan dat de toepassing van verhalende en stem-elementen in educatieve teksten grotendeels de veronderstelde vakpatronen volgen. Het onderscheid tussen fysische en sociale aardrijkskunde bleek voor de toepassing van beide elementen echter irrelevant. De daadwerkelijke verdeling van verhalende en stem-elementen over de verschillende zaakvakteksten zag er als volgt uit:

| | |
|---|---|
| VERHALENDE ELEMENTEN: | geschiedenis > sociale AK = fysische AK = biologie |
| STEM-ELEMENTEN: | geschiedenis < sociale AK = fysische AK = biologie |

Deze patronen bevestigen dat verhalende en stem-elementen een verschillende rol spelen binnen educatieve teksten voor verschillende zaakvakken; waar verhalende elementen veelal voorkomen in geschiedenisteksten, worden stem-elementen vaker toegepast in aardrijkskunde- en biologieteksten.

Bovenstaande patronen bleken generaliseerbaar over leerjaar, aangezien we dikwijls geen verschillen vonden in de toepassing van verhalende en stem-elementen in teksten voor groep 7 en vwo 2. Dit suggereert dat educatieve uitgevers de toepassing van deze elementen bewust differentiëren tussen teksten voor verschillende zaakvakken, maar niet tussen teksten voor verschillende leerjaren. Het is echter voorbarig om dergelijke conclusies te trekken op basis van corpusonderzoek

alleen. Daarom was het derde doel van dit proefschrift om de intuïties en aanpak van educatieve uitgevers over het wel/niet toepassen van verhalende en stem-elementen in educatieve teksten te achterhalen.

## 3. WAAROM: uitgevers over verhalende en stem-elementen in hun educatieve teksten

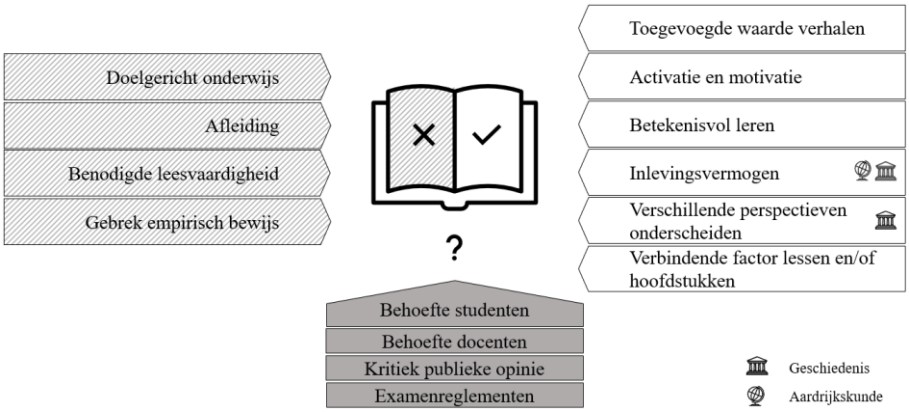
In Nederland worden schoolboeken ontwikkeld door onafhankelijke uitgevers die overheidsdoelstellingen naar eigen inzicht mogen vertalen in educatieve materialen (Bisschop et al., 2016). Hierdoor spelen educatieve uitgevers een onmiskenbare rol in de totstandkoming van educatieve teksten binnen de Nederlandse onderwijspraktijk.

In hoofdstuk 6 gingen we middels twee focusgroepen en een groepsinterview in gesprek met educatieve experts over hun intuïties en aanpak omtrent de toepassing van verhalende en stem-elementen in educatieve teksten. Deze experts waren werkzaam als (hoofd)redacteur, portfoliomanager, contentmanager en/of contentontwikkelaar bij één van de vijf grootste educatieve uitgeverijen op de Nederlandse educatieve markt. In alle drie de gesprekken werden de zaakvakken aardrijkskunde, biologie en geschiedenis door ten minste één expert vertegenwoordigd.

De gesprekken gaven inzicht in de voor- en nadelen en andere overwegingen waarmee educatieve experts rekening houden wanneer zij keuzes maken over de toepassing van verhalende en stem-elementen in hun educatieve teksten. De bevindingen uit de gesprekken worden samengevat in Figuur 2.

**Figuur 2.**

Veronderstelde voordelen (blanco), nadelen (lichtgrijs) en andere overwegingen (donkergrijs) omtrent de toepassing van verhalende en stem-elementen in educatieve teksten



De in Figuur 2 beschreven voordelen bevestigen de aanname dat educatieve uitgevers verhalende en stem-elementen inzetten als strategieën om hun educatieve teksten voor leerlingen interessanter te maken ("activatie en motivatie") en makkelijker om te begrijpen en te leren ("betekenisvol leren"). De in Figuur 2 beschreven nadelen laten echter zien dat het gebruik van deze elementen in educatieve teksten volgens de experts niet geheel zonder beperkingen is. De experts noemen als belangrijke beperking dat zij – vanwege een grotere doelgerichtheid in het onderwijs – de toepassing van verhalende elementen op gespannen voet vinden staan met de overdracht van de eigenlijke leerstof, die zij als het meest essentiële onderdeel van schoolboeken beschouwen.

De experts stellen dat de mate waarin zij verhalende en stem-elementen uiteindelijk toepassen in hun educatieve teksten afhankelijk is van het zaakvak. Waar zij de meeste waarde hechten aan verhalende elementen in geschiedenisteksten – vooral vanwege de veronderstelling dat deze elementen leerlingen stimuleren zich te verplaatsen in een andere tijd en hen helpen met een kritische blik verschillende historische perspectieven te onderscheiden (vgl. Houwen et al., 2020; Kropman et al., 2019, 2020) –, vinden de experts verhalende elementen minder belangrijk in aardrijkskunde- en biologieteksten. In die laatste teksten geven zij juist de voorkeur aan de toepassing van stem-elementen.

Deze voorkeuren sluiten naadloos aan bij de wijze waarop educatieve uitgevers deze elementen daadwerkelijk toepassen in hun educatieve teksten, zoals we in kaart hebben gebracht voor verhalende elementen in hoofdstuk 4 en voor stem-elementen in hoofdstuk 5. De bevindingen van hoofdstuk 6 bevestigen dan ook wat de corpusresultaten al suggereerden: educatieve uitgevers hanteren een weloverwogen aanpak als het gaat om de toepassing van verhalende en stem-elementen in teksten voor verschillende zaakvakken.

De bevindingen van hoofdstuk 6 bevestigen ook onze veronderstelling dat educatieve uitgevers géén weloverwogen aanpak volgen in de toepassing van verhalende en stem-elementen in educatieve teksten voor verschillende leerjaren. Het gebrek aan differentiatie in de toepassing van deze elementen in teksten voor groep 7 en vwo 2, zoals vastgesteld in de corpusonderzoeken van hoofdstuk 4 en hoofdstuk 5, wordt namelijk weerspiegeld in het ontbreken van uitgesproken intuïties en beleid in dit opzicht. De experts gaven immers aan dat de toepassing van verhalende en stem-elementen nooit wordt afgestemd tussen de afdeling van een uitgeverij die zich bezighoudt met materialen voor het basisonderwijs en de afdeling van dezelfde uitgeverij die zich richt op materialen voor het middelbaar onderwijs.

Naast de voor- en nadelen uit Figuur 2 houden de experts rekening met de behoeften van leerlingen en leerkrachten. Hoewel ze niet aarzelen over de toepassing van verhalende elementen in hun teksten als het gaat om de wens van leerkrachten om "verhalen te vertellen", zijn de experts wel enigszins terughoudend in de toepassing van deze elementen als het gaat om hun effectiviteit. Volgens de experts ontbreekt het

dikwijls aan empirisch bewijs dat bevestigt dat verhalende elementen positief bijdragen aan het lees- en leerproces van leerlingen. Deze aarzeling is begrijpelijk in het licht van de bevindingen van hoofdstuk 3, en benadrukt de noodzaak voor systematischer vervolgonderzoek.

Hoewel de experts graag zouden zien dat de door hen veronderstelde voordelen van het toepassen van verhalende en stem-elementen in educatieve teksten worden bevestigd door effectonderzoek, lijken ze er vrij zeker van te zijn dat deze elementen educatieve teksten voor leerlingen interessanter maken en daarmee ook gemakkelijker om te begrijpen en te leren. Net als bij de effecten op tekstbegrip en onthoudbaarheid is het echter onduidelijk of leerlingen educatieve teksten met deze elementen daadwerkelijk aantrekkelijker vinden dan educatieve teksten zonder deze elementen. Voor verhalende elementen lijkt het gebrek aan genre-effecten op tekstwaardering, zoals besproken in hoofdstuk 3, juist te suggereren dat leerlingen verhalende educatieve teksten niet hoger waarderen dan educatieve teksten zonder verhalende elementen. Als blijkt dat verhalende en stem-elementen niet positief bijdragen aan de tekstwaardering van leerlingen, zou dit een fundamentele reden voor de toepassing van deze elementen in educatieve teksten wegnemen.

In hoofdstuk 7 onderzochten we daarom in hoeverre de aanname van educatieve uitgevers over de aantrekkelijkheid van levendige educatieve teksten wordt ondersteund door de resultaten van een off-line leesexperiment onder leerlingen uit groep 7 ($N$=99, 46 meisjes), waarin we ons richtten op hun waardering van educatieve teksten met en zonder stem-elementen. De leerlingen lieten in het scoren van een serie teksten niet altijd een duidelijke voorkeur zien voor educatieve teksten met of juist zonder stem-elementen. Als zij echter een directe vergelijking moesten maken tussen twee versies van dezelfde tekst (met of zonder stem), dan bleken educatieve teksten mét stem-elementen de overhand te hebben. Aangezien stem-elementen nooit tot negatieve waarderingseffecten leidden, lijkt er wat betreft tekstwaardering geen reden te zijn voor educatieve uitgevers om deze elementen te weren uit hun teksten. De bevindingen van hoofdstuk 7 ondersteunen dus de aanname van educatieve uitgevers dat de toepassing van stem-elementen educatieve teksten aantrekkelijker maakt voor leerlingen om te lezen.

## 4. Conclusie

In dit proefschrift hebben we verhalende en stem-elementen gedefinieerd binnen het educatieve domein, de toepassing van deze elementen in hedendaagse Nederlandse educatieve teksten in kaart gebracht, en de beweegredenen van educatieve uitgevers voor de toepassing van deze elementen in hun educatieve teksten achterhaald. Hiermee heeft dit proefschrift de basis gelegd voor gedegen vervolgonderzoek naar de effectiviteit van verhalende en stem-elementen in educatieve teksten. Dergelijk vervolgonderzoek is essentieel om ons begrip over de toepassing van verlevendigende strategieën in educatieve teksten te vergroten en de potentie van verhalende en

stem-elementen in het ontwerp van optimale educatieve teksten te bestuderen. Daarnaast heeft dit proefschrift een aantal praktische implicaties voortgebracht voor de optimalisatie van educatieve teksten. Het belang van goed ontworpen educatieve teksten die leerstof op een aantrekkelijke en begrijpelijke wijze overbrengen, kan immers niet worden overschat.

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Nina
*December 2021*

# Curriculum Vitae

Nina Sangers was born on September 16th, 1992 in Breda, the Netherlands. After she finished her pre-university education at the Stedelijk Gymnasium Breda in 2011, she went on to study in Utrecht. At Utrecht University, Nina obtained her Bachelor of Arts (BA) in Dutch language and culture in 2014 (*cum laude*) and her Research Master of Arts (MA) in Linguistics in 2016 (*cum laude*). After her studies, Nina remained affiliated to Utrecht University as a research assistant within the AnnCor project, which focused on the creation of a repository of richly annotated Dutch text data, as well as an NRO-project on effective reading strategy teaching for and by Dutch language teachers. In 2017, Nina obtained an NWO Sustainable Humanities grant for her PhD trajectory, which she started in September of that year at the Utrecht Institute of Linguistics OTS, at Utrecht University. The current dissertation is the result of the research that she carried out during her four years as a PhD candidate (2017-2021). Alongside her PhD trajectory, Nina was a member of the Education Committee of the Netherlands Graduate School of Linguistics (LOT, October 2018 – October 2019), and contributed to the PhD Council of the Faculty of Humanities as a general member (November 2017 – June 2021) and chair (July 2018 – December 2019). Nina is currently working at Utrecht University as a researcher in a monitor project on the comprehension of Dutch government texts and as a teacher in Language and Communication.