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**OVERCOME WITH EMOTIONS:
UNDERSTANDING THE EFFECTS OF
EMOTIONAL INFORMATION IN TEXT ON
READING COMPREHENSION AND
PROCESSING**

Scarlett Child

Thesis submitted for qualification of Doctor of Philosophy in Psychology

University of Sussex

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I hereby declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature:

For Kurt and the frog

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Summary

This thesis explores the effects of emotional information about characters in text on processing. In five chapters presenting nine experiments in total, readers were presented with emotional characters that occurred either in small texts or in sentences. In the second chapter, it was investigated whether mental representations of entities in sentences are more salient and easier to retrieve due to emotional information. In the third chapter, the effects of emotional information about multiple different characters on processing were explored. The fourth chapter presents experiments on perspective taking and how perspective affects the way emotional information is processed. Building up on that, in chapter 5, it was investigated how the mood of the reader influences perspective taking when reading about emotional information. All experiments in the first four chapters used a self-paced reading method to explore effects on reading speed (reading times). Chapter 6, however, presents an eye-tracking experiment set out to explore the effects of perspective on reading behaviour in more detail and to determine *where* perspective differences arise in the text. Hence, pronoun regions (including perspective cues) across the text were analysed. The findings presented in this thesis gave evidence that readers focus more on emotional characters (that emotional characters are more salient), and that readers also engage more with (emotional) texts when they experience the situation from a personal perspective. All experiments gave evidence that readers track and use emotional information to form a coherent representation of the text.

Table of Contents

ACKNOWLEDGEMENTS	4
SUMMARY	5
TABLE OF FIGURES	9
TABLE OF TABLES	10
1. INTRODUCTION	12
1.1. MENTAL REPRESENTATIONS & SITUATION MODELS	13
1.2. CHARACTER REPRESENTATIONS	21
1.3. CHARACTER EMOTIONS.....	24
1.4. PERSPECTIVE.....	31
1.5. WHY YOU?.....	34
1.6. VALENCE AND MOOD	38
1.7. METHODS	43
1.7.1. <i>Reading Times – Self-paced Reading</i>	43
1.7.2. <i>Inconsistency</i>	45
1.7.3. <i>Mood Induction Procedures</i>	46
1.7.4. <i>Eye-tracking</i>	50
1.8. AIM AND HYPOTHESIS	53
2. REMEMBER THEY WERE EMOTIONAL – RETRIEVAL PROCESSES OF QUALIFIED REPRESENTATIONS DURING SENTENCE PROCESSING.....	54
2.1. ABSTRACT	55
2.2. INTRODUCTION	56
2.3. METHOD	60
2.3.1. <i>Participants</i>	60
2.3.2. <i>Items</i>	61
2.3.3. <i>Design</i>	62
2.3.4. <i>Word/ Sentence Ratings</i>	62
2.3.5. <i>Procedure</i>	63
2.4. RESULTS	64
2.5. DISCUSSION.....	71
2.6. CONCLUSION	74
3. MIXED EMOTIONS - THE ACCESSIBILITY OF EMOTIONS IN CHARACTER REPRESENTATIONS	76
3.1. ABSTRACT	77
3.2. INTRODUCTION	78
3.4. EXPERIMENT 3.1	82
3.4.1. <i>Method</i>	82
3.4.2. <i>Results</i>	86
3.4.3. <i>Discussion</i>	91
3.5. EXPERIMENT 3.2	95
3.5.1. <i>Method</i>	95
3.5.2. <i>Results</i>	97
3.5.3. <i>Discussion</i>	105
3.6. EXPERIMENT 3.3	108
3.6.1. <i>Methods</i>	108
3.6.2. <i>Results</i>	111
3.7. DISCUSSION.....	117
3.8. CONCLUSION	120
4. YOU'RE THE EMOTIONAL ONE: THE ROLE OF PERSPECTIVE FOR EMOTION PROCESSING IN READING COMPREHENSION	122
4. 1. ABSTRACT	123

4.2. INTRODUCTION	124
4.3. EXPERIMENT 4.1	132
4.3.1. <i>Method</i>	132
4.3.2. <i>Results</i>	135
4.3.3. <i>Discussion</i>	140
4.4. EXPERIMENT 4.2	142
4.4.1. <i>Method</i>	142
4.4.2. <i>Results</i>	144
4.4.3. <i>Discussion</i>	148
4.5. CONCLUSION	150
5. ARE YOU MOODIER THAN HER? – THE EFFECTS OF MOOD ON READING AND ENGAGEMENT WITH PERSPECTIVE	153
5.1. ABSTRACT	154
5.2. INTRODUCTION	155
5.3. METHOD	160
5.3.1. <i>Participants</i>	160
5.3.2. <i>Reading Task Items</i>	160
5.3.3. <i>Design</i>	162
5.3.4. <i>Mood Induction</i>	163
5.3.5. <i>Reading Task Procedure</i>	164
5.3.6. <i>Film Ratings</i>	164
5.4. RESULTS	165
5.4.1. <i>Mood Induction</i>	165
5.4.2. <i>Reading Times</i>	167
5.4.3. <i>Ratings of Emotions</i>	171
5.5. DISCUSSION.....	174
5.6. CONCLUSION	177
6. TRACKING YOUR EMOTIONS – AN EYE-TRACKING STUDY ON READERS ENGAGEMENT WITH PERSPECTIVE DURING TEXT COMPREHENSION	178
6.1. ABSTRACT	179
6.2. INTRODUCTION	180
6.3. METHOD	184
6.3.1. <i>Participants</i>	184
6.3.2. <i>Apparatus</i>	184
6.3.3. <i>Items</i>	185
6.3.4. <i>Design</i>	186
6.3.5. <i>Procedure</i>	187
6.4. RESULTS	187
6.4.1. <i>Eye-Movement Data</i>	187
6.4.2. <i>Emotional Responses</i>	195
6.5. DISCUSSION.....	196
7. DISCUSSION	200
7.1. SUMMARY OF RESULTS	200
7.2. IMPLICATIONS	205
7.2.1. <i>Character Representations and Emotions</i>	205
7.2.2. <i>About you</i>	208
7.2.3. <i>About your mood</i>	210
7.3. LIMITATIONS AND FUTURE DIRECTIONS.....	212
7.4. FINAL REMARKS	215
8. BIBLIOGRAPHY	217
APPENDIX	228
LIST OF EXPERIMENTAL ITEMS	228

<i>Experimental Items for Chapter 2</i>	228
<i>Experimental Items for Chapter 3</i>	232
<i>Experimental Items for Chapter 4, 5, and 6</i>	257
<i>Added Items for Chapter 6</i>	262
LIST OF FILLERS	265
<i>Fillers Chapter 2</i>	265
<i>Fillers Chapter 3</i>	268
<i>Fillers Chapter 4, 5 and 6</i>	270
QUESTIONNAIRES FOR CHAPTER 5	273
<i>Clip Rating Questionnaire</i>	273
<i>Self Assessment - How do you feel?</i>	274

Table of Figures

FIGURE 2.1. READING TIMES FOR INFORMATION TYPES AT HEAD NOUN, (+-1 SE)	67
FIGURE 2.2. READING TIMES FOR DIFFERENT TYPES OF INFORMATION AND DIFFERENT INFORMATION LOADS (HIGH/MID LOAD), (+-1 SE)	68
FIGURE 2.3. READING TIMES FOR INFORMATION TYPES AT WORD AFTER HEAD NOUN (THAT), (+-1 SE)	69
FIGURE 2.4. READING TIMES FOR INFORMATION TYPES AT REGION AFTER VP, (+-1 SE)	71
FIGURE 3.1. READING TIMES FOR EMOTIONAL MATCH/MISMATCH AND NAMES (1ST/2ND CHARACTER, +/- 1 SE)	89
FIGURE 3.2. COHERENCE JUDGEMENTS FOR EMOTIONAL MATCHES AND CHARACTER NAMES (FIRST MORE ELABORATED; SECOND LESS ELABORATED); LEFT FOR NEUTRAL, MID FOR INCONGRUENT SECOND CHARACTERS, AND RIGHT FOR CONGRUENT SECOND CHARACTERS, EXPERIMENT 3.2, (+-1 SE)	104
FIGURE 3.3. READING TIMES FOR EMOTIONAL MATCHES AND CHARACTER NAMES (FIRST MORE ELABORATED; SECOND LESS ELABORATED); LEFT FOR NEGATIVE, MID FOR POSITIVE AND RIGHT FOR NEUTRAL FIRST CHARACTERS, EXPERIMENT 3.3, (+-1 SE)	114
FIGURE 4.1. READING TIMES FOR DIFFERENT VALENCES (NEGATIVE/ POSITIVE) IN EACH PERSPECTIVE, EXPERIMENT 4.1, (+-1 SE)	138
FIGURE 4.2. SELF-RATINGS OF EMOTIONS FOR PERSPECTIVES (PERSONAL/ONLOOKER) AND VALENCES (NEGATIVE/POSITIVE), EXPERIMENT 4.1, (+-1 SE)	140
FIGURE 4.3. READING TIMES FOR MATCH/MISMATCH, PERSPECTIVE AND VALENCE, EXPERIMENT 4.2, (+-1 SE)	146
FIGURE 5.1. RATINGS OF EMOTIONS FOR MOOD GROUPS (POSITIVE/NEGATIVE), MATCH/MISMATCH, AND VALENCE (POSITIVE/NEGATIVE), (+-1 SE)	173
FIGURE 6.1. GAZE DURATIONS FOR INDIVIDUAL PRONOUN AREAS (1-14)	190
FIGURE 6.2. GAZE DURATIONS FOR PRONOUN AREAS FOR HE/SHE AND YOU PERSPECTIVE	191
FIGURE 6.3. REGRESSION PATH DURATION FOR PRONOUN AREAS BY VALENCE AND PERSPECTIVE	193
FIGURE 6.4. TOTAL DURATIONS FOR PRONOUN AREAS BY VALENCE AND PERSPECTIVE	194
FIGURE 6.5. EMOTIONAL RESPONSES FOR VALENCE (POSITIVE/NEGATIVE) AND PERSPECTIVES (YOU & HE/SHE, (+-1 SE)	196

Table of Tables

TABLE 2.1. GLM COEFFICIENTS FOR ACCURACY BY CONDITION (BARE VS EMOTIONAL AND NON-EMOTIONAL, HIGH LOAD (HL) AND MEDIUM LOAD (ML)	64
TABLE 2.2. LMM COEFFICIENTS AND EFFECTS OF INFORMATION TYPE (EMOTIONAL VS BARE AND NON-EMOTIONAL) AND NUMBER OF ADJECTIVES (MID OR HIGH LOAD) ON READING TIMES AT NP	66
TABLE 2.3 LMM COEFFICIENTS AND EFFECTS OF INFORMATION TYPE (EMOTIONAL VS BARE AND NON-EMOTIONAL) AND NUMBER OF ADJECTIVES (MID OR HIGH LOAD) ON READING TIMES AT REGION AFTER NP	68
TABLE 2.4. LMM COEFFICIENTS AND EFFECTS OF INFORMATION TYPE (EMOTIONAL VS BARE AND NON-EMOTIONAL) AND NUMBER OF ADJECTIVES (MID OR HIGH LOAD) ON READING TIMES AT VP	70
TABLE 2.5. LMM COEFFICIENTS AND EFFECTS OF INFORMATION TYPE (EMOTIONAL VS BARE AND NON-EMOTIONAL) AND NUMBER OF ADJECTIVES (MID OR HIGH LOAD) ON READING TIMES AT REGION AFTER VP.....	70
TABLE 3.1. LMM COEFFICIENTS AND EFFECTS OF EMOTIONAL MATCH/MISMATCH ON READING TIMES, PART 2, EXPERIMENT 3.1	88
TABLE 3.2. LMM COEFFICIENTS AND EFFECTS OF EMOTIONAL MATCH/MISMATCH AND EMOTIONAL/NEUTRAL CHARACTERS ON READING TIMES, PART 3, EXPERIMENT 3.1	88
FIGURE 3.1. READING TIMES FOR EMOTIONAL MATCH/MISMATCH AND NAMES (1ST/2ND CHARACTER, +/- 1 SE.....	89
TABLE 3.3. LMM COEFFICIENTS AND EFFECTS OF EMOTIONAL MATCH/MISMATCH ON COHERENCE JUDGEMENTS, PART 2, EXPERIMENT 3.1.....	90
TABLE 3.4. LMM COEFFICIENTS AND EFFECTS FOR EMOTIONAL MATCH/MISMATCH AND EMOTIONAL/NEUTRAL CHARACTERS ON COHERENCE JUDGEMENTS, PART 3, EXPERIMENT 3.1 ...	91
TABLE 3.5. LMM COEFFICIENTS AND EFFECTS OF EMOTIONAL MATCH/MISMATCH AND EMOTIONAL STATES (NEUTRAL, INCONGRUENT, CONGRUENT) OF SECOND CHARACTERS ON READING TIMES, PART 2, EXPERIMENT 3.2	98
TABLE 3.6. LMM COEFFICIENTS AND EFFECTS FOR EMOTIONAL MATCH/MISMATCH, EMOTIONAL STATES (NEUTRAL, INCONGRUENT, CONGRUENT) OF SECOND CHARACTERS AND FIRST/SECOND CHARACTER NAME ON READING TIMES, PART 3, EXPERIMENT 3.2.....	100
FIGURE 3.2. READING TIMES FOR ALL CONDITIONS: CHARACTERS WITH NEUTRAL, CONGRUENT AND INCONGRUENT EMOTIONS, MATCH/MISMATCH AND 1 ST /2 ND CHARACTER NAME, +/- 1 SE.....	100
TABLE 3.7. RAW READING TIMES MEANS FOR ALL CONDITIONS: SECOND CHARACTER EMOTION (NEUTRAL/INCONGRUENT/CONGRUENT), EMOTIONAL MATCH/MISMATCH, NAME OF FIRST/SECOND CHARACTER, EXPERIMENT 3.2	101
TABLE 3.8. LMM COEFFICIENTS AND EFFECTS FOR EMOTIONAL MATCH/MISMATCH AND EMOTIONAL STATES (NEUTRAL, INCONGRUENT, CONGRUENT) OF SECOND CHARACTERS ON COHERENCE JUDGMENTS, PART 2, EXPERIMENT 3.2.....	102
TABLE 3.9. LMM COEFFICIENTS AND EFFECTS FOR EMOTIONAL MATCH/MISMATCH, EMOTIONAL STATES (NEUTRAL, INCONGRUENT, CONGRUENT) OF SECOND CHARACTERS AND NAME (FIRST/SECOND) ON COHERENCE JUDGMENTS, PART 3, EXPERIMENT 3.2	104
TABLE 3.10. LMM COEFFICIENTS AND EFFECTS FOR EMOTIONAL MATCH/MISMATCH AND EMOTIONAL STATE OF FIRST CHARACTERS (NEGATIVE, POSITIVE OR NEUTRAL) ON READING TIMES, PART 2, EXPERIMENT 3.3	112
TABLE 3.11. LMM COEFFICIENTS AND EFFECTS FOR EMOTIONAL MATCH/MISMATCH, EMOTIONAL STATE OF FIRST CHARACTERS (NEGATIVE, POSITIVE OR NEUTRAL), AND NAME OF FIRST OR SECOND CHARACTER ON READING TIMES, PART 3, EXPERIMENT 3.3	113
TABLE 3.12. LMM COEFFICIENTS AND EFFECTS FOR EMOTIONAL MATCH/MISMATCH, EMOTIONAL STATE OF FIRST CHARACTER (NEGATIVE/POSITIVE/NEUTRAL) ON COHERENCE JUDGMENTS, PART 2, EXPERIMENT 3.3	115
TABLE 3.13. LMM COEFFICIENTS AND EFFECTS FOR EMOTIONAL MATCH/MISMATCH, EMOTIONAL STATE OF FIRST CHARACTER (NEGATIVE/POSITIVE/NEUTRAL), AND CHARACTER NAME (FIRST/SECOND) ON COHERENCE JUDGMENTS, PART 3, EXPERIMENT 3.3.....	116
TABLE 4.1. LMM COEFFICIENTS AND EFFECTS OF PERSPECTIVE (YOU/HE\SHE) AND VALENCE (NEGATIVE/POSITIVE) ON READING TIMES, EXPERIMENT 4.1	137

TABLE 4.2. LMM COEFFICIENTS AND EFFECTS OF PERSPECTIVE (YOU/HE\SHE) AND VALENCE (NEGATIVE/POSITIVE) ON SELF-RATINGS OF EMOTIONS, EXPERIMENT 4.1	139
TABLE 4.3. LMM COEFFICIENTS AND EFFECTS OF MATCH (MATCH/MISMATCH), PERSPECTIVE (YOU/HE\SHE) AND VALENCE (NEGATIVE/POSITIVE) ON READING TIMES, EXPERIMENT 4.2	145
TABLE 4.4. LMM COEFFICIENTS AND EFFECTS OF MATCH (MATCH/MISMATCH), PERSPECTIVE (YOU/HE\SHE) AND VALENCE (NEGATIVE/POSITIVE) ON SELF-RATINGS OF EMOTIONS, EXPERIMENT 4.2	147
TABLE 5.1. MEAN MOOD RATINGS PER GROUP, NEGATIVE (-3) – POSITIVE (3), (HAPPY FEET FOR POSITIVE GROUP, SOPHIE’S CHOICE FOR NEGATIVE GROUP)	165
TABLE 5.2. MEAN FILM RATINGS FOR MOOD INDUCTION FILMS (NEGATIVE (-3) – POSITIVE (3))	167
TABLE 5.3. LMM COEFFICIENTS AND EFFECTS OF PERSPECTIVE (YOU/HE\SHE), VALENCE (NEGATIVE/POSITIVE) AND MOOD (POSITIVE/NEGATIVE) ON READING TIMES FOR THE WHOLE TEXT	169
TABLE 5.4. LMM COEFFICIENTS AND EFFECTS FOR PERSPECTIVE (YOU/HE\SHE), VALENCE (NEGATIVE/POSITIVE), MATCH/MISMATCH AND MOOD (NEGATIVE/POSITIVE) ON READING TIMES FOR LAST SENTENCE	171
TABLE 5.5. LMM COEFFICIENTS FOR PERSPECTIVE (YOU/HE\SHE), VALENCE (NEGATIVE/POSITIVE), MATCH/MISMATCH AND MOOD (POSITIVE/NEGATIVE) ON SELF-RATINGS OF EMOTIONS	172
TABLE 6.1. LMM COEFFICIENTS AND EFFECTS OF PERSPECTIVE (YOU/HE\SHE), VALENCE (NEGATIVE/POSITIVE) AND PRONOUN REGION ON GAZE DURATION	189
TABLE 6.2. LMM COEFFICIENTS AND EFFECTS OF PERSPECTIVE (YOU/HE\SHE), VALENCE (NEGATIVE/POSITIVE) AND PRONOUN REGION ON REGRESSION PATH DURATION	192
TABLE 6.3. LMM COEFFICIENTS AND EFFECTS OF PERSPECTIVE (YOU/HE\SHE), VALENCE (NEGATIVE/POSITIVE) AND PRONOUN REGION ON TOTAL DURATION	194
TABLE 6.4. LMM COEFFICIENTS AND EFFECTS OF PERSPECTIVE (YOU/HE\SHE), VALENCE (NEGATIVE/POSITIVE) AND PRONOUN REGION ON EMOTIONAL RESPONSES	196
FIGURE 6.5. EMOTIONAL RESPONSES FOR VALENCE (POSITIVE/NEGATIVE) AND PERSPECTIVES (YOU & HE/SHE)	196

1. Introduction

Hercule Poirot lay awake staring at the ceiling. Why was the station outside so silent? His throat felt dry. He had forgotten to ask for his usual bottle of mineral water. He looked at his watch again. Just after a quarter-past one. He would ring for the conductor and ask him for some mineral water. His finger went out to the bell, but he paused as in the stillness he heard a ting. The man couldn't answer every bell at once.

Text comprehension is a complex process that requires readers to interpret language input, i.e. information on different levels. After having read the excerpt of Agatha Christie's *Murder on the Orient Express* (Christie, 2010, p.37), readers have already undergone multiple processes of language processing and comprehension that enable them to form a coherent picture of the situation in the text: they might imagine the night time scene on a train, in front of a *station*, and dependent on whether they are familiar with previous stories or films about *Poirot*, an image of the detective might emerge in front of their inner eye. Also, feelings of suspense or slight discomfort might emerge within the reader as a response to the troubled state of the main character.

The question of how readers interpret and comprehend information in text and, specifically, what types of information are used, and the reader's focus during comprehension, are a major interest of this research. The primary focus will be on *emotional* information and its role during text comprehension. During reading, readers gather different information about the story. For example, they most commonly learn about the setting, e.g. *where* it takes place (*the train*) and they can use this information to make sense of the story. Also, they learn about the character (the protagonist), their main characteristics and traits. All this information is used to build a coherent 'picture' of the text and to comprehend the storyline. Emotions, i.e. affective responses are types of information that are not necessarily relevant to understand the story's setting in that they do not describe a concrete place or surrounding, but they can provide a deeper insight into the protagonist's character, they can provide an interpretation of how a situation can

be evaluated and they can give an explanation for the behaviour or actions of a character. As readers comprehend the situation in text, they can use their own experiences and relate them to the situation in text and hence comprehend the emotional responses of the character. Therefore, emotional experiences of the character might evoke emotional memories or even similar experiences in the reader (without actually being on the *train*) and therefore, emotional information might help the reader to process and comprehend the text. In line with these considerations, this project aims to investigate how emotional information about a character as for example *Poirot*, affects the reader, their engagement with the text and their mental simulation (comprehension) of the story world. For the studies presented within this research project, it is assumed that emotional information, has a facilitating impact on text comprehension, due to its relatability and due to the relationship that is built between readers and characters when emotional experiences are shared or interpreted. Also, the aim is to examine factors that might play a role for the emotional engagement of readers with the text such as their own emotional state (as opposed to the state of the character) and the perspective from which the text is experienced. Their impact on reading comprehension will be assessed in behavioural (using reading time measures) as well as psychophysiological (using eye-tracking methods) experiments.

1.1. Mental Representations & Situation Models

Our research project is concerned with how readers access and comprehend narrative stories rather than expository texts. Narratives as opposed to expository texts usually invite readers to engage with and follow a plot that resembles lifelike experiences (instead of primarily exposing them to factual knowledge). As the storyline unfolds, readers do not only comprehend the words and sentences (text-based comprehension),

but they imagine the actions and situations that are described, and in doing so, they make use of their personal experiences and knowledge to draw inferences that go beyond the explicit information that is provided by the text. Therefore, narrative comprehension involves more complex processes that go beyond the process of reading and semantically analysing what is actually written as compared to the comprehension of some more factual texts. By using the information that is provided in the text, and linking this information with their own knowledge, experiences and inferences, readers build up a mental representation of the text. A large body of research is concerned with the nature of these mental representations and the processes and mechanisms that are involved when representations are established during reading comprehension.

In order to arrive at a full comprehension (i.e. a representation) of the text, readers need to run through multiple layers of comprehension processes (Kintsch, 1988). First, on a micro-level, there is the linguistic analysis of individual words and sentences. Readers decode individual words and interpret their meaning with the help of semantic memory. Relationships between these individual words are then interpreted on a syntactic level in order to understand a sentence and its structure:

Example 1.1

Hercule Poirot lay awake staring at the ceiling. Why was the station outside so silent? His throat felt dry.

For instance, in example 1.1, readers have to decode each word (e.g. *station*), and access its meaning in their mental lexicon. Moreover, they have to establish links between individual sentence elements to understand the structure of the sentence: *Hercule Poirot* needs to be interpreted as the subject of the first sentence, i.e. the one who is *laying awake*. To establish coherence and to understand a passage rather than a single sentence, relations

between elements of different sentences have to be established. For example, in order to understand the next two sentences, the second sentence needs to be interpreted as a thought of *Hercule Poirot* and for the third sentence readers need to identify that *his throat* is an anaphoric reference (also referring back) to *Poirot*. This first linguistic analysis is text-based, i.e. it comprises information that is directly provided by the text.

However, readers do not only rely on a linguistic representation of the text, i.e. they do not solely build a mental representation based on words or syntactic structures contained in the text. More importantly, readers comprehend a text by constructing a *mental model* of what the text is *about* (Garnham & Oakhill, 1996). A mental model is hence a representation of a state of affairs (e.g. an object or an event) that is referred to by the text and that includes related real-world information based on the readers' semantic connections to that state of affairs, i.e. their knowledge and experiences (Johnson-Laird, 1983).

In early models of reading comprehension, the role of personal knowledge and experience is highlighted for the construction of mental models. For example, as suggested by the Construction-Integration Model (Kintsch, 1988), the networks of information that are build up for each element within the text contain information about the text base i.e. the text itself, and also incorporate subjective associations and knowledge of the reader, i.e. knowledge that is activated during the reading process. As suggested by Kintsch and Van Dijk (1978) and Kintsch (1988) reading is a cyclical process, so that a new element of information leads to the construction of a new network and new reading cycle. Relevant information from previous cycles can be carried over into a new cycle. Networks that contain text information and associations are then linked together to form a coherent representation of the text (a text-based representation). Information from different cycles including information from the text and the readers'

personal associations (that are activated during reading) are, hence, integrated to form a more general and comprehensive representation of the text on a global (macro) level.

One major goal during reading comprehension is to establish a coherent representation of the text. Reading goals of the reader dictate what parts of the text are in focus or attended to. Therefore, the networks that are activated when readers focus on a particular part of the text are different for each individual. The Landscape Model (Van den Broek, Risdén, Fletcher, Thurlow, Britton & Graesser, 1996) incorporates a more *dynamic* view of text comprehension that accounts for individual patterns and for moment-by-moment fluctuations of activations in memory. Due to individual reading goals and memory constraints, some information might be more closely attended to, which leads to a stronger activation in memory. The Landscape Model suggests that during reading, there are constant fluctuations of activations in memory. A concept or an element within the text (e.g. one that is attended to more often or more intensely) leads to a stronger node in memory and therefore, to a more stable representation that is more easily recalled (van den Broek et al., 1996).

The idea of activation fluctuations and the idea that readers interpret and construct representations of small chunks of the text is also supported by Gerrig and McKoon (1998). They argue that information that is integrated in a certain model is not constantly available. When a new chunk of the text is processed, that is not in line with or relevant to the earlier model (e.g. *Poirot* leaving his bed and investigating where the ting came from), the information that is contained in the earlier representations becomes less accessible (e.g. the *water*). However, for example, when there is a recurrence of an element that is contained in the earlier representation (e.g. the *conductor*) and therefore the earlier representation is of relevance again, other information associated with them (e.g. the *water*) becomes reactivated and more accessible (Gerrig & McKoon, 1998). The

findings show that the level of *readiness* (Gerrig & McKoon, 1998, p.68), i.e. the degree to which information is available and accessible in memory and *ready* to use by the reader, of a representation fluctuates and that the availability of an element within those representations depends on the activation of its associated or linked elements in the same network.

Findings from the research presented so far have highlighted that, in order to arrive at a complete text representation, readers build up small representations of individual chunks of the text, establish links between different elements and networks, and integrate all the information (from prior knowledge and text-based content) to a more global, coherent representation. During the reading process, the activation of a representation and its associated information can be less or more accessible dependent on whether it is of relevance for the construction of the current representation (the representation that is read at the moment in time). Information that is consistent with the information in the prior representation is reactivated (more accessible) and its representation is reinforced and strengthened.

As previously mentioned, an important aspect of mental models is that readers construct a representation of what the text is *about* and link text elements to their background knowledge of the real-world (Garnham & Oakhill, 1996, Johnson-Laird, 1983). Information is gained from text and then integrated into a conclusive representation of the text's content and properties. When faced with the task to understand a full text, coherent connections must be drawn between different events (or situations), i.e. reader must keep track of characters, places and times. Researchers investigating discourse processes and comprehension have therefore highlighted the importance of *situation models* for text comprehension (Zwaan & Radvansky, 1998; Van Dijk and Kintsch, 1983). The situation model comprises and links the events occurring in a text to

form a coherent representation of the overall situation (Zwaan & Brown, 1996). Moreover, situation models contain an answer to the question of *why* an event happened and *how*, which enables the reader to explain causal links between states of affairs and hence to comprehend the text as a whole coherent unit.

Situation models also contain information provided by the text and additional information that is dependent on the readers' experiences and knowledge-based inferences. Inferences are pieces of information that cannot be explicitly found in the text itself, but they are implicit assumptions the reader makes about the text based on their general world knowledge to fill in information gaps, to establish coherence, and to draw the connections that are not explicitly outlined in the text. For example, readers might be informed that there is a fire, and the protagonist finds a bottle of water. When being told afterwards that the fire has been extinguished, readers can use their world knowledge about water extinguishing fire and they can make the links between the protagonist, their bottle of water and the fire. Hence, inferences are added to a situation model and help to link individual elements of text to make it temporally and causally coherent (Zwaan & Radvansky, 1998; Van Dijk and Kintsch, 1983).

Through mental simulation of the text, readers can make a wealth of text inferences, leading to a more complex and stable situation model including both text elements and elements derived from previous experiences. Narratives in particular have been found to invite readers to *immerse* themselves in the story (Zwaan, 1999a) and to experience the text as though the story was a real-world situation. Hence, in account of the link between language comprehension and previous experiences, a large body of research highlights the notion of *embodied cognition*, i.e. the comprehension through simulation in a perceptual and physical (motoric) sense, using bodily systems (Glenberg, 2011). In this view (see also *grounded-cognition*, Zwaan, 2014), meaning is established

and comprehension is enabled by establishing connections between linguistic information and bodily (physical, perceptual) experiences (Glenberg, Goldberg & Zhu, 2011). Therefore, comprehension as explained by accounts of embodied cognition is not exclusively based on the combination and interpretation of abstract or symbolic objects (Kintsch 1998), but focuses more on readers' ability understand linguistic information through the activation of sensory or motoric memories. Through this link between text and previous experiences, the mental simulation of a text situation can also enable the reader to make perceptual (Zwaan, 1999a) and emotional inferences about the text.

In reality, our experiences and our perceptions are not static, but dynamic, i.e. they are subject to change and they are dependent on factors such as our perspective or our location in time. Similar to situations we experience in reality, the simulations of a situation during comprehension are dynamic and, therefore, the situation model is affected by similar factors. As presented by Zwaan, Stanfield & Yaxley (2002) readers include momentary perceptual states (i.e. shapes) of the elements in text. For example, reaction times during a naming task were faster when the shape of the to-be-named object (e.g. an *eagle*) matched the shape of the same object described previously in a sentence (e.g. *an eagle that flies, i.e. its wings are spread out*). Pictures of objects that did not conform to the perceptual state that was suggested in the sentence and that then was included into the situation model (i.e. *an eagle with wings drawn in*) led to longer naming latencies (Zwaan et al., 2002, p. 169). Zwaan et al.'s (2002) research revealed that situation models also include detailed perceptual information that is similar to that in real life situations.

Similar to previous models of text comprehension, the construction of a situation model follows an incremental process, in which models that are constructed of individual elements are integrated into a general or global macromodel. By adding new information

to the model, previous information can be updated. As argued by Zwaan and Madden (2004), similar to the notion of van den Broek et al. (1996), information accessibility is a function of relevance, with more relevant information being more accessible in memory. New information can therefore reinforce information of a prior model, or it can be used to update (replace) older information (Zwaan & Madden, 2004).

Another proposal by researchers investigating reading comprehension through the construction of situation models is that textual information is stored along different dimensions, making the models multi-dimensional rather than one-dimensional (see event-indexing model, Zwaan Langston & Graesser, 1995). The basic dimensions along which information is monitored and stored are: *time, space, causation, motivation and protagonist* (Zwaan & Radvansky, 1998, p.167). In the quest to establish coherence, readers check new information and the new model under construction (the *current model*, Zwaan & Radvansky, 1998) against prior information (of a certain dimension) in the *integrated model* (Zwaan & Radvansky, 1998) that might or might not be in line with the new model. Information that is in line with the information that is already present in a specific dimension can be intergraded more easily in the overall model. For example, if a narrative takes place at university and a new event (described in a new sentence) refers to a lecture hall, the integration of this event into the model, i.e. comprehension, should be relatively easy. When the whole text has been processed, readers should arrive at a *complete* model that is stored in long-term memory (Zwaan & Radvansky, 1998).

Readers monitor new information along each of the five dimensions and build and update a situation model of the situation in the text. For each of the dimensions, they are able to compare or match the new features against their previous knowledge about the text's content. For our research, we focus on the emotional information as experienced by the character i.e. the protagonist and how they affect the readers' mental

representations along different dimensions. We predict that emotional information is used to establish causal relationships between text elements (causal dimension) and that is therefore extraordinarily important to understand and make sense of the actions and behaviours of the characters in text. Moreover, we suggest that emotional information allows readers to engage with and empathise with the characters (protagonist dimension). As a result, their involvement in and their understanding of the text is predicted to be stronger for emotional texts.

1.2. Character Representations

Hercule Poirot addressed himself to the task of keeping his moustaches out of the soup. That difficult task accomplished, he glanced round him whilst waiting for the next course. (p.15-16)

As argued before, readers should easily establish a mental representation of *Poirot*, and imagine him sitting on a train. Dependent on their knowledge they might integrate features of, for example, his appearance (e.g. *moustaches*) into their representation. If the reader does not have any previous knowledge about the character that goes beyond the information in the text, stereotypical features (e.g. of a *detective*) might be integrated to enhance the representation (Carreiras, Garnham, Oakhill & Cain, 1996; Zwaan, 1999c).

As readers identify *Poirot* as the main character (protagonist) of the text, they also assign particular relevance to the information that is provided about him (Black, Turner & Bower, 1979). For example, objects (e.g. *watch*) that are physically associated with the character (e.g. [Poirot] *looked at his watch...*) are processed more easily at later stages than the same objects that are not associated (Glenberg, Meyer & Lindem, 1987; Morrow, Bower & Greenspan, 1989). Previous research (e.g. de Vega, 1995) has also demonstrated

that readers mentally adopt the character's spatial position or viewpoint, with longer reading times for objects that are spatially not in the field of view i.e. visible for the character. Furthermore, readers focus on and monitor characters' goals (e.g. Bower & Morrow, 1990) and beliefs (de Vega, Díaz & León, 1997). For example, readers use goal information to make sense of a character's actions and behaviour (e.g. Bower & Morrow, 1990) and they were found to track characters' beliefs even when they had additional belief-conflicting information (de Vega, Díaz & León, 1997). Hence, previous research found evidence that readers monitor different types of information from the character's perspective. Changes with regard to the narrative point of view cause longer reading times i.e. readers prefer narrative consistency, with events told from a specific character's perspective and fixed point of view (Black et al., 1979). As shown by previous research (e.g. Morrow et al., 1989), information about the main character is of particular relevance for story comprehension as it gives readers the opportunity to construct a more insightful (as though experiencing the situation from a personal point of view) and hence more coherent representation of the text.

At the Tokatlian, Hercule Poirot asked for a room with bath. Then he stepped over to the concierge's desk and inquired for letters. There were three waiting for him and a telegram. His eyebrows rose a little at the sight of the telegram. It was unexpected. He opened it in his usual neat, unhurried fashion. (Christie, 2010, p.14)

By engaging with a character in the text, readers might build up preferences (i.e. they favour certain pieces of new information) or expectations with regard to character traits (Rapp, Gerrig & Prentice, 2001) and story continuations involving the character (see *participatory responses*, Allbritton & Gerrig, 1991) that are also included in their situation model. In a series of experiments presented by Rapp et al. (2001), readers were found to make specific inferences about a character's characteristics. Readers use

information about the character to build a *trait-model* (Rapp et al. 2001) which serves as a basis to make predictions about the characters' future behaviour and reactions. Taking our examples, readers will very quickly conclude that some of *Poirot's* characteristics are his curiousness and his neatness. Therefore, attributes such as *curious* and *neat* are integrated into *Poirot's* trait-model. Rapp et al. (2001) found longer reading times for story continuations that were not in line with a character's trait-model i.e. with the expectations readers generated on the basis of the character's traits (e.g. a situation in which *Poirot* acts as though he was *sloppy* or *careless*). Rapp et al.'s (2001) research suggests that readers monitor character information particularly closely and that they use the information to make sense of the story world. Also, the authors have shown that readers develop preferences towards text continuations that are in line with the characters' traits and with the information that is already included within the mental representation.

Readers not only generate preferences towards story continuations that are in line with certain traits of the character, but they also develop preferences towards positive story outcomes for the character (Allbritton & Gerrig, 1991). These researchers found that when readers received additional information about the situation so that a negative story ending (from the perspective of the character) was preferable, even against readers initial anticipation of a positive outcome, reading times were delayed at the time the outcome was revealed. For example, readers were presented with a situation in which *Poirot* was invited to an old friend's dinner party, but he was running late and likely to miss it. The reader's initial response (see *participatory responses*; Allbritton & Gerrig, 1991) would be to hope for an outcome in which *Poirot* manages to get to the dinner. However, readers might be told, that the dinner is a trap with plan to take revenge on the detective. As a consequence, readers might change their preference towards a partly negative outcome, that *Poirot* will miss out on the dinner. Allbritton and Gerrig (1991)

found that when readers were induced with a negative preference (that *Poirot* will miss the dinner) reading latencies for the actual verification of any outcome (positive or negative) were delayed. It can be assumed that the additional information (i.e. about the trap) leads to a conflict of preferences in the reader, as from the character's point of view, the positive outcome is still preferable (getting to the dinner) whereas for the reader, there is also the preference for a negative outcome (to miss the dinner). The findings (Allbritton & Gerrig, 1991) show that reading comprehension is affected by personal preferences of individuals. Moreover, the research shows that readers engage with text '*through the eyes of the character*', which causes them to form preferences towards positive story outcomes from the character's point of view.¹

1.3. Character Emotions

Watson (2000) defines emotions as *organized, highly structured reaction[s] to the needs, goals, or survival of the organism* (p.3). According to this definition, emotions are an individual's vital responses to its surrounding in relation to its most essential life values. Watson (2000) further defines four major components of an emotion: a *form of expression*, a *consistent autonomic change*, a *subjective feeling* and a form of *adaptive behaviour*. Different forms and combinations of these four components lead to different emotional responses. When observing another individual experiencing an emotion, cues given from any of these four sources are interpreted and can help to identify the experienced emotion.

¹ The research presented in this review applies to and used texts in which readers are able and intended to sympathise with the character. Readers' preferences and expectations might however differ for texts including antagonistic characters or characters that are intended to be disliked. For our research, the focus will be on relatable, non-antagonistic characters (as investigated by previous research).

Poirot drank a glass of water and composed himself to sleep. He was just dropping off when something woke him. This time it was as though something heavy had fallen with a thud against the door. He sprang up, opened it and looked out. Nothing.

When processing this part of the novel (Christie, 2010, p.39), readers might imagine *Poirot* jumping *alarmed* and *troubled* out of his bed. The text provides information about the situation and behavioural cues that help the reader evaluate the valence of the situation and *Poirot's* emotional state. Readers might even feel similarly alarmed when imagining the situation. The understanding of emotional states is an important part of text comprehension. Readers monitor and represent the emotions experienced by the main protagonist (Gernsbacher, Goldsmith & Robertson, 1992). Also, when readers identify with a situation in text and when they have experienced a similar situation before and that situation evoked a certain emotional state, they are able to use their personal emotional knowledge and include the emotional state in their mental representation of the text (Gernsbacher & Robertson, 1992).

In a series of experiments, Gernsbacher et al. (1992) tested whether readers represent emotional information about the main protagonist in a short passage. First, individuals were presented with short passages that described a character in a situation that would evoke an emotional response in the real world (similar to the one with *Poirot* above). As predicted by Gernsbacher et al. (1992) this implicit description of an emotional situation should trigger emotional inferences about the character (from personal knowledge) and to include this information in their situation model. In order to test this assumption, reading times were measured for a final target sentence that included an explicit emotion that either matched (ex. 1.2a) or mismatched (ex. 1.2b) the implicit emotion of the representation:

Example 1.2

- a. *Troubled, Poirot went back to bed.*
- b. *Enthusiastic, Poirot went back to bed.*

In line with their predictions, Gernsbacher et al. (1992) reported that readers needed longer to process emotional mismatches in the target sentence, as the explicit emotion word is not in line with the emotional inference that was made about the character and so the new information cannot be integrated with the previous information contained in the representation. The studies by Gernsbacher et al. (1992) show that readers make emotional inferences about the character and that they include emotional information in their mental representations during reading.

As argued by Gernsbacher et al. (1992), the emotional representations of readers include specific emotions as they found mismatch effects when the explicit emotion word shared the overall valence of the text, but was not in line with the specific emotion of the inference (e.g. negative: *Upset, Poirot went back to bed.*). Gernsbacher et al.'s (1992) findings were, however, contested by more recent research conducted by Gyga, Oakhill and Garnham (2003). In similar experiments to the ones presented by Gernsbacher et al. (1992), involving texts with implicit emotional information followed by target sentences with different explicit emotions, Gyga et al. (2003) revealed that readers make more general emotional inferences on the basis of shared emotional properties, rather than making specific inferences that are related to or represented by only one emotion. In their experiment, target sentences included explicit emotion words that either mismatched (e.g. *enthusiastic*), matched (e.g. *troubled*), were synonyms of the matching emotion (e.g. *perturbed*), or had the same valence as the matching emotion (e.g. *dissatisfied*). Gyga et al. (2003) found mismatch effects only for mismatching emotion words, but not for synonyms or emotions with similar characteristics to the emotional matches. Their

findings show that readers include a pool of emotional properties i.e. a general emotional valence into their mental representations, but not a specific emotional term.

A character's emotion can change rapidly in the context of the story events. Therefore, in order to be able to use emotional information as a tool to make sense of the story world (i.e. the actions and behaviours of or events in relation to character) readers need to keep up with emotional changes and include new emotional information in their representation. This *updating process* was more closely investigated by de Vega, León & Díaz (1996). The authors used a similar paradigm to Gernsbacher et al. (1992) and Gygax et al. (2003) in order to examine updating processes and the accessibility of mental representations of the character's emotions. Their experiments again included passages with emotional content (implicit) as well as a target sentence with an emotional match or mismatch (explicit). In addition, their design included a second part as a continuation of the text (see example 1.3), that either gave similar emotional information to the first part (ex. 1.3a), or that provided new information suggesting an emotional change in the character (ex. 1.3b):

Example 1.3

- a. *Back in bed, Poirot couldn't stop thinking about the strange noises and stayed wide awake.*
- b. *Back in bed, Poirot started thinking about the peaceful landscape outside and slowly dozed off.*

Following the second part, another target sentence with an emotional match or mismatch was presented. De Vega et al. (1996) found that mismatch effects after the second part were mitigated when the emotional information of the second part was different to the information in the first part. The authors argued that when new emotional information is processed, older emotional information is updated so that previous emotions are less

accessible. Whereas, when continuations of the text are in line with the previous emotional information, their representation is strengthened leading to greater (easier) accessibility. For emotionally neutral continuations (second parts), the researchers found similar mismatch effects to texts that do not include any continuations. This finding suggests that emotional information remains accessible throughout the text and that it can be reactivated at later stages to make sense of the more *global* context (de Vega et al., 1996). De Vega et al. (1996) concluded that readers update their mental representations of emotional information along with new information provided by the text, that they are able to react to and track emotional changes within characters and that emotional information is held accessible to construct a global and coherent situation model.

Emotions of a character are hence a fundamental element of text comprehension, affecting character representations and situation models and, thus, comprehension processes overall. For researchers, emotions do not comprise a separate narrative dimension (see event-indexing model, Zwaan et al., 1995; Zwaan, 1999b), due to their close relationship to other dimensions such as the character's *goals* (Zwaan, 1999b). Achieving a goal, a character might feel *happy* or *satisfied* (e.g. *Poirot* convicts a murderer). In addition, emotions experienced by characters might lead them to perform certain actions or to change their behaviour. Therefore, emotions are also useful for identifying causal relationships during comprehension (Graesser, Millis & Zwaan, 1997). For example, *Poirot smiling or toasting his success* can be causally linked to his goal, *to find the murderer*, and explained by a positive emotional response to this achievement. Hence, even implicitly, emotions can serve as building blocks between several events in a text as they can fill in gaps of information by giving reasonable explanations for a character's actions and behaviour (Kneepkens & Zwaan, 1995).

In addition to their effect on readers' text comprehension, emotions are also important for the reader's engagement with text (Mar, Oatley, Djikic & Mullin, 2011; Cupchick, Oatley & Vorderer, 1998). As readers experience the text from a character's perspective, the character's emotions can evoke emotional responses within the reader. Cupchick et al. (1998) instructed readers to either imagine themselves as the character in the text, or as spectator of the situation. The researchers found that readers experienced different types of emotions in response to the text, dependent on whether they identified with the character or not. Readers reported more *fresh emotions* (new emotional experiences in response to the text) as they assumed the role of the character. On the contrary, they responded to the spectator role with more *emotional memories*, connected to readers' personal experiences. Hence, emotions of characters have been found to be relevant for the reader's own personal experience of the situation in text (see also perspective below) and they are an interesting factor influencing the readers' responses to text.

Previous studies have stressed the role of emotional information for comprehension, however, to our knowledge, research yet has to demonstrate that emotional information has processing benefits over non-emotional information. De Vega et al. (1996) have tested processing of emotional texts and shown that emotional information captures the reader's attention and is easily accessible in later processing stages (even when interrupted by neutral information). However, to our knowledge, research has not yet established a direct comparison between comprehension processes of texts including emotional and non-emotional (neutral) information. If the retrieval of emotional information is easier (as the representation is more accessible, de Vega et al., 1996) than the retrieval of neutral representations, processing times should be faster (and for emotional representations than for non-emotional representations. This prediction was

examined in our first series of studies. For both experiments, we used sentences involving a character (referred to by a descriptive noun, e.g. *the detective*) for which either no additional information, non-emotional information (e.g. *the tidy detective*) or emotional information (*the moody detective*) was provided. Retrieval latencies were measured at a later stage of the reading process, when the noun had to be retrieved in order to make sense of the sentence (Hofmeister, 2011; Van Dyke & McElree, 2006; Grodner & Gibson, 2005). We predicted that a more complex representation (including any kind of information) is more easily retrieved (accessible) than a simple (more generic) representation (without additional information) (Hofmeister, 2011; Zwaan, 1999a). In addition, and due to ease of access, representations including emotional information should be more easily retrieved than non-emotional representations (or representations without additional information).

In order to assess the importance of emotional information in a more global sense, we then turn from the processing of single sentences to the comprehension of more complex passages. As predicted by previous literature, readers track and update emotional information about the protagonist. Researchers so far have highlighted the role of the protagonist during text comprehension and studies involving emotional representations have primarily tested the readers' ability to track and update emotional information in relation to a *single* main character (e.g. *Poirot*). However, as argued by Oatley (1999), narratives commonly introduce and include information about *multiple* characters. One of our set of studies will therefore address the question as to whether readers track emotional information for multiple characters in text and whether they prefer information that is congruent with (the representation of) a more elaborated character (e.g. the protagonist). Hence, in two experiments, we tested comprehension processes for texts including emotional information from the perspective of *multiple* characters.

1.4. Perspective

The American was succeeded by the pale Englishman with the inexpressive face whom Poirot had already noticed on the day before. He stood waiting very correctly. Poirot motioned to him to sit down. (Christie, 2010, p.90)

As hinted earlier, readers experience a text from the viewpoint of its main character and their emotional responses to text might change as a function of their identification with the character (Mar et al., 2011; Cupchick et al., 1998). Previous research has provided evidence that readers take the character's perspective in a spatial (Zwaan, Madden, Yaxley & Aveyard, 2004) as well as in a mental sense (de Vega, 1995; de Vega et al., 1996; Albrecht, O'Brien, Mason & Myers, 1995).

Assuming that, with regard to the passage above, *the Englishman* follows *Poirot's* instruction to sit down, readers might imagine a motion of *the Englishman* walking or coming closer towards *Poirot*. As readers are likely to assume *Poirot's* perspective, this movement *towards* or approaching the character should include the perception of the man becoming larger in the representation of the reader (due to their spatial awareness, Zwaan et al., 2004). Zwaan et al. (2004) demonstrated that readers are able to monitor these spatial relationships between narrator and objects during narrative comprehension as though experiencing the situation from the character's point of view. The authors first presented sentences to individuals that included spatial movement (e.g. *The man approached Poirot*). The sentences were followed by two pictures that displayed the object referred to in the sentence (or a different object for distractor items). In the second picture objects were either larger or smaller than in the first picture. In a subsequent decision task, individuals were asked to judge whether the object in the sentence corresponded to the object shown in the pictures. Reaction times (for matching objects between sentence and picture) were slower when the size of the object in the second picture (e.g. *the Englishman is smaller* in the second picture than in the first) did not

correspond to the spatial movement suggested by the sentence (e.g. *The Englishman approached Poirot.*) i.e. when the motion did not correspond to the spatial representation of the reader. Zwaan et al. (2004) concluded that readers represent the situation in text dynamically, i.e. they include spatial movements, and that readers perceive these movements from the character's perspective.

For our research, we assume that readers assume the perspective of the protagonist, however we do not focus on spatial simulation, but the mental simulation of events in text, especially with regard to the character's feelings and emotions.

A study by Albrecht et al. (1995) investigated whether readers represent the character's goal from their (the character's) perspective. Text passages included information about a character and their goals. Passages also gave information about whether the character's goal was either not yet achieved or already achieved. In a first experiment, readers were asked to read and comprehend the text without additional instructions. Reading times for passages were found to be similar for already achieved goals and not achieved goals. The findings of Experiment 1 suggest that readers did not adopt the perspective of the character and that they did not focus on the character's goal, but that they made use of their personal knowledge of the text (i.e. the inferences drawn from other text elements, unknown to the character). This finding was, however, different in two subsequent experiments, in which readers were explicitly instructed to take the perspective of the main character. In Experiment 2 and 3, effects of goal achievement (achieved or not achieved) were found, with shorter reading times for (more focus on) goals that had not been achieved yet. The authors concluded that readers only take the character's perspective when explicitly told to do so and that by taking the perspective of the character, they do not rely upon their general knowledge of the text, but on text elements known by and in the focus of the character, their unachieved goals in particular.

For our project, the findings by Albrecht et al. (1995) are interesting, first because they clearly show that processing is affected by the mental perspective of the reader and second, because they indicate that readers need to be explicitly ‘told’ to assume this perspective. For our project, our aim is to investigate readers’ engagement with emotional texts. This emotional engagement may, similarly to readers’ engagement with the characters’ goals (Albrecht et al., 1995), be dependent on whether reader actually experiences the situation from the character’s point of view. With this in mind, the question arises of *how* readers can effectively be instructed to take the position of the narrator. In Albrecht et al.’s (1995) research procedure, readers were explicitly told to imagine that they were the character in advance of the reading task. However, another more implicit approach to prompt readers to change or assume a certain perspective via the text itself is the use of pronouns.

Most commonly, readers experience a narrative through a character presented in the third person perspective:

There was only one occupant at the moment, obviously the young English lady referred to by the conductor. [...] M. Hercule Poirot, having nothing better to do, amused himself by studying her without appearing to do so. She had poise and efficiency. He rather liked the severe regularity of her features and the delicate pallor of her skin. He liked the burnished black head with its neat waves of hair, and her eyes, cool, impersonal grey. But she was, he decided, just a little too efficient to be what he called ‘jolie femme’. (Christie, 2010, p.8)

Characteristically in this perspective, the main character (i.e. the protagonist) is referred to either by his or her name (e.g. *M. Hercule Poirot*) or by pronouns, *he* or *she*, dependent on the character’s gender. As in the paragraph above, readers ‘see’ through the eyes of the character, for example, they learn about the lady’s appearance from the description of the subjective (and not always reliable) viewpoint of the character. For instance, *Poirot’s* impression of the *lady* and his final judgment affect the readers’ representation (of *the lady*). However, this representation might be false, or it might differ

significantly from the representation the *reader* would construct if he or she experienced the situation *him/herself*. Readers might partly identify with or empathize with the character. However, they are aware that the character possesses their own identity, and that its character representation is distinct from the reader's representation of the *self* (Schofield, 1998). In order to take the perspective of the character, the distance that is created between the *self* (the reader) and the character should be minimized so that the information that is relevant for the character *in text* also becomes personally relevant for the reader.

1.5. Why you?

I ask what you feel, what you thought. (Christie, 2010, p.151)

Literary theorists propose that a special rapport between the character and the reader can be constructed through the use of the second person perspective involving the pronoun *you* (Richardson, 2006, Schofield, 1998, McHale, 1995, Phelan, 1994, Kancandes, 1993). Considering the sentence above without further context, readers might face the challenge of deciding whether *you* refers to themselves i.e. whether the narrator demands *their own* feelings and thoughts or whether *you* refers to another character in the text. This ambiguity can easily be resolved by the context. For this example, this sentence is an utterance of *Poirot* during a conversation with a witness who is addressed as *you*.

In contrast to other pronouns, *you* is more ambiguous in its spectrum of reference (Schofield, 1998). *He* or *she* most commonly refer to specific person or character within the narrative whereas *I* usually constitutes a self-reference to the narrator. *You*, however, in its different forms might refer to the narrator or author him/herself, to another character, to a narratee or to the reader. It has the function to designate (and divide) the narrator and

the narratee. In contrast to other pronouns, the *you* perspective is able to draw the reader into the narrative:

[...] *the reader knows that he or she is extradiegetic, outside the narrative, and only assumes identity with the main character as part of the act of play in which reading consists.* [...] [The author's] *strategy is to catch you, the extradiegetic reader, off guard, and make you the subject of diegesis, thereby spiriting or abducting you into the narrative.* (Kirby, 1992 in Richardson, 2006, p.31)

The quote by Kirby (1992) highlights the fact that readers are aware that they are not an active part of the text (i.e. that they are not identical to the main character), However, through the use of the pronoun *you* they become or act as a part of the narrative (McHale, 1995). As remarked on by Phelan (1994, in Schofield, 1998) a more detailed characterization of the *you*, leads to a stronger dissociation between the reader and the *you*, as it becomes harder to identify with the representation of the *you*. However, more generally, by addressing the reader as *you*, a dialogue between the narrative and the reader is established, and the reader is inscribed in the story world (Schofield, 1998). Due to the appellative force of the *you* the reader is called to fill the position of the protagonist (Schofield, 1998), to mentally perform the action that is described in the text (Kancandes, 1993), and experience the text from the protagonist's perspective (Silverman, 1993). For the reader, the use of the *you* perspective is a '*seduction to feel addressed and a realization that the call is not quite accurate*' (Kancandes, 1993, p. 170).

Considering the literary function and the special role of the pronoun *you* to assign the reader as the experiencer of the text, that reader might be more included into the narrative as distance between the text and the reader is reduced. We assume, that the *you* functions as a *bridge* between the representation of the *self* (the reader) and the protagonist, and that it might act as a prompt for readers to take the perspective of the

protagonist (similarly to an explicit instruction) and, therefore, that the mental simulation of situations in the text is facilitated.

To our knowledge, very few experimental studies have made use of or examined the role of pronouns when investigating perspective taking and text comprehension processes. In a first series of experiments, Brunyé, Ditman, Mahoney, Augustyn and Taylor (2009) tested whether the use of different pronouns can prompt readers to adopt an *internal* (adopting or simulating the situation from the character's point of view) or *external* perspective (adopting an onlooker perspective, i.e. monitoring the character performing an action or event; Brunyé et al., 2009). Individuals were first presented with sentence outlining an event from the first (*I*), second (*you*) or third (*he/she*) person perspective, for instance: *He is slicing a tomato*. After reading, in a decision task they were asked to judge whether the action performed in the sentence corresponded to the action displayed in the picture that was shown to them. Pictures either displayed the actions from an *internal* perspective, as though looking onto one's own hands *slicing a tomato* (arms/hands at bottom end of the picture), or from an *external* observer perspective, as though looking at someone else's hands *slicing a tomato* (arms/hands at top end of the picture). Brunyé et al. (2009) reported that judgement times were faster for pictures showing the *external* perspective for sentences including the pronouns *he* or *she*. However, participants reacted more quickly when sentences including the pronouns *I* or *you* were followed by a picture displaying the *internal* perspective. In a second experiment, two discourse sentences were added (preceding the sentence with the main event), so that more information about the character was provided. Findings were similar for sentences including the pronouns *he/she* (processing benefits for pictures in the observer perspective) and *you* (benefits for pictures from the personal perspective).

However, additional information hindered the reader's identification with the character in the first person *I* perspective.

As empirically demonstrated by Brunyé et al. (2009), the *you* perspective seems to be the only perspective that (stably and automatically) engages the reader personally with the situation in text, and for which readers construct situation models that include the events in text as though they are experienced by themselves (from their own perspective). In a later experiment, Brunyé, Ditman, Mahoney and Taylor (2011) elaborated on their previous findings by testing the quality of mental representations of texts that were written from either the *you* or the *I* perspective. After reading short passages that were either written from a first (*I*) or second (*you*) person point of view, readers answered comprehension questions testing their knowledge along different comprehension dimensions (see *event-indexing model*, Zwaan Langston & Graesser, 1995). In addition, readers were asked to rate their affective responses to the text to reveal whether the simulation of the character's emotions was affected by perspective. Brunyé et al. (2011) reported more accurate memory in the *you* perspective only for questions about the spatial dimension. Moreover, readers' emotional responses were stronger and more in line with the valence of the text when emotional information was provided in the *you* perspective. Results reflect that due to a more *vivid and internalized* (Brunyé et al., 2011) simulation of the events in text from a *you* perspective, readers engage more strongly with the emotional and spatial content of the story. This engagement leads to more stable representations that can easily be retrieved. The findings of Brunyé et al. (2011) are in line with previous research suggesting that spatial and also emotional information are particularly affected by the reader's ability to imagine a situation from the perspective of the character. In addition, Brunyé et al.'s (2011) research clearly demonstrated that personal engagement with the character's perspective affects mental

representations of emotional (and spatial information) and their saliency (ease of access) in memory.

Similarly to Brunyé et al. (2011), we are interested in whether mental representations of specifically *emotional* information can be affected by the reader's personal engagement with the text. However, in contrast to the experiment conducted by Brunyé et al. (2011), our focus is not on memory performance or the reflection of emotional responses *after* comprehension. One question that is addressed in this thesis asks how readers use perspective and the emotional information in text to build up mental representations *during* comprehension? Therefore, in another set of studies, it is investigated whether the processing (as opposed to retrieval) of emotional information in text is facilitated when readers experience the text from the personal *you* perspective? Also, it is examined whether emotional representations that are the result of a more personal engagement with the situation in text are more accessible when trying to understand new pieces of information that occur later in text.

1.6. Valence and Mood

So far, we have discussed different factors that affect language processing, especially the processing of emotions in text. We argued that there are multiple aspects that influence the comprehension of emotional information and the construction of emotional representations from *within* (implicit versus explicit information, information about the protagonist, about a single character or multiple characters, pronoun use for perspective) or *beyond* the scope of the text (reader's knowledge and experiences or reading instructions).

In addition to the aspects addressed previously, some studies concentrate not only on the emotional information within the text, but on the readers' emotional state during

the reading process. Some studies (e.g. Brunyé et al., 2011) include tests that ask readers to evaluate their own emotional responses after reading a text. For these types of responses, it is interesting to see whether the emotions indicated by the reader are in line with the emotions portrayed in the text. Depending on their engagement with the text, a positive emotional valence within the text (i.e. positive emotions of the character) should lead to more positive responses within the reader and similarly for negatively valenced text emotions. Therefore, it can be assumed that there is an emotional transfer from the character to the reader, in particular when the reader engages with the text and identifies with (takes the perspective of) the character. For instance, when reading about *Poirot* being *happy* (positive emotional valence) about finding the murderer, readers should also experience some degree of happiness (in the form of positive emotional responses).

The findings of Brunyé et al. (2011) demonstrate that emotions in the text affect the reader's emotions. However, little is known about the opposite direction of the transfer i.e. how the readers' emotions affect their processing of emotional information about characters and their resulting representation of that information. Some researchers have explored the impact of mood (of the reader) on language processing more generally. In particular, researchers have been interested in congruency effects between the reader's mood and the valence of the text (Bower, 1981; Havas, Glenberg & Rinck, 2007; Egidi & Nussbaum, 2012). In his review, Bower (1981) summarized and presented research exploring mood congruency effects. Bower (1981) concluded that *people attend to and learn more about events that match their emotional state* (p.147). Also, memory for story events that are in line with readers' emotional states was suggested to be improved due to the saliency of mood-congruent stimuli (Bower, 1981, p.142)

In his review, Bower (1981) focused primarily on the effects of mood congruency on memory and recall of story events. Some more recent studies have highlighted the role

of mood congruency during processing and for the evaluation of (or reflection on) emotional representations. For example, Havas et al. (2007) tested whether readers whose physical (facial) expression resembled a smile (associated with positive emotions) boosted their ability to identify positive valences in text and whether the opposite trend could be found for participants mimicking negative facial expressions. Their research built on findings proposing that the imitations of facial expressions (e.g. a smile) can lead to similar physical responses (Levenson, Ekman & Friesen, 1990) and to activations of similar neural systems (Rizzolatti, Fogassi & Gellese, 2001) corresponding to the emotion connected to the expressions (e.g. happiness). In order to physically imitate a certain emotion through their facial expression Havas et al. (2007) used a method that was first presented by Strack, Martin and Stepper (1988). Participants were asked to hold a pen either between their teeth (resembling muscle movements of a smile) or between their lips (resembling muscle movements of a frown). After reading sentences with positive and negative valences, participants were asked to judge whether the sentence was pleasant or unpleasant and in a second experiment whether the sentence was difficult or easy to understand. Havas et al. (2007) found that judgment times were faster when the valence of the sentence was in line with the facial expression of the participant. As this finding could not be replicated in an additional experiment using emotionally charged words (rather than sentences), the authors argue that the simulation of emotions is affected by mood during text comprehension but that it does not affect lexical processing.

Similar to Havas et al. (2007), Egidi and Nusbaum (2012) investigated congruency effects during language comprehension. However, their focus was not on the mood effects on judgements *after* the reading task, but they explored how mood affects reading processes *during* comprehension. Also, in contrast to the previous study, participants did not physically imitate emotional expressions, but they underwent a mood

induction prior to the experiment (see discussion of Mood Induction Procedures). Negatively and positively induced participants were also compared to a neutral control group (no mood induction). Individuals listened to full stories that either had a negative or positive story outcome. Egidi and Nusbaum (2012) analysed ERP components during the processing of story endings. The researchers reported higher amplitudes of the N400 component for emotions that were incongruent between listeners and story endings compared to emotional matches. The N400 is a component that is associated with the semantic analysis and integration during processing. Higher amplitudes are indicative of integration errors or processing difficulties (Egidi & Nusbaum, 2012; Kutas & Federmeier, 2011). Therefore, the results reported by Egidi and Nusbaum (2012) indicate that processing and the integration of new information during story comprehension is more difficult when the emotional information of the story does not correspond to an individual's own emotional state.

In this project, it is examined whether the mood effects reported by Egidi and Nusbaum (2012) are also relevant for reading comprehension, and whether the mood of readers influences their reading behaviour and ease of processing. As argued above, mood congruency with the text seems to be one factor that specifically affects the reader's ability to integrate new emotional content. Another aspect that might affect how readers process emotional information is their comprehension or processing strategy, which is predicted to differ as a function of mood (e.g. Bohn-Gettler & Rapp, 2011; Schwarz & Bless, 1991). A large body of research (e.g. Park & Banaji, 2000; Schwarz & Bless, 1991) suggests that information processing and an individual's attention to details is mood-dependent, with negative mood states leading to a more analytical engagement with new information. Individuals in a negative mood tend to concentrate more on details and rely on a careful examination of new information first, because the processing task might be

evaluated as an opportunity to distract from the negative situation, and second because individuals might analyse new information to determine its suitability to change their negative mood towards a more positive mood state (Schwarz & Bless, 1991). In contrast, individuals in a *safer*, positive mood state are less perceptive of the potential threat imposed by new negative information on their mood state and tend to revert to riskier (Schwarz & Bless, 1991, p. 67) heuristic processing strategies.

For the scope of this thesis, the main interest is whether the finding that processing strategies vary as a function of mood is also applicable for strategies used for reading comprehension. For the study of Bohn-Gettler and Rapp (2011) participants induced with different moods (neutral, positive and negative) were asked to read stories and record their own understanding of the text via a think-aloud protocol during comprehension. Moreover, they were asked to summarise the text after the reading task. Bohn-Gettler and Rapp (2011) reported that participants with negatively and positively induced moods recalled more relevant information and were able to paraphrase more than participants with neutral induced moods, and that positively induced participants were able to make more text-based inferences than participants induced with a negative mood. These results indicate that mood affects reading strategies in such way that, in a neutral mood, readers adopt an entertainment strategy (less focused on and poorer memory for text-relevant information). As argued by the authors, fewer inferences in the negative mood group are the result of fewer connections between relevant information. Hence, comprehension strategies and the focus on particular types of information that are used to comprehend the text seem to be affected by the readers' personal emotional state.

Given previous findings on mood effects for language comprehension and processing, we assume that the mood of the reader might be an important factor to consider when investigating the effects of (character) emotions on reading processes. We

will explore these effects *during* comprehension i.e. during a reading task and examine whether processing is easier and comprehension is faster when readers and characters share similar emotions (emotional valence, at least, Egidi & Nusbaum, 2012; Havas et al. 2007). Based on the findings of Bohn-Gettler and Rapp (2011) and Schwarz and Bless (1991) it will also be investigated whether readers induced with different mood states focus on different aspects of the text i.e. whether a certain mood makes them more or less likely to be affected by perspective changes or by semantically incongruent information within the text.

1.7. Methods

1.7.1. Reading Times – Self-paced Reading

For most experiments in this thesis we use a self-paced reading method in order to assess reading times. The self-paced reading method is one of the simplest and most common ways to monitor reading and comprehension processes *as they happen* (i.e. in *real-time* or *during* processing; Jegerski, 2014). The self-paced reading method has been used by psycholinguistics since the 1970s, and has contributed to major research findings about the way we process language. In contrast to fixed-paced methods in which the researcher determines for how long a segment is displayed, self-paced reading is close to natural reading (Jegerski, 2014; Mitchell & Green, 1978), in that participants can read at their natural speed, which provides information not only about individual differences in reading times, but also about *processing* differences between different reading conditions.

For the presentation, sentences, or larger units, are often split into smaller segments (dependent on the task or the study's focus). For our project, segments were either single phrases (for sentence processing), single sentences or single passages (consisting of multiple sentences, or words for the first set of experiments). Settings and

designs of the self-paced reading task can vary from study to study and can be adjusted to research aims. For example, segments can be presented separately (individually), and replace or add to previous segments. As its name suggests, reading or display latencies are usually not fixed or predetermined by the researcher, but depend on the reader (Jegerski, 2014). After having read a segment, participants give a prompt or a response before proceeding to the next segment. Most commonly, responses are given via a button press, for example on the keyboard, a button box or a rumblepad. The time between the onset of the segment's display and the button press is recorded as the reading time for the segment. Just and Carpenter (1980) (see also Rayner, 1998 for review) argue that reading times are equal or similar to processing times, which makes the recorded times a valid indicator of comprehension processes and an appropriate measure for processing differences between conditions that might reflect ease of processing or processing difficulties.

The display of segments can be either *cumulative* or *noncumulative* (Jegerski, 2014). In the cumulative display, segments remain visible after the participant's response has been given, so that the new segment is added to previous one, and, at the end, all segments of a single stimulus are on display. In the noncumulative version, a single segment disappears after the participant's response, and the next segment is displayed individually. The cumulative display is closer to natural reading as readers are being given the chance to look back to previous information. However, a problem with the cumulative presentation is that participants might quickly run through individual segments (without processing them) in order to arrive at the full display (Jegerski, 2014; Ferreira & Henderson, 1990), which might make reading times for individual words or sentences uninterpretable. We therefore decided to use the noncumulative display method for our studies.

1.7.2. Inconsistency

This project aims to investigate whether readers build up a more or less stable representation of the text in response to specific types of information (i.e. emotions) and whether the presentation of some information is more easily integrated than for other types of information. Therefore, a reliable method to assess the nature and saliency of mental representations needed to be found for some of the experiment reported in this thesis. Previously two experiments were reported that explored whether readers include emotional information in their mental representations (Gygax et al., 2003; Gernsbacher et al., 1992). Both studies made use of a paradigm that allows for a comparison between the ability to integrate consistent or inconsistent information with a previously established representation. The effects of semantic inconsistencies between text elements are commonly examined in language comprehension studies as they can help to identify whether readers were able to successfully process and comprehend previous text information and whether they are able to integrate new information along with their previous knowledge (from experience or text, Rayner, Chace, Slattery & Ashby, 2006; van den Broek et al., 2005). Also, the comparison of reading times for matching and mismatching information has been used to assess the accessibility (saliency) of certain information. For information matches, the new information that has to be integrated is in line with previous (old) information. Therefore, its integration should be relatively easy and, hence, reading times should be comparatively fast. Fast processing times are also indicative of a stable and accessible representation that is quickly reactivated by new matching information.

For mismatching or inconsistent information, readers are not able to link new and old information, or to reactivate previously established representations. They need to *reestablish coherence* (Albrecht & O'Brien, 1993, p. 1067) within the text by making

inferences, which lead to additional and more complex comprehension processes and therefore longer processing times (van den Broek et al., 2005; Albrecht & O'Brien, 1993). The longer the process of reestablishing coherence the more severe the problems arising from the mismatch between previous and new information. Therefore, longer reading times for information mismatches might indicate the detection of a large difference between the information that is included in a reader's mental representation and the new information and/or that the new information clashes with a stable (salient) representation.

Inconsistency paradigms and the use of matching and mismatching information has been a useful method to measure readers' (in)ability to establish coherence during comprehension and to monitor processing problems as a result of incoherence. It has also been used as evidence that readers are able to integrate certain types of information (e.g. emotions) into their mental representations and to assess salience and accessibility of information within a mental representation. Therefore, for our studies, match and mismatch effects are an interesting tool to investigate whether processing and comprehension is affected by specifically emotional information, and whether other factors (e.g. perspective or mood) affect the accessibility and the nature of these emotional representations.

1.7.3. Mood Induction Procedures

In order to explore how mood affects reading processes during text comprehension in an experimental setting, researchers employ different mood manipulation techniques prior to the main experimental procedure. There is a variety of *mood induction procedures* (Westermann, Spies, Stahl & Hesse, 1996) that have been used by researchers investigating mood effects. These include *imagination* procedures (imagining personal emotional life situations, Krauth-Gruber & Ric, 2000), the *Velten*

procedure (instruction to internalize emotional statements, Velten, 1968), the induction via *facial expressions* (e.g. Havas et al. 2007), and procedures using either *films* (van Berkum, de Goede, van Alphen, Mulder & Kerstholt, 2013) or *music* (Zentner, Grandjean & Scherer, 2008; see also Westermann et al., 1996, for additional procedures).

The quality and suitability of the induction procedure depends upon certain criteria. An appropriate procedure should primarily ensure that the mood between groups is stably and reliably different throughout the experiment, so that differences in reading behaviour or comprehension are the clear result of the mood manipulation. Moreover, procedures should be as naturalistic as possible (Rottenberg, Ray & Gross, 2007) and similarly effective for the emotions that are sought to be induced. For example, in our experiment, we aim to have a positive and a negative mood group. Therefore, the procedure should induce negative as well as positive mood states equally well (Westermann et al., 1996). Also, the induction procedure should be similarly effective across participants to avoid effects of gender or other individual differences. On the basis of these criteria some researchers (Rottenberg et al., 2007; Westermann et al., 1996) recommend the use of certain mood induction procedures, for example inductions using film clips, over others.

Westermann et al. (1996) presented a meta-analysis on the effectiveness of eleven different mood induction procedures. In their analysis, effectiveness was evaluated using three main criteria: *specificity of induced mood*, *individual differences* and *demand effects* (Westermann et al., 1996). Their results gave evidence that overall, mood induction procedures using films were most effective. Westermann et al. (1996) found similar success rates to Martin (1990) who reported that film, music and imagination induction procedures affected 75% of their participants in comparison to an average success rate of 50% for other procedures. Also, Westermann et al. (1996) reported that films were the

only medium for which the induction of positive mood states was similarly successful to the induction of negative mood states. For the remaining procedures, effects were stronger for negative mood states than for positive states, and therefore, for positive mood states, film induction procedures had a clear benefit over all other mood induction techniques. In the meta-analysis Westermann et al. (1996) did not find evidence of gender differences for induction effects. In addition to the main induction procedures, Westermann et al. (1996) distinguished between procedures with and without explicit instruction. Participants were either instructed to assume, imagine or feel the mood state that was presented during the procedure or no explicit prompt was given about the task. As indicated by Westermann et al. (1996) the provision of explicit instructions might yield stronger induction effects, but might also be linked to demand characteristics. For film induction procedures, stronger effects were found for the procedure-with-instruction condition. However, even without instruction, the effectiveness of the film induction procedure was found to be high (compared to other procedures) and most stable across the different moods.

For their ERP study testing mood effects on syntactic parsing and semantic anticipation during language processing, van Berkum et al. (2013) used film clips to ensure long-lasting mood induction effects. Clips were taken from two different films. For the positive mood induction, film segments were chosen from the Warner Brother's production *Happy Feet* (2006). In their study five segments of the animated family and comedy film were chosen and they lasted between three and four minutes per segment. For the negative induction, the same number of segments of similar length were chosen from the American drama *Sophie's Choice* (ITC Entertainment, Universal Pictures, 1982).

For the mood manipulation check, van Berkum et al. (2013) used a self-report questionnaire (see also de Vries, 2008). Mood was assessed before and throughout the experiment, in order to ensure that mood induction effects were stable during the study. For each self-report, participants were asked to rate their mood using a total of 25 adjectives describing feelings or states, ten of which were included for the mood assessment (manipulation check). These ten state adjectives described clearly valenced emotional states such as *sad* or *funny*. The remaining adjectives functioned as distractor items. Participants evaluated the extent to which a particular state (e.g. *sad*) described their own emotion *at the moment in time*, on a scale from 1 (*does not describe my emotion at all*) – 7 (*very good description of my emotional state*). The comparison of mood ratings between the film groups revealed differences in self-reported mood for all mood assessments after the mood induction. The mood analysis revealed that participants started the experiment in a similar mood (there was no difference between groups *before* the mood induction) and that the induction via film clips affected participants' self-assessed mood stably throughout the experiment (with more negative ratings for the negative film group, i.e. the group watching *Sophie's Choice* and more positive ratings for the group watching *Happy Feet*).

Previous research has demonstrated that mood induction procedures including film clips are reliable and robust. In addition, the study by van Berkum et al. (2013) provides a good example of a successful mood induction with effects lasting stably throughout the experiment. Therefore, we will adopt a similar induction strategy for our own experiment. Again, film clips will be used to induce positive and negative moods. As our study will be shorter, with fewer items, we will only use a subset of the van Berkum et al.'s (2013) film segments i.e. two from *Happy Feet* and two from *Sophie's*

Choice. Again, self-report questionnaires (van Berkum et al., 2013; de Vries, 2008) will be used for the mood assessment before and after the induction procedure.

1.7.4. Eye-tracking

As noted above, reading times are useful to assess reading behaviour and ease of processing. For the majority of our studies, self-paced reading methods were used to explore whether readers can process and integrate some types of information more easily than others. For example, we aimed to investigate whether readers are more engaged with emotional situations in text when these situations are presented from a personal perspective and whether an increase in engagement leads to faster processing. Therefore, we would expect faster reading times for sentences or texts that include the pronoun *you* compared to sentences including the pronouns *he* or *she*. The reading time data can confirm our hypothesis and they can reveal general processing differences, however they do not provide additional information as to why, where and when these differences arise. For example, do readers focus more on specific words or text regions in the *he/she* perspective and therefore need longer to process them? If so, do they need longer to process the pronoun *he* rather than *you* or is the time difference in SPR explained by the increased (longer) focus on word regions? Another explanation for longer reading times could be that readers have to go back and reread previous elements of the text in order to integrate and match new information with previous information. During non-cumulative self-paced reading, the process of going back in the text is not possible. Even in cumulative SRP, reading times cannot distinguish between a longer focus on specific information and rereading. In order to explore reading behaviour in more detail, eye-tracking measures will be used to investigate the perspective effect during reading comprehension.

Eye-tracking techniques have been used to explore reading comprehension and text processing since the beginning of the 20th century (Just & Carpenter, 1980; Carpenter & Just, 1977; Dearborn, 1906), and have been particularly important since the 1970s, following major technical advances (Rayner, 1998). Skilled adult readers can process (read) 150 - 400 words per minute (Carpenter & Just, 1977). When trying to understand a text, readers focus on and encode certain words in the text. These periods of focus on a specific word (when eyes are resting on a certain region) are called *fixations*. Eye-movements between these fixations are *saccades*. Saccades (eye-movements) can be either forward (i.e. from left to right for e.g. European languages using the Latin, Greek or Cyrillic alphabet, processing new text) or backward (i.e. *regressive*, from right to left, refocusing on previous text elements).

During normal reading (as opposed to for example skim-reading), readers tend to fixate content words (i.e. nouns or verbs) within a text, however, they are able to skip over short function words (i.e. pronouns, conjunctions and prepositions) without fixating them. During a fixation, new information is captured and encoded. As saccades are too fast to clearly capture a visual image of the text, new information cannot usually be encoded during a saccade (Rayner, 2009, Rayner, 1998). However, some researchers (e.g. Irwin, 1998; Rayner, 1998) argue that cognitive processing of previous information can still continue during the movement.

As mentioned previously, reading times should be directly linked to the time it takes to process a word (see *eye-mind assumption*, Just & Carpenter, 1980). As argued by Rayner (1977), more complex and less frequent words, sentences or passages are focused for longer periods than simple text elements. In his research, Rayner (1977) found evidence that readers specifically attend to the main verb of the sentence (as measured by longer gaze durations) in order to comprehend its meaning overall. This result indicates

that fixation times (or *gaze durations* i.e. the sum of fixation durations on a region before moving forward or regressing) reflect cognitive processes, in that more difficult processing is accompanied by longer fixation times. Fixation times are therefore not only an important tool to measure reading speed, but give essential information about cognitive processing (Rayner, 2009; Rayner, 1998; Rayner, McConkie & Ehrlich, 1978; Rayner, 1977).

Gaze durations reflect first-pass reading times, which means that durations only reflect the *initial* reading of the text element, before leaving the region to focus on other parts of the text. Hence, gaze durations do not account for time spent rereading the text segment (i.e. subsequent regressions). As mentioned above, eye-tracking can provide information about whether processing difficulties are associated with longer fixations on a word (as a result of encoding difficulties), or more global comprehension or integration errors where readers have to go back in the text and reread previous information. As discussed, first-pass measures such as the gaze duration, can give information about encoding and lexical access processes that are influenced by the complexity, length or frequency of the text element (Rayner, 1977). Regressions, however, can give information about comprehension and interpretation *failures* (Rayner, 1998; Frazier & Rayner 1982), so they reflect problems of readers in integrating new information and establishing coherence between text elements. Readers therefore have to regress to check over previous information and to search for the origin of the comprehension error.

For our study, it will be interesting to explore reading differences as a function of perspective. We expect reading times to be shorter for the *you* perspective, due to an increase in the readers' engagement with the personal perspective. Also, we assume that the personal engagement is moderated by the valence (positive or negative) of the text, with positive text being more engaging and negative less engaging in the personal

perspective. We employ eye-tracking measures to examine whether processing differences between the perspectives are the result of differences during the encoding stage or the integration stages. For example, if we find reading time differences between negative and positive text (with longer times for negative texts) in the *you* perspective, it will be interesting to examine whether these differences arise because negative information is more in the focus of the reader, and therefore fixated for longer during first-pass reading, or whether differences are due to readers' reluctance to integrate negative information in the personal perspective (as though they experience a negative situation). Hence, our last experiment is aimed to take a closer look at perspective effects and explain reading time differences based on perspective in more detail, by using eye-tracking measures.

1.8. Aim and hypothesis

This project aims to give an account for how emotions affect reading comprehension and processing. It is hypothesized that emotions are an important factor that help our understanding of the text as they can be used to establish coherence during reading, and hence, it is assumed that character representations that are linked to emotional features are particularly salient and in focus of the reader. It is also suggested that emotion processing and the build up of mental representations that include emotional information are affected by different reader-related factors such as their own emotions and/or by the perspective readers take during the reading process. Overall, with this thesis I attempt to improve the understanding of how readers engage with and process emotional information during text comprehension.

2. Remember they were emotional – Retrieval processes of qualified representations during sentence processing

Scarlett Child,

Jane Oakhill &

Alan Garnham

University of Sussex

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2.1. Abstract

We investigated whether emotional information facilitates retrieval and whether it makes representations more salient during sentence processing. Participants were presented with sentences including entities (nouns) that were either bare, with no additional information or that were emotionally or neutrally qualified using adjectives. Reading times in different word regions, specifically at the region after the verb where retrieval processes are measurable, were analysed. Qualified representations needed longer to be built up than bare representations. Also, it was found that the amount of information and the type of information affect sentence processing and more specifically retrieval. Retrieval for emotionally specified representations in particular was faster than that for bare representations.

Keywords: sentence processing, retrieval, emotion, information load

2.2. Introduction

Can you remember an *angry politician* better than a *small politician*? Previous studies have focused on whether the amount of information that is associated with an entity can improve its recall from memory (Hofmeister, 2011). In contrast to this body of research, our study asks the question whether *the type* (rather than the amount) of information that is provided in connection to an entity is similarly important to consider when accessing information for recall.

When we read, we form mental representations of the situations and characters presented within a text or sentence (Glenberg & Langston, 1992, Zwaan, Magliano & Graesser, 1995). These situational representations contain a number of features provided by the linguistic context. Each representation is linked to a certain set of features (associations). Based on the amount of information associated with an entity, the representation can be either rich or weak in memory (Hofmeister, 2011). Rich representations are linked to a large set of features. Weak or bare representations are linked to a smaller set of features.

Research on sentence processing has found that the *amount* of features associated with an entity is relevant for recall. For example, Hofmeister (2011) gave evidence that semantically rich concepts, i.e. concepts for which a lot of information is provided, are more easily recalled than items for which there is no contextual information. In this study, cleft sentences were used to monitor facilitated retrieval processes for complex (semantically rich) noun phrases (see example 2.1). Noun-phrases were simple or more complex in structure in that they were presented with either no, one, or two qualifying adjectives:

Example 2.1:

*simple: It was a **communist** (i) who the members of the club banned (i) from ever entering the premises.*

*mid: It was an **alleged communist** (i) who the members of the club banned (i) from ever entering the premises.*

*complex: It was an **alleged Venezuelan communist** (i) who the members of the club banned (i) from ever entering the premises. (Hofmeister, 2011)*

Sentences included long-distant dependencies in order to highlight retrieval effects after the verb (*banned* in this example). During reading, sentence components have to be analyzed and related to one another. In the examples above, a cleft after the verb (i) must be identified as a reference point to the prior noun phrase. Therefore, the noun (e.g. ‘*the communist*’, in example 2.1) has to be kept in memory until it can be integrated as the object of the verb phrase (e.g. ‘*banned*’). For the experiment, retrieval times at the critical region after the verb as well as for the initial noun phrases were measured. In Hofmeister’s (2011) study, either zero, two or one adjective(s) preceded the noun. Findings revealed a linear relationship of reading time to complexity, with proportionally faster reading times for the region after the verb for each adjective qualifying the noun (i.e. for mid and complex conditions). This finding shows that a rich semantic context leads to a more elaborated, more salient representation in memory and hence to faster re-activation rates and faster integration. In the current study, we will use a very similar design to Hofmeister (2011) and look at whether recall and the salience of the representations differ between non-qualified, qualified and strongly qualified nouns. The focus of our study is, however, whether recall of the nouns and the salience of their representations depend on the *type* of information that is linked to them.

Our study builds on Hofmeister’s findings and aims to explore whether the salience of a representation can be enhanced not only by providing more information

about the entity, but by making the information itself more salient. Emotions in particular have been identified as important for building mental representations (Gygax, Oakhill & Garnham 2003; Zwaan, 1999b; de Vega, León & Díaz, 1996; Kneepkens & Zwaan, 1995; Graesser, Singer & Trabasso 1994, Gernsbacher, Goldsmith & Robertson 1992). Gernsbacher et al. (1992) found that emotional features are mentally represented and incorporated into the overall context during reading. It is argued (Mar, Oatley, Dijkic & Mullin, 2011) that readers engage more with a text when they read about a character's emotions, as they are able to identify with or sympathise with the character's emotional state. Graesser et al. (1994) argue that the emotional state of characters is interpreted during the reading process and that emotional states help to establish global coherence within the text. As argued by Zwaan (1999b), emotional information is closely related to the characters' goals (their motivations) (e.g. a character is happy when successfully achieving a goal, for example getting a promotion). Hence, emotions link events (the character being promoted and the character being happy) in text and provide explanations for the characters' actions and behaviours later in the text (the character organizes a celebration party). Also, readers are able to spot emotional inconsistencies within the text (e.g. if following their success, the character is described as *upset*, Gernbacher, Hallada & Robertson, 1998; Gygax et al., 2003). These emotional inconsistencies have been found to cause processing problems as the new information cannot easily be integrated with the existing representation (of a successful and happy character). We believe that emotional information helps readers to build up a more coherent and more engaging mental representation. Based on this idea, we suggest that representations that include emotional information are more salient and more easily retrieved.

Our study aims to show that representations including emotional information are more salient than those including neutral information and that therefore, emotions can

facilitate retrieval processes. Previous research on word processing found evidence that emotions capture the readers' attention and that emotional information remains in focus during reading (Herbert, Junghofer & Kissler, 2008, Kanske & Kotz, 2007). Also, the role of emotional information for text processing has been investigated (Gernsbacher et al. 1992, Gygax et al. 2003). However, the impact of emotionally charged representations on sentence processing and specifically on retrieval processes remains unclear. As predicted by cue-based retrieval models (Van Dyke & Lewis, 2003), the presence of semantic features facilitates retrieval processes. Thus, it can be predicted that the prioritisation of certain (i.e. emotional) semantic features over other (i.e. non-emotional) features affect memory performance and lexical access during sentence comprehension, which is the focus of our current study.

Quite frequently, entities share a lot of semantic features and, even if their representation is unique, they can have a great overlap with regard to their associations in memory. This overlap makes their identification in memory i.e. their retrieval more difficult (Gordon, Hendrick, Johnson & Lee, 2006). By contrast, entities with a higher number of features and more unique or more salient features lead to faster and easier retrieval (Traxler, Morris, & Seely, 2002). In our experiment, we investigated whether emotional information causes representations to be more salient and unique in memory and therefore we predict that retrieval for representations that include emotional features is facilitated.

The study adds to and brings together research on emotional effects on comprehension and research on information retrieval during sentence processing. We test whether emotional representations containing emotional features are more easily retrieved than neutral representations or representations without additional information. Therefore, in our experiment, we will present sentences similar to the ones used by

Hofmeister (2011). As in Hofmeister's (2011) study, sentences will contain a noun that is either bare or qualified (with features characterising the representation of its referent). Building on Hofmeister's (2011) design, we will add a condition in which one of the qualifiers is of an emotional type i.e. provides emotional information about the person mentioned. For sentences including two qualifiers, only one is emotional for the emotional condition. The second one is emotionally neutral and the same as in the non-emotional condition. This design allows us to investigate whether processing is affected more by the amount of information, which would be reflected in generally faster recall for more qualified nouns (regardless of emotional type). Hence, reading times would be faster for nouns that are qualified by two adjectives, and the processing benefit between nouns qualified by one adjective would be similar for emotional and non-emotional conditions. However, we predict that emotional information cause representation to be more salient, and hence, retrieval for emotionally qualified nouns should be faster than for non-emotionally qualified entities. If results are in line with Hofmeister (2011), nouns including two qualifiers (high information load) will be retrieved with greater ease than nouns with fewer qualifiers (mid information load or bare). Hence, we predict that retrieval is fastest for noun qualified by two (rather than one) qualifiers, one of which is emotional.

2.3. Method

2.3.1. Participants

Seventy-two individuals were recruited to participate in the study. Data sets for three individuals had to be removed because of technical problems. All participants were blind to the purpose and subject of the study. Moreover, all participants were recruited at the University of Sussex and indicated a comparably high level of education. Only native

speakers of English were tested. None of the participants reported or showed signs of a reading disorder. The age range was from 18-42 years, with $M = 23.25$, $SD = 6.61$.

2.3.2. Items

Twenty-four critical items were generated in five different conditions, including different levels of semantic information:

Example 2.2

bare: *It was a writer that the dignitaries at the ceremony awarded with a medal in Stockholm.*

emotional: *It was an optimistic (English) writer that the dignitaries at the ceremony awarded with a medal in Stockholm.*

non-emotional: *It was a reclusive (English) writer that the dignitaries at the ceremony awarded with a medal in Stockholm.*

For the first condition (bare), the first noun phrase was not preceded by any adjectives (see example 2.2). For all other conditions, nouns were preceded by either one or two adjectives (mid information load and high information load). For the emotional conditions, one emotional adjective qualified the noun, which was followed by a non-emotional adjective for the high load condition, in which two adjectives were included (we refrained from including two emotional qualifiers as characters usually only have one emotion at a time). For the non-emotional conditions only emotionally neutral qualifiers (one or two) preceded the noun. Items for the bare and the two non-emotional conditions were taken over from Hofmeister's experiment in 2011. In order to disguise the experiment's purpose, 32 filler items were added to each list. The 56 items presented to each participant were presented in a random order that was different for each participant.

2.3.3. Design

The experiment included two independent variables. The first one was the information type with three levels (bare, non-emotional and emotional qualifiers, within-items and within-subjects). The second one was the information load i.e. the number of adjectives provided for the information rich conditions (one (mid load) or two adjectives (high load), within-items, between-subjects). We measured reading times for each word in each sentence. In addition, we recorded answers for comprehension questions as our accuracy measure. In accordance with the Latin Square Design, six different lists were created, three contained bare items, plus qualified conditions with two adjectives (high load) and three contained bare items plus qualified conditions (two adjectives). Each sentence was included in only one condition (bare, emotional or non-emotional; with eight items of each information type per list).

2.3.4. Word/ Sentence Ratings

The adjectives we used in our items were rated for their concreteness, imageability, and their frequency. Concreteness and frequency scores for each adjective were obtained using the MRC psycholinguistic database (Coltheart, 1981; http://websites.psychology.uwa.edu.au/school/MRCDatabase/uwa_mrc.htm; we could not obtain frequency scores for seven adjectives). Ratings for imageability were obtained in an online survey conducted using Mechanical Turk (MTurk, <https://www.mturk.com/>). Imageability ratings were given on a 5-point scale from 1 (e.g. *not imageable*) to 5 (e.g. *very imageable*). We compared imageability, concreteness and frequency scores for adjectives in the emotional and non-emotional conditions using t-tests. We found that imageability ratings did not differ between emotional and non-emotional adjectives ($p > 0.1$). For imageability scores Cronbach's alpha was 0.99 on a 48 items scale. It was also

found that frequency scores were higher ($M = 56.73$, $SD = 86.61$) for non-emotional adjectives (i.e. the non-emotional adjectives that were used in this study can be more frequently found in texts) than for emotional adjectives ($M = 15.58$, $SD = 17.90$; $t(39) = 2.03$, $p = 0.049$).² For frequency scores, Cronbach's alpha was 0.96 on a 41 items scale. Concreteness scores were not affected by information type ($p > 0.1$). For concreteness scores Cronbach's alpha was 0.99 on a 48 items scale.

Moreover, in another Mechanical Turk survey we asked individuals to rate the whole experimental sentences for whether they seemed natural. Ratings were given on a 5-point scale from 1 (e.g. *not natural*) to 5 (e.g. *very natural*). An ANOVA was used to compare sentence ratings across emotion type conditions. Ratings on complete sentences were not affected by the conditions ($p > 0.1$). Cronbach's alpha was 0.94 on the 72 items scale.

2.3.5. Procedure

Items were presented using the computer software E-Prime 2 (Schneider, Eschman & Zuccolotto, 2012). Participants were tested in a self-paced reading paradigm. Following Hofmesiter (2011) after three practice trials, sentences were displayed word by word on a computer screen (Dell, 17-inches). Responses were given through a button-box, and reading times for each word were recorded. A comprehension question followed each sentence (in order to ensure that participants attended to the task, they were asked to answer as fast as possible). Participants were asked to answer either 'YES' or 'NO' on

² Due to the frequency differences between emotional and non-emotional adjectives and due to the notion, that frequency affects processing latencies especially for recall (van Gompel & Majid, 2004), we included frequency as a covariate fixed factor into our analyses (the LMMs). We found no effect of frequency on reading times (for the noun-phrase: $\beta = 0.00$, $SE = 0.00$, $t(240) = 0.67$, $p > 0.1$; for region after noun: $\beta = 0.00$, $SE = 0.00$, $t(108) = 0.26$, $p > 0.1$; for verb-phrase: $\beta = 0.00$, $SE = 0.00$, $t(121) = 0.02$, $p > 0.1$ and for region after the verb: $\beta = 0.00$, $SE = 0.00$, $t(299) = 0.05$, $p > 0.1$).

the button box. Once an answer was, the next trial started, indicated by a cross, displayed on the screen.

2.4. Results

The data were analysed by regions of interest i.e. the head noun (e.g. ex. 2.2, ‘*writer*’), the word after the noun phrase (e.g. ex. 2.2, ‘*that*’), the word of the verb (e.g. ex. 2.2, ‘*awarded*’) and the word after the verb (e.g. ex. 2.2, ‘*with*’). Reading times were transformed using a natural logarithmic transformation, in order to counteract a negative skew. We excluded outliers for each region separately, defined as data points more than 2.5 standard deviations away from the mean per condition (Fedorenko, Gibson & Rohde, 2007). For the region of the noun-phrase, we excluded 1.88%; 1.88% for the region after the noun; 2.55% for the verb-phrase region and 2.52% for the region after the verb phrase. We also only included data from trials followed by correctly answered comprehension questions, so 11% of the data were excluded and the proportion of incorrectly answered trials did not differ by condition (see Table 2.1; Hofmeister, 2011).

	Accuracy		
	<i>Odds Ratio</i>	<i>CI</i>	<i>p</i>
(Intercept)	7.93	6.13 – 10.46	<.001
Condition			
<i>Emotional (HL)</i>	0.90	0.58 – 1.41	.642
<i>Non-emotional (HL)</i>	1.04	0.66 – 1.66	.877
<i>Emotional (ML)</i>	1.08	0.66 – 1.83	.753
<i>Non-emotional (ML)</i>	0.90	0.56 – 1.46	.651
Observations	1564		

Table 2.1. GLM coefficients for Accuracy by condition (bare vs emotional and non-emotional, high load (HL) and medium load (ML))

In order to account for reading time differences based on word-length effects, logarithmic reading times were residualised (using regressions by participant, again for each region separately) (Fedorenko et al., 2007). We used linear mixed modelling for the main analysis, using R and the package lme4 (Bates, Maechler, Bolker & Walker, 2015), with the default restricted maximum likelihood estimations (R Studio Team, 2015). In addition, to obtain probability values, we used the Satterwaithe approximation from the lmeTest package (Kuznetsova, Brockhoff & Christensen, 2015). Model fit was evaluated using screeplots of Principal Component Analyses produced by the RePsychLing package (Baayen, Bates, Kliegl & Vasishth, 2015) and the Akaike Information Criterion (AIC, Bates, 2010). We report models that were not subject to convergence issues or overfitting (Bates, Kliegl, Vasishth & Baayen, 2015), and that generated the lowest AIC scores. As fixed-effects, we included the type of information that was provided with the noun phrase (i.e. no information, emotional information or non-emotional information) and the information load in qualified conditions (one adjective or two adjectives). Contrasts were set (we used sum contrasts) in line with our hypotheses, that emotional information leads to processing differences, hence we used the emotional information condition as a baseline i.e. bare vs emotional and non-emotional vs emotional information. The lsmeans package (Length, 2016) was used for pairwise comparisons and means for log reading times are reported. We included random intercepts³ and slopes for participants and items. Tables were generated using the sjPlot package (Lüdtke, 2018).

³ Because of known, and unresolved, problems in the reporting of parameter estimates for lmer models with no random intercepts (see Walker, 2014; Bolker, 2013), we focused on models that included random intercepts. For the RT data estimates of the variability of the intercepts for participants were correct at 0.

Graphs show residual reading times (reading times below zero are faster than baseline, and slower than baseline for times above zero).

2.4.1. Reading Times for the head noun (NP, e.g. *writer*)

First, reading time effects were analysed for the region of the initial head noun. In two of the three conditions the noun was preceded by two or one qualifier(s) (e.g. ‘*English*’). As can be seen in Figure 2.1, we found that reading times in the emotional condition ($M = 11.88$, $SD = 188.79$) with an emotional qualifier, see Table 2.2) were longer than for both other conditions (marginal for bare: $M = 6.40$, $SD = 222.46$; $\beta = 0.04$, $SE = 0.021$, $t(1337) = 1.92$, $p = 0.056$; and significant for non-emotional: $M = -18.63$, $SD = 160.10$; $\beta = 0.04$, $SE = 0.021$, $t(1335) = 2.00$, $p = 0.046$).

	Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.03	-0.01 – 0.06	.123
Bare	-0.04	-0.08 – 0.00	.056
Non-Emotional	-0.04	-0.08 – -0.00	.046
High Load	0.03	-0.00 – 0.06	.087
Bare: High Load	-0.06	-0.10 – -0.02	.003
Non-Emotional: High Load	-0.01	-0.06 – 0.03	.487
Random Parts			
σ^2		0.100	
$\tau_{00, \text{Part}}$		0.000	
$\tau_{00, \text{Exp}}$		0.002	

Table 2.2. LMM coefficients and effects of information type (emotional vs bare and non-emotional) and number of adjectives (mid or high load) on reading times at NP

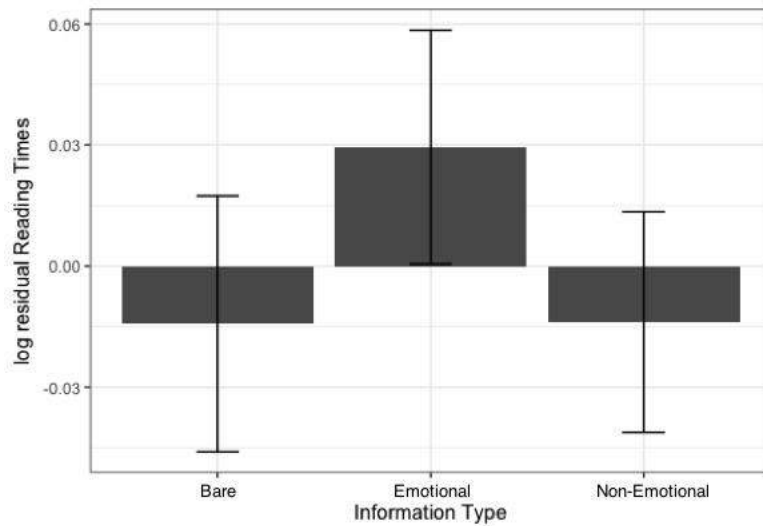


Figure 2.1. Reading times for information types at head noun, (+-1 SE)

In addition, we found an interaction between the types of information and information load preceding the noun (see Table 2.1). Figure 2.2 shows that when nouns were preceded by two adjectives (high load) in the information conditions reading times were slower for emotionally qualified nouns ($M = 547.19$, $SD = 280.40$) compared to bare nouns ($M = 511.70$, $SD = 288.16$; $\beta = 0.10$, $SE = 0.03$, $t(1337) = 3.60$, $p = 0.005$). In the item set where nouns were preceded by only one adjective (mid load), reading times were similar for all conditions (bare, emotional and non-emotional).

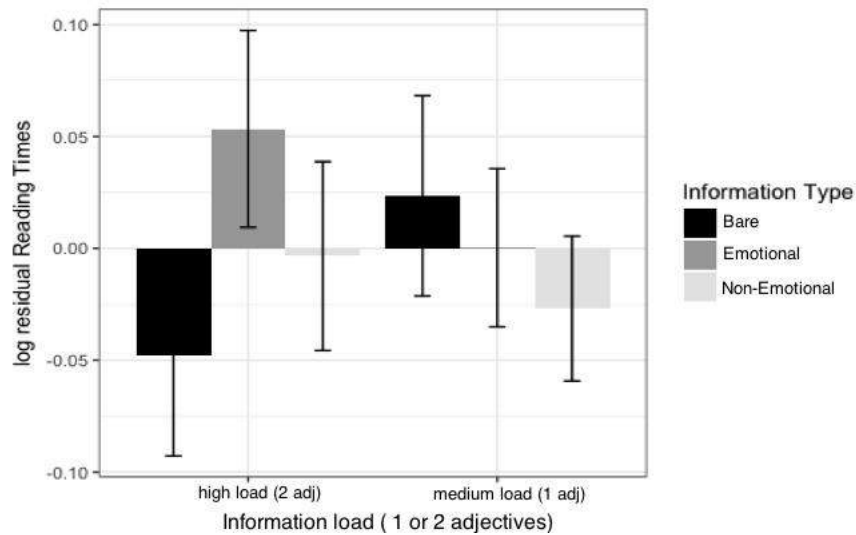


Figure 2.2. Reading times for different types of information and different information loads (high/mid load), (+-1 SE)

2.4.2. Reading Times for *That* (Region after the NP)

In line with the results reported by Hofmeister 2011 (Experiment 1), we also found complexity effects as a spill over after the noun phrase (Table 2.3).

	Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.02	-0.01 – 0.06	.157
Bare	-0.08	-0.12 – -0.04	<.001
Non-Emotional	0.01	-0.04 – 0.05	.759
High Load	0.01	-0.02 – 0.04	.387
Bare:High Load	-0.01	-0.06 – 0.03	.537
Non Emotional:High Load	-0.02	-0.07 – 0.02	.263
Random Parts			
σ^2		0.117	
$\tau_{00, \text{Part}}$		0.000	
$\tau_{00, \text{Exp}}$		0.001	

Table 2.3 LMM coefficients and effects of information type (emotional vs bare and non-emotional) and number of adjectives (mid or high load) on reading times at region after NP

Encoding of qualified nouns was found to be more difficult compared to bare nouns ($M = 457.44$, $SD = 161.90$) (emotional: $M = 24.72$, $SD = 280.91$; compared to bare: $\beta = 0.08$, $SE = 0.02$, $t(1391) = 3.52$, $p < 0.001$; non-emotionally qualified nouns: $M = 536.06$, $SD = 316.94$; compared to bare: $\beta = 0.09$, $SE = 0.02$, $t(1389) = 3.83$, $p < 0.001$). We did not find effects of information load for the information conditions (see Table 2.3, Figure 2.3).

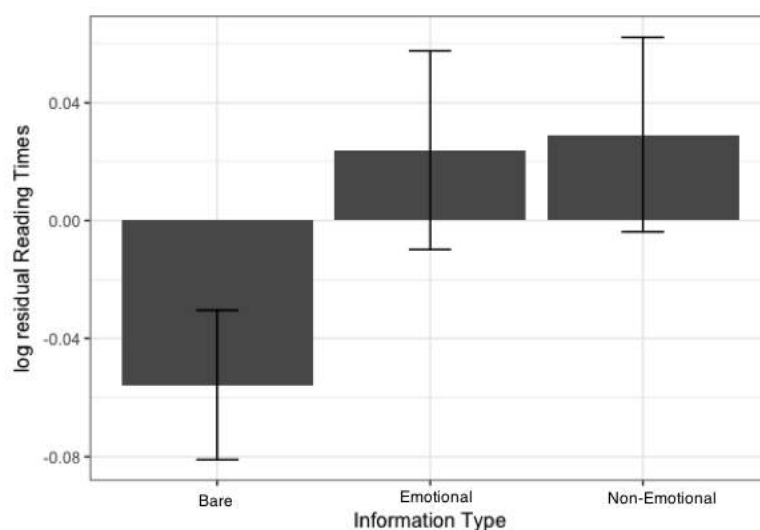


Figure 2.3. Reading times for information types at word after head noun (*that*), (+1 SE)

2.4.3. Reading Times for the verb and the word after the verb

	Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.00	-0.03 – 0.03	.963
Bare	0.01	-0.03 – 0.05	.563
Non-Emotional	-0.01	-0.05 – 0.03	.648
High Load	0.01	-0.02 – 0.04	.622
Bare:High Load	-0.01	-0.05 – 0.03	.533
Non-Emotional:High Load	-0.01	-0.05 – 0.03	.656

Random Parts

σ^2	0.104
$\tau_{00, \text{Part}}$	0.000
$\tau_{00, \text{Exp}}$	0.001

Table 2.4. LMM coefficients and effects of information type (emotional vs bare and non-emotional) and number of adjectives (mid or high load) on reading times at VP

We did not find effects at the region of the verb (e.g. ‘*awarded*’, see Table 2.4).

We did not find effects of load or emotion type. However, in line with Hofmeister’s study (2011), the analysis revealed processing effects of information type at the region after the verb (e.g. *with*, see Table 2.5).

	Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	-0.01	-0.05 – 0.02	.367
Bare	0.04	0.01 – 0.07	.020
Non-Emotional	0.01	-0.02 – 0.04	.473
High Load	0.00	-0.02 – 0.02	.939
Bare:High Load	0.00	-0.03 – 0.04	.835
Non-Emotional:High Load	-0.01	-0.04 – 0.03	.696
Random Parts			
σ^2		0.066	
$\tau_{00, \text{Part}}$		0.000	
$\tau_{00, \text{Exp}}$		0.003	

Table 2.5. LMM coefficients and effects of information type (emotional vs bare and non-emotional) and number of adjectives (mid or high load) on reading times at region after VP

Contrasts revealed that the effect was based on the comparison between the bare condition (no information preceding the noun) and the emotional condition (one emotional qualifier preceding the noun): $\beta = 0.03$, $t(1407) = 2.34$, $SE = 0.02$, $p = 0.02$.

Participants read faster when the adjective qualifying the noun was of an emotional nature ($M = 444.73$, $SD = 169.18$) as compared to bare nouns ($M = 465.95$, $SD = 183.55$; see Figure 2.4).

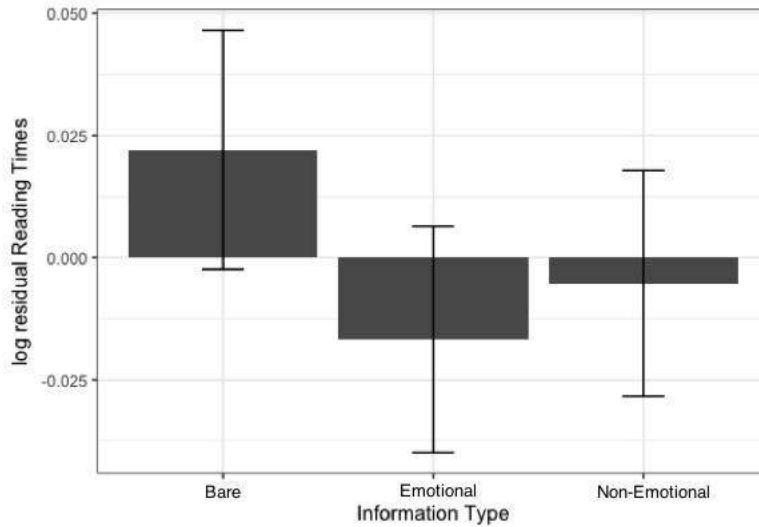


Figure 2.4. Reading times for information types at region after VP, (+1 SE)

We did not find reading time differences between the conditions including a non-emotionally qualified noun ($M = 452.41$, $SD = 177.12$) and bare ($t = 1.62$, $p > 0.1$) or emotionally qualified nouns ($t = 0.72$, $p > 0.1$). Also, again, effects of information load (one or two adjectives) were not evident.

2.5. Discussion

The current study was set up to investigate whether mental representations that are qualified with information, specifically of an emotional type, have a processing benefit over bare representations or non-emotionally qualified representations. We found evidence that qualified representations needed longer to be build-up, but that emotionally qualified entities have a processing benefit over non-qualified entities.

For the head noun, we found that reading times were longer for emotionally qualified nouns, but only when two adjectives preceded the noun (rather than only one).

This finding shows that complexity effects arise earlier for emotionally qualified nouns (compared to non-emotionally qualified nouns), and that the combination of emotional and non-emotional information coincides with even more complex encoding processes. We believe that the combination of those two types of information is rather unusual and hence, unexpected, leading to longer reading times. Moreover, it could be suggested that complex but non-emotional information is perceived as rather irrelevant so processing efforts are reduced. In contrast, readers attend to (Herbert et al. 2008; Kanske & Kotz, 2007) and are sensitive to the emotional status of the (complex) emotional information, which could be relevant later in the text (as it might help establishing coherence or explain later events (Zwaan, 1999b; Kneepkens & Zwaan, 1995) and hence they need longer for the encoding process. So far, findings are in line with Hofmeister's notion (2011) about complexity effects. Readers needed longer to build up representations of more complex nouns. In addition, we found evidence that emotional pieces of information enhance this complexity effect and hence, they slow encoding processes.

The experiment replicated the findings of Hofmeister (2011) at the region after the noun-phrase. Results show that nouns preceded by qualifiers need longer to be processed and encoded (as indicated by reading times at the region after the noun phrase). In these cases, more information has to be processed, stored, and associatively linked in memory. Therefore, readers need longer to build up representations and place the noun into the richer context (Hofmeister, 2011). However, results did not reveal differences between emotional and non-emotional information in the encoding stage. Emotional features did not facilitate or inhibit encoding processes, which means that readers were able to build up mental representations at a similar pace regardless of their emotional status. Hence, at the encoding stage, information load (i.e. richness and specificity of a representation) does affect reading times in that it is more difficult to establish mental

representations when entities are linked to more feature associations. These findings are in line with those of Hofmeister (2011). We did not find effects of emotional type or of information load (one vs. two qualifying adjectives) for this region, however, we also analysed the region of the head noun, where effects of both were evident.

In addition to the region around the noun phrase, we focused on the region around the verb phrase, at which retrieval effects are predicted to be found (e.g. from cue-based retrieval models, Van Dyke & Lewis, 2003), because the extraction site for the clefted element comes immediately after the verb. We expected signs of a facilitated retrieval when the to-be-retrieved noun previously occurred in a conceptually rich context (qualified by adjectives, e.g. *'the English writer'*). Similar to Hofmeister (2011), we argued that rich representations should be easier to recall, for the reason that they are more salient in memory due to a broader network of associations linked to the target. Moreover, we suggested that more information helps to distinguish different representations within the sentence and that therefore the target can be more easily identified (Hofmeister, 2011).

Our study found evidence that emotional information in particular affects retrieval processes. Retrieval rates differed at the word that followed the verb. Differences were evident between emotionally charged representations and non-qualified representations and retrieval times were faster for entities that were qualified by emotional information. These effects suggest a special role of emotional information during processing.

The differences between emotionally charged and neutral representations indicate that, not only does the amount of information itself play a role in establishing mental representations (as shown by Hofmeister in 2011), but that also the type of information is relevant. Hofmeister (2011) argued that more qualified, richer representations lead to an easier retrieval. However, we could only find a difference in retrieval rates between

bare and emotional representations. We assume that, in line with cue-based models, a high number of features can help retrieval processes, as representations become more specific and more ‘*unique*’ (Hofmeister, 2011). However, emotional information might boost this effect because of its saliency (i.e. readers’ focus on emotional information (Herbert et al., 2008; Kanske & Kotz, 2007), its special role in processing, and its relevance for finding coherence within the text (Vega et al., 1996, Kneepkens & Zwaan, 1995). These facts may explain why we only found differences in retrieval times between emotional and bare representations.

Furthermore, we did not find differences between sentences including one or two adjectives for this (retrieval) region, showing that processing was not affected by the additional (non-emotional) adjective. Future studies should further investigate effects of information complexity on retrieval and whether there is a complexity threshold above which additional information does not lead to processing benefits, but rather to processing difficulties.

2.6. Conclusion

We found processing effects based on information load and the emotional value of information. In line with the study by Hofmeister (2011), effects were evident at encoding, when a mental representation of an either rich or bare noun phrase had to be constructed. Reading times for rich representations were slower, as more information led to more complex integration processes. Moreover, we also found retrieval effects indicating that more complex representations, specifically those including emotional characteristics, led to a better (faster) recall. In our study, bare representations took longer recall than emotionally qualified representations. Our results emphasize the prominent role of emotions in comprehension. Emotions are linked to the saliency of a representation,

most likely because of their role in establishing global coherence in text, and so emotionality plays an important role during processing.

3. Mixed emotions - The accessibility of emotions in character representations

Scarlett Child,

Jane Oakhill &

Alan Garnham

University of Sussex

Reference:

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3.1. Abstract

In chapter 2, we presented a sentence-processing experiment to give evidence that emotionally qualified entities are more salient than non-qualified entities. In a new set of experiments, we were interested in whether these results are relevant for text rather than sentence processing. Also, in the previous study, readers were only presented with one character at a time. In chapter 3, we aimed to investigate how readers deal with information about different characters and whether readers are more likely to assign new information of a certain type (emotional) to character representations that already include the same type of information. In three experiments, individuals were presented with texts about two characters, one of which was more elaborately described than the other. In Experiment 3.1 and 3.2, texts described a first character in an emotional situation. For Experiments 3.1 and 3.2, the second character was either emotionally neutral, or emotionally congruent or incongruent with the first character. Reading times were measured for text continuations that either matched or mismatched the emotional information about the first character. Both experiments found evidence that readers try to link new emotional information to a more elaborated character that is already emotionally specified (i.e., the first character). We found that readers also make emotional inferences about the second character and link new emotional information to their representation, but only when the explicit emotion does not correspond to the emotions of the first character. Experiment 3 tested whether the saliency of the first character was due to the amount of information or due to the type i.e. the emotional status of the information that was provided about the character. We found that saliency was affected by the valence of the emotional information, with negative emotions leading to more salient representations.

Keywords: Emotions, reading comprehension, characters, mental representations

3.2. Introduction

Many narratives tell us about events that do not necessarily take place at a single time or place and they might not always tell the story of a single character. Some narratives even go back and forth in time, change back to a place or switch between multiple characters. Readers might try and connect the individual storylines, to make sense of the text as a whole, however, some connections might be hard to identify at first. Research has focused on how readers build up different storylines and what information is used for a coherent representation of the text (e.g. Zwaan & Radvansky, 1998). Our current project adds to this large body of research, and asks whether readers automatically add new information to the representation that presents the best fit (with similar features or types of information). For our study, we will test whether readers attribute emotional information to an emotionally elaborated character, or whether they are able to compare new emotional information against several representations.

When we read texts, we build up mental representations about the events that we are presented with (van Dijk & Kintsch, 1983). In a coherent text, these individual events are related to one another and readers try to find the connections that link them to arrive at a representation of the entire text. The event-indexing model proposes that the relationships between events can be classified into five different dimensions: time, space, entity (character or object), motivation and cause. Comprehension is facilitated as readers are able to identify relationships between events i.e. the more information is shared across these dimensions, the easier is the encoding and integration of the new event (Zwaan, 2016; Gernsbacher, 1990).

The interest in the content of (or what is included in) a situation model is wide ranging and widely researched. Most researchers however, concentrate on the essence of a situation model (what is included). Our research aims to understand how readers process

changes or discontinuities in the model and in how far readers can keep different events separate from one another. The situation model as proposed by Zwaan (2016) is based on the notion that readers identify relationships between different events. This process is, however, based on the idea that the text is continuous and that events build on one another. As highlighted by Magliano, Zwaan & Graesser (1999) not all texts follow a continuous pattern, in which readers can identify these relationships easily. Magliano et al. (1999) argue that these discontinuities or *breaks* across several dimensions demand the building of a new model, which slows the reading and comprehension process. Researchers have found evidence for this assumption, but only for the temporal, spatial and intentional dimensions (Magliano et al., 1999). However, even though some researchers acknowledge that in texts, readers have to process information about multiple characters (Oatley, 1999), few or no studies have explored reading behaviour and comprehension when readers are faced with multiple characters. As argued by Zwaan and Radvansky (1998), readers keep characters that are explicitly mentioned (by name) in focus and they are able to track information that is associated with them. Our experiments assess whether readers monitor information about different characters and whether they follow the continuity principle (and are, hence, on a quest to find continuities between old and new information) and are therefore more likely to match new information of a certain type with a character representation that shares a high number of attributes (has similar attributes associated with them).

As mentioned previously, the event-indexing model suggests that readers try and form a coherent representation of the text using attributes that give information about a character's motivations and that readers search for causal relations between events. The emotions of a character can be a useful tool to understand these causal relationships and to comprehend the motivation behind the character's actions. For example, the character

has just learned that they won the lottery. Next, the reader learns that the character jumps up high and cries. In order to understand the link between those two events, readers need to make an inference about the character's emotional state. The text only becomes coherent when readers understand that the character is in a happy situation, that this emotional state (caused by the lottery win) is a reason for the jump, and that the cry is a happy cry. Also, the character's motivation behind the act of robbing the bank is to get money to improve the state of desperation. Hence, as highlighted by Zwaan (1999b) or de Vega, León & Díaz (1996), emotions create a link between different elements of a text for example by providing motivational and causal connections between events. Therefore, emotional information can play an important role for text comprehension. Several studies also found evidence that readers are able to track emotional information across the text (de Vega et al., 1996; Gygax, Oakhill & Garnham, 2003). However, it is important to note that emotions are not classified as a separate dimension of the event-indexing model (e.g. Zwaan, 1999b), due to their closeness to other dimensions. Hence, emotions are classified as attributes associated with the character dimension and they are caused by the characters' success or failure to achieve their goals.

As readers build up a coherent representation of the text that includes the information along different dimensions, they match new information with the existing representation. Matching information is easily integrated in the overall model as the previous information can be easily reactivated and attributes can be connected to one another. However, mismatching information leads to processing problems. In our study, we test the readers' ability to relate new information to different models of a situation, only one of which includes relevant or similar information. We believe that readers try and relate new information that matches with the type of information included in a

previous presentation with this (matching) representation rather than trying to match the new information with a representation that does not include (type-) related information.

To test this, we will present readers with information about two separate characters. One of these two characters will be presented in an emotional situation and hence their representation will include emotional attributes that will provide information about possible causes and explanations for their actions later in the text. In addition, a second character with no such emotional information will be introduced. We suggest that readers try to connect new emotional information that occurs later in the text (after the information about both characters) to the first emotionally more salient character. To test this, a sentence including an explicit emotion word matching or mismatching the emotion of the first character will be inserted. We believe that readers are faster when reading the emotional match, as this information is connected to and coherent with the representation of the emotionally elaborated character. We also predict that we will find slower reading times (mismatch effects) for emotional mismatches, even though this new information could be related to and interpreted as new information about the second less emotionally elaborated character. We believe that readers still try to connect the emotional content of the new information to the model of the first character, as readers are able to detect the similarity of the information type. We believe that the representation of the first character remains salient and therefore, the mismatch of information will lead to processing problems in form of mismatch effects. To see whether readers try to link the new information with the first, emotionally elaborated character, we manipulated the name following the emotion word. Readers should be fast at integrating the name of the emotionally elaborated character after an emotional match and slower at integrating their name after a mismatch. As we predict that readers attempt to link emotional information with the emotional character, we believe that reading times for the second character's

name are similar for emotional matches and mismatches, and slower compared to the first character' name after an emotional match. Experiment 3.1 will explore the reading behaviour when reading about multiple characters and readers' ability to link new information to representations with similar attributes as well as to representations with no such attributes.

3.4. Experiment 3.1

3.4.1. Method

3.4.1.1. Participants

Forty individuals were recruited at the University of Sussex. The data of two individuals could not be entered into the analysis due to technical problems, leaving a sample of 38 participants. Participants were native speakers of English and all were blind to the purpose of the study. Participants reported that they did not suffer from any reading disorder. Individuals gave information about their age, which was between 18 and 41 years ($M = 22.69$, $SD = 4.59$).

3.4.1.2. Items

Similar to the study by Gyga et al. (2003), text passages were generated that described a character in an emotional situation. The valence of the emotion (negative/positive) in each text, as well as the sex (male/female names) of the characters presented in the text, were counterbalanced over items. In the course of four to five sentences the reader learned about the situation and was able to build up knowledge about one character and the possible emotions experienced by him or her.

In contrast to Gyga et al. (2003), a second character (same sex as the first) was introduced in the main body of the text. The description of the second character was less

specific, and they were mentioned in a single sentence only. No emotional information was given about the new character.

In the sentence following the introduction of the new character, both characters were mentioned, and a relationship or something in common linking the two was established. These sentences made up the main body of the text. The emotions of the first character were only described implicitly, and the names of both characters consistently appeared only twice in this part (see example 3.1, part 1). Part 1 of each text was identical across conditions.

Example 3.1:

Part 1:

During the holidays, Sarah and her family were spending the day at an adventure park. The trip was a big surprise for her. She knew about this park before and always wanted to go on the big rollercoaster. She jumped excitedly up and down. Julia has been to the park before. Julia's and Sarah's parents used to be neighbours.

The experiment aims to test whether readers try to attach new emotional information characters who are already elaborated emotionally. Therefore, the final sentence first contained an explicit emotion (part 2, 'emotion word stage') matching or mismatching the emotion described for the first character in the text (part1). Match and mismatch of emotion (with regard to the first, more specific character) represents the first manipulation (IV) in our experiment.

Part 2 (emotion word stage):

Cond 1 and 2: *Full of enthusiasm*,

Cond 3 and 4: *Full of fear*,

As the second independent variable, the last part of the final sentence and, therefore, of the passage itself, contained either the name of the first specified, emotional character or the name of the second unspecified character ('name stage').

Part 2 and 3 (name stage):

Cond 1 - Emotional Match/ Emotional Character: *Full of enthusiasm, Sarah joined the queue for the rollercoaster.*

Cond 2 - Emotional Match/ Non-emotional Character: *Full of enthusiasm, Julia joined the queue for the rollercoaster.*

Cond 3 - Emotional Mismatch/ Emotional Character: *Full of fear, Sarah joined the queue for the rollercoaster.*

Cond 4 - Emotional Mismatch/ Non-emotional Character: *Full of fear, Julia joined the queue for the rollercoaster.*

In the first condition, the emotion presented in the text (part 1) matched the emotion presented in the final sentence (part 2). Also, the character experiencing the emotion was mentioned in the final part of the passage (part 3), so that the last sentence overall matched the context of the text. Therefore, we predicted that reading times would be fastest, and responses as to whether the continuations match the context would be most positive, in this condition.

For the second condition including the name of the second, less elaborated character, the first response after the emotion (and the reading time pattern) should be similar to the first condition. However, as it is assumed that the reader's mental representation of the first character is more salient, the name of the second character should lead to longer reading times.

For emotional mismatches, we expect longer reading times (conditions 3 and 4) than for emotional matches (conditions 1 and 2). Also, for part 3, responses should mirror mismatch effects and the reader's confusion as the emotion does not match with the

previously established mental representation of the first character. However, readers might be inclined to assign mismatching emotional information to the second (neutral) character (*Julia*), which would lead to processing benefits in the fourth condition.

In addition to 32 experimental items, we included 16 distractor items. These fillers were taken from Gygax et al. (2003) and were transformed so that each of the fillers contained at least one character experiencing an emotion. For the filler items, the character name presented in the last sentence did not appear in the previous text.

3.4.1.3. Design

The experiment had a 2 x 2 design. First, we manipulated whether the explicit emotion word matched or mismatched the emotional state of the first character (match/mismatch). Second, after the emotion word was presented, the name of either the first or the second character followed within the last sentence (first/second character name). Each participant was presented with one of four lists that were generated following a Latin-Square design. Each list contained all experimental and filler items, eight experimental items per condition, with each item occurring only once. Reading times were measured for text continuations in two parts: once after the emotional match/mismatch and again after the character name was presented. Also, participants provided two ratings judging whether the continuations (part 2 and part 3) followed on from what they had read before.

3.4.1.4. Procedure

Items were presented in a pseudorandom (computer-generated) order on a PC screen (Dell, 17 inches; 24 font black on white background) using the software E-Prime 2 (Schneider, Eschman & Zuccolotto, 2012). Reading times for part 1 and for the two final parts of the passage (2 and 3) as well as responses to the offline task were recorded.

After an introduction and three practice trials, participants were presented with 48 items. For each trial, the main body of the text passage was presented first. After finishing reading this section of the passage, the first part of the final sentence (part 2, containing the explicit emotion either matching or mismatching the previous text in the case of the experimental items) was presented. After reading part 2, participants were asked to make a decision as to whether it followed on from what they had read before (*Did this part follow on from the previous text?*). Answers were given on a keyboard by pressing either ‘yes’ (part 2 followed on from the text) or ‘no’ (part 2 does not follow on from the text). Following their response, the last part of the sentence, part 3, containing the name of one of the characters was presented. Again, participants were asked to indicate whether the continuation was consistent with the previous parts of the text or not. Text parts were presented non-cumulatively (i.e. individually). There was not time limit for responses, but the participants were encouraged to answer as quickly as possible. After the final response, there was a 2 second interval before participants were presented with the next trial. Each participant was presented with the same number of items in each condition. Each item occurred in only one condition per list and each list was presented ten times in the course of the experiment.

3.4.2. Results

3.4.2.1. Reading times

Reading times for the two parts (containing emotional match/mismatch and character names) of the text were analyzed using general linear mixed models. The data for each part were normalized using a logarithmic (natural log) transformation. An outlier removal procedure was performed on logarithmic reading times. Data points that were more than 2.5 standard deviations above or below the overall mean within each section

of text (2 and 3) were excluded from the analysis, leading to the deletion of 1.01% for part 2 and 1.62% of the data for part 3.

In order to control for effects of text length, a regression analysis was performed on per character reading times for each participant. Residuals were calculated on a trial-by-trial basis, giving information about the deviation from the average reading time (per character for each participant). Logarithmic residual reading times were analysed using linear mixed effect models in R (using restricted maximum likelihood estimates as default, R Studio Team, 2015, using the lme4 package, Bates, Maechler, Bolker & Walker, 2015). Probability values were calculated with the Satterthwaite approximation in the lmeTest package (Kuznetsova, Brockhoff & Christensen, 2015). Models included emotional match/mismatch for part 2 and part 3 and character name (emotional/neutral) for part 3 as fixed effects. In addition, participants and items were included as random effects (intercepts⁴ and slopes). For each analysis, we assessed the model fit (to find the best random factor structure) using convergence criteria, the AIC (Akaike Information Criterion, Bates, 2010) and PCA (RePsychLing package, Baayen, Bates, Kliegl & Vasishth, 2015). Models that met the converge criteria, generated the lowest AIC and that were not subject to overfitting (Bates, Kliegl, Vasishth & Baayen, 2015) are reported. Sum constrasts were set and for pairwise comparisons, the lsmeans package (Length, 2016) was used. Also, we used the sjPlot package to generate tables showing LMM coefficients (Lüdtke, 2018).

Part 2, the emotion word stage, presented either a matching or a mismatching emotion in relation to the previous text and the main (first) character. Reading times were

⁴ Because of known, and unresolved, problems in the reporting of parameter estimates for lmer models with no random intercepts (see Walker, 2014; Bolker, 2013), we focused on models that included random intercepts. For the RT data estimates of the variability of the intercepts for participants were correct at 0.

faster when the emotion word matched ($M = 2152$, $SD = 1134$) rather than mismatched ($M = 2555$, $SD = 1306$) the emotional state of the first character (see Table 3.1).

	Log Residual Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.00	-0.04 – 0.04	.995
Emotional Match	0.09	0.06 – 0.11	<.001
Random Parts			
σ^2		0.157	
τ_{00} , Subject		0.000	
τ_{00} , Exp		0.004	

Table 3.1. LMM coefficients and effects of emotional match/mismatch on reading times, part 2, Experiment 3.1

For the final part of the sentence, the name stage, reading times were influenced by emotional match and by whether the name of the first or second character occurred (see Table 3.2).

	Log Residual Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	-0.00	-0.05 – 0.05	.988
Name	0.06	0.03 – 0.09	<.001
Emotional Match	0.06	0.03 – 0.09	<.001
Name:Emotional Match	-0.04	-0.07 – -0.01	.005
Random Parts			
σ^2		0.230	
τ_{00} , Subject		0.000	
τ_{00} , Exp		0.010	

Table 3.2. LMM coefficients and effects of emotional match/mismatch and emotional/neutral characters on reading times, part 3, Experiment 3.1

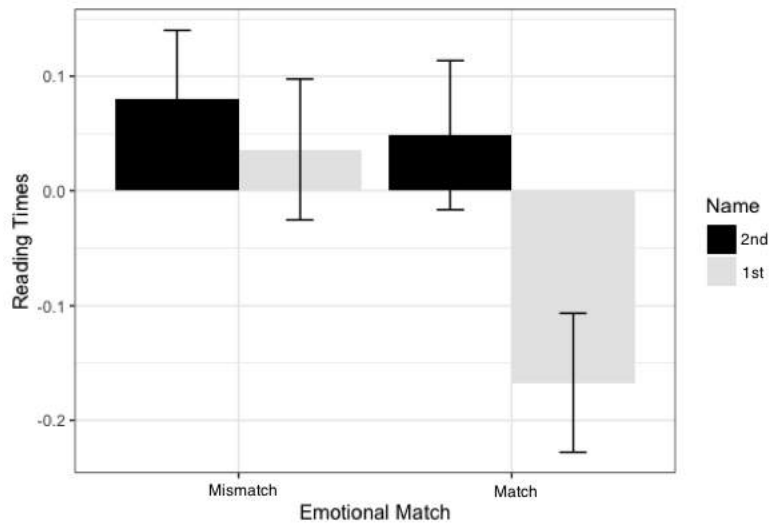


Figure 3.1. Reading Times for emotional match/mismatch and names (1st/2nd character, \pm 1 SE

Again, reading times were faster for emotional matches with regard to the first emotional character (match: $M = 2763$, $SD = 1701$; mismatch: $M = 3100$, $SD = 1916$; see Table 3.2). Also, reading times were faster when the name of the emotional ($M = 2752$, $SD = 1751$) rather than that of the neutral ($M = 3113$, $SD = 1869$) character occurred (see Table 3.2). The interaction between emotional match and character name was also significant (see Table 3.2). Participants read faster for emotional matches in combination with the name of the first emotional character ($M = 2444$, $SD = 1494$) compared to continuations including the name of neutral characters (regardless of emotional match: $M = 3077$, $SD = 1832$; $\beta = 0.22$, $SE = 0.04$, $t(944) = 4.98$, $p < 0.001$, or mismatch: $M = 3150$, $SD = 1909$; $\beta = 0.25$, $SE = 0.04$, $t(944) = 5.67$, $p < 0.001$) and continuations including the name of emotional characters in combination with an emotional mismatch ($M = 3051$, $SD = 1925$; $\beta = 0.21$, $SE = 0.04$, $t(944) = 4.74$, $p < 0.001$). The analysis did not reveal reading time differences between continuations that included the name of the second character or emotional mismatches ($p > 0.1$, see Figure 3.1).

3.4.2.2. Coherence Judgements

Judgements as to whether the new information after the main body of the text followed on from what was read before were analysed. Participants gave a judgment twice for each trial, once after the explicit emotion was presented and once after the complete sentence including the name had been processed. Responses were analysed using linear mixed models. We used the same procedure for model selection that was used for the reading time data.

When the judgement was made after the emotion word, participants gave more positive responses when the emotion matched ($M = 0.86$, $SD = 0.35$; mismatch: $M = 0.27$, $SD = 0.45$) the first, more specifically described, character (see Table 3.3).

	Coherence Judgement		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.57	0.51 – 0.62	<.001
Emotional Match	-0.29	-0.35 – -0.24	<.001
Random Parts			
σ^2		0.111	
τ_{00} , Subject		0.017	
τ_{00} , Exp		0.008	

Table 3.3. LMM coefficients and effects of emotional match/mismatch on coherence judgements, part 2, Experiment 3.1

The decisions given by the participants as to whether the final part of the text matched or mismatched the previous part of the text were not influenced by the match/mismatch of the previously mentioned emotion, but by the character name that occurred in the last part (see Table 3.4). Judgements were more positive for continuations including the first emotional character name ($M = 0.71$, $SD = 0.45$) than for the second neutral name ($M = 0.51$, $SD = 0.50$). The interaction between emotional match and

character name was significant (see Table 3.4), showing that positive responses were exclusively more frequent for continuations that included the name of the first character and an emotional match ($M = 0.82$, $SD = 0.38$) compared to an emotional mismatch ($M = 0.48$, $SD = 0.50$; $\beta = 0.23$, $SE = 0.05$, $t(57) = 4.56$, $p < 0.001$) or continuations including the name of the second character (match: $M = 0.60$, $SD = 0.49$; $\beta = 0.34$, $SE = 0.05$, $t(57) = 6.96$, $p < 0.001$; mismatch: $M = 0.55$, $SD = 0.50$; $\beta = 0.28$, $SE = 0.06$, $t(28) = 4.82$, $p < 0.001$). These findings are in line with the reading time data for which we found faster reading times for continuations that included the first emotional character name in combination with an emotional match.

	Coherence Judgement		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.61	0.54 – 0.68	<.001
Emotional Match	-0.04	-0.08 – 0.00	.070
Name	-0.10	-0.14 – -0.06	<.001
Match:Name	0.08	0.05 – 0.10	<.001
Random Parts			
σ^2		0.175	
τ_{00} , Subject		0.018	
τ_{00} , Exp		0.013	

Table 3.4. LMM coefficients and effects for emotional match/mismatch and emotional/neutral characters on coherence judgements, part 3, Experiment 3.1

3.4.3. Discussion

In Experiment 3.1 we explored whether readers build up a preference towards, and try to integrate new emotional information with, a character that shared attributes of the same type of information i.e. a character whose emotional state had already been

indicated, albeit indirectly. In order to test our assumption, a match/mismatch paradigm (Gygax et al. 2003) was used. In contrast to Gygax et al. (2003) we not only manipulated whether the emotion matched with the character presented in the text, but we added another character who was emotionally neutral. We did this to investigate whether the emotionally more salient representation remains in the reader's focus, regardless of new, emotionally neutral, input. Also, we assumed that readers would try to link emotional information to a character that is emotionally developed, and for whom the emotion is already quite specific, rather than making an emotional inference about a neutral character. We therefore expected slower reading times and mismatch effects when readers failed to link a final explicit emotion word to the first emotionally-elaborated character.

In line with this prediction, we found match and mismatch effects depending on whether the emotion presented in the final sentence matched the more salient first character or not. Readers did not appear to attribute emotional information to the second neutral character, even when that information was inconsistent with the suggested emotional state of the already emotional character. Therefore, they needed longer to process information that was inconsistent with what they assumed about the first, emotional, character.

We also investigated what happened when the matching (to the first character) or mismatching emotion was explicitly linked to second neutral character at the name stage. As predicted, having re-focussed on the emotional representation of the first character when reading the explicit emotion, readers showed mismatch effects when the name of the neutral character followed, even when the emotion presented in part 2 did not match the inferred emotional state of the first character. The only condition in which readers did not show signs of processing problems was for sentences that were consistent with the first character in terms of emotion word and character name. This suggests that readers

did not make emotional inferences about the second (neutral) character, but that they preferred to maintain the connection between the emotion and the first character, which was more straightforward and plausible.

Our results can be interpreted taking into account previous research indicating the special role of emotions in text comprehension (e.g. de Vega et al., 1996; Gygax et al., 2003). Gygax et al. (2003) found that readers are able to monitor a character's emotion (whether explicit or implicit) and that inconsistencies (emotional mismatches) lead to processing difficulties. As predicted by de Vega et al. (1996), emotions are not only relevant for local but for global comprehension and they are used as a '*glue*' that links information throughout the text. The global relevance of emotional information within a representation is supported by our findings, as the integration of a new, emotionally neutral, character did not change the preference for the first emotionally salient character. Mismatch effects were still evident after the neutral character was introduced, even though the mismatching emotion could have, in principle, been attributed to the neutral character. The finding that readers were slower when they read the second character's name in combination with an explicit emotion shows that they try to connect new information to the character that is more emotionally salient and that emotional information is already part of the mental representation. Readers ascribe new emotional information to the character that is already linked to a clear emotional state (to the same type of information) rather than to a character that does not share attributes of the same (emotional) type.

The reading time results were supported by participants' ratings of whether the text was coherent or not. Only the conditions in which the explicit emotion word matched the preceding text were rated as coherent (emotion word stage). Also, as in the reading time data, the condition in which there was an emotion match and a character name match

(name stage) resulted in more positive ratings than the other conditions in which either the character or the emotion (or both) mismatched those of the more developed character. In these mismatch conditions, participants were unsure about whether the passage was coherent, as the ratings (around 50% for ‘yes’ and ‘no’) demonstrate. These results suggest that there is a preference for information that is uniformly consistent with the emotionally more elaborated character.

The second aim of our study was to understand whether the strength of the emotional attribute influences the preference towards a character. Therefore, a second experiment was conducted to test whether the focus on a character such as that introduced in the first part of the passages of Experiment 3.1 is mitigated by the introduction of another character with a less developed emotional description. In Experiment 3.2, we therefore manipulated the emotional status of the second character. The emotion of the second character was similar to, or different from that of the first character, or the description of the second character was neutral, as in Experiment 3.1. The aim was to test whether readers build up a new emotional representation for the second character, and whether this representation changes the reader’s focus when the explicit emotion word is presented. As in Experiment 3.1, the *amount* of information about each character was unequal, to test whether readers’ preferences are influenced by the clarity and specificity of emotional traits.

If readers are able to rapidly infer the emotion of the second character and link it to the explicit emotion word, then mismatch effects should not occur when the emotion mismatches the first character, but matches the second. However, it is likely that the representation of the first character will remain more salient because there is more, and more specific, emotional information attached to that character. The presence of an explicit emotion word might, therefore, lead again to a rapid re-focusing on the first

character. In addition, if the emotional information provided for the second character changes the focus pattern found in Experiment 3.1, there would be evidence that emotional information is treated differently from neutral information in that it can influence the focus of the reader.

3.5. Experiment 3.2

3.5.1. Method

3.5.1.1. Participants

The University of Sussex subject pool was used to recruit participants. Forty-eight participants took part in the study with a mean age of $M = 21.23$, $SD = 4.3$ and age range of 18 - 46 years. Participants who took part in Experiment 3.1 were not permitted to take part in the study. All participants were asked about their history of reading problems. Participants who indicated any reading disorders were excluded from the study.

3.5.1.2. Design

The experiment had a 2 x 2 x 3 design, with the independent variables from Experiment 3.1: emotional match (first character), and name of first or second character. In addition, we manipulated the emotional state of the second character to be either similar or dissimilar to the first or neutral, resulting in twelve conditions overall.

Following a Latin Square Design, twelve experimental lists were created, with each item in only one condition in each list, and three items per condition per list. In addition to 36 experimental items, each list included 16 filler items for distraction purposes. As in Experiment 3.1, the order of the items was pseudo-randomised for each participant separately.

We measured reading times for part 2 and part 3 of the text. Again, we asked participants to give ratings about whether the continuation followed on from what was

read before. These ratings were again given once after the emotion word was presented and a second time after the final part of the last sentence.

3.5.1.3. Items

The items used in this study were based on the passages used in Experiment 3.1. For the new variable in this experiment, the sentence in which the second character was introduced was manipulated. In contrast to Experiment 3.1, where the second character was emotionally neutral, sentences about the second character (character 2) now included emotional information which either had the same valence as that associated with the first character (character 1), or the opposite valence. In the third condition, the same sentences used in Experiment 3.1, with non-emotional information about the second character, were presented (see Example 3.2, below).

Example 3.2.

Part 1:

During the holidays, Sarah and her family are spending the day in an adventure park. The trip was a big surprise for her. She knew about this park before and always wanted to go on the big rollercoaster. She jumps excitedly up and down.

Condition 1: Julia is holding her mother's hand. (neutral)

Condition 2: Julia gets nauseous just thinking about a big rollercoaster. (different)

Condition 3: Julia's eyes light up just thinking about the rollercoaster. (same)

... Julia's and Sarah's parents have been friends for years.

Each passage described a first character experiencing a negative or positive emotion, without mentioning an explicit emotion word (part 1). A sentence introducing a second character and a sentence mentioning the link between the first and second character followed the first part. As in the previous experiment, an emotion

word/expression congruent or incongruent with the emotion of the first character was presented (see part 2, ‘emotion word stage’):

Part 2:

Full of enthusiasm / Full of fear

Part 3, the remaining of the sentence beginning with the emotion, presented the name of the first or second character (‘name stage’).

Part3:

Sarah/ Julia joins the queue for the rollercoaster.

3.5.1.4. Procedure

The procedure was the same as for Experiment 3.1.

3.5.2. Results

3.5.2.1. Reading Times

As in Experiment 3.1, we logarithmically transformed the reading time data. Then, 1.56% of the data points were excluded from the analysis for part 2, and 1.56% for part 3 (as they were outliers more than 2.5 standard deviations from the overall mean for each part). Residuals were calculated and logarithmic residual reading times were used in the analysis. The data were analysed using general linear mixed models. For contrasts sum contrasts were used (with the neutral condition was used as the baseline level for the emotional state of the second character). We included the same factors as in Experiment 3.1. As an additional fixed factor, we included the emotional state of the

second character (neutral, congruent or incongruent to the first character). The procedure was the same as was outlined in Experiment 3.1.

Reading times part 2 (emotional word stage)

We found a main effect of whether the explicit emotion word matched or mismatched the emotion of the first character (see Table 3.5). Participants read faster when the emotion word matched the emotion of the first character ($M = 2323$, $SD = 1203$, than when it mismatched: $M = 2640$, $SD = 1341$).

	Log Residual Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.00	-0.03 – 0.03	.998
Emotional Match	0.07	0.04 – 0.10	<.001
IncongCh	0.00	-0.03 – 0.03	.961
CongCh	0.02	-0.01 – 0.04	.188
Emotional Match:IncongCh	0.01	-0.02 – 0.03	.641
Emotional Match:CongCh	-0.02	-0.05 – 0.00	.084
Random Parts			
σ^2		0.130	
τ_{00} , Subject		0.000	
τ_{00} , Exp		0.004	

Table 3.5. LMM coefficients and effects of emotional match/mismatch and emotional states (neutral, incongruent, congruent) of second characters on reading times, part 2, Experiment 3.2

There was no interaction between the emotional match or mismatch (first character) and the new variable of the second character's emotion (matching, mismatching the emotion of the first character or emotionally neutral) (see Table 3.5). Even when the emotion of the second character was different from the emotion of the first character, and was therefore congruent with the mismatch emotion, mismatch effects with the first character were still evident.

Reading times part 3 (name stage)

	Log Residual Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.00	-0.04 – 0.04	.994
Emotional Match	0.02	0.00 – 0.05	.037
IncongCh	-0.00	-0.03 – 0.03	.989
CongCh	-0.00	-0.03 – 0.03	.933
Name	-0.00	-0.03 – 0.02	.840
Emotional Match:IncongCh	-0.00	-0.04 – 0.03	.819
Emotional Match: CongCh	-0.01	-0.05 – 0.02	.422
Emotional Match:Name	-0.02	-0.04 – 0.01	.175
IncongCh:Name	-0.00	-0.03 – 0.03	.917
CongCh:Name	0.01	-0.02 – 0.05	.456
Emotional Match:IncongCh:Name	-0.00	-0.03 – 0.03	.973
Emotional Match:CongCh:Name	0.02	-0.01 – 0.05	.226
Random Parts			
σ^2		0.212	
τ_{00} , Subject		0.000	

Table 3.6. LMM coefficients and effects for emotional match/mismatch, emotional states (neutral, incongruent, congruent) of second characters and first/second character name on reading times, part 3, Experiment 3.2

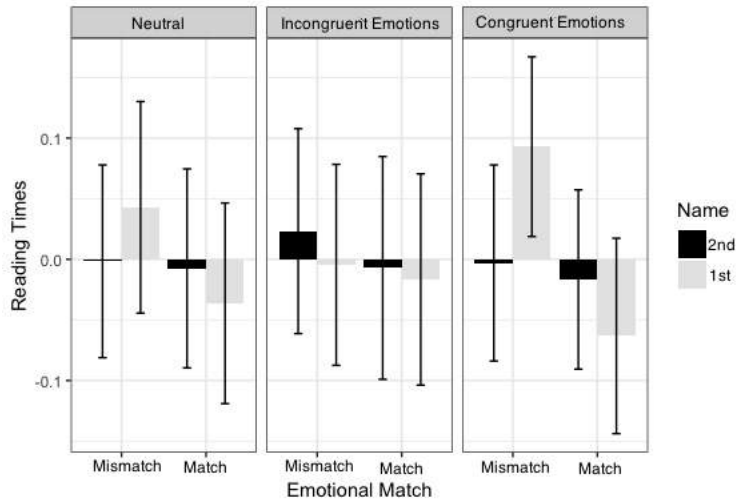


Figure 3.2. Reading Times for all conditions: characters with neutral, congruent and incongruent emotions, match/mismatch and 1st/2nd character name, +/- 1 SE

We did find an effect of emotional match/mismatch as a spill over from before, with longer reading times for emotional mismatches ($M = 3220$, $SD = 2037$); than matches ($M = 3092$, $SD = 2027$) (see Table 3.6). We did not find effects of the other experimental manipulations. Participants' reading times were not influenced by the name of the character following the emotion (see Table 3.6). As can be seen in Figure 3.2, one condition differed numerically from the other conditions in that participants needed longer to read the first character's name. In this condition, the information about the second character matched with the emotion of the first. However, the emotion presented explicitly does not match that of either of the characters. When reading the name of the first character after the emotional mismatch, processing difficulties were evident. We did not find a similar trend for the similar condition, but with the name of the second character in part 3 (see Table 3.7 for means).

	Raw Reading Times	
	<i>Mean</i>	<i>SD</i>
Condition		
Neutral : Match : Name1	3187	2419
IncongCh : Match : Name1	2959	1763
CongCh : Match : Name1	2939	1877
Neutral : Mismatch : Name1	3315	2266
IncongCh : Mismatch : Name1	3153	2077
CongCh : Mismatch : Name1	3374	1902
Neutral : Match : Name2	3256	2242
IncongCh : Match : Name2	3233	2062
CongCh : Match : Name2	2983	1741
Neutral : Mismatch : Name2	3189	1974
IncongCh : Mismatch : Name2	3188	2061
CongCh : Mismatch : Name2	3091	1916

Table 3.7. Raw reading times means for all conditions: second character emotion (neutral/incongruent/congruent), emotional match/mismatch, name of first/second character, Experiment 3.2

3.5.2.2. Coherence judgements

We analysed coherence judgements that were given after reading part 2 and part 3 of the text, using the same procedure as described in Experiment 3.1. As for reading times, we included the same fixed factors as for Experiment 3.1 as well as the new manipulation of the second character's emotion.

Coherence Judgements after part 2 (emotional word stage)

For the judgments, we found effects of match/ mismatch of the explicit emotion word (to the first character) and of the emotions of the second character (see Table 3.8).

	Coherence Judgement		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.67	0.62 – 0.72	<.001
Emotional Match	-0.22	-0.25 – -0.18	<.001
IncongCh	-0.04	-0.07 – -0.02	.002
CongCh	0.13	0.10 – 0.17	<.001
Emotional Match:IncongCh	-0.06	-0.08 – -0.03	<.001
Emotional Match:CongCh	0.17	0.15 – 0.20	<.001
Random Parts			
σ^2		0.117	
τ_{00} , Subject		0.011	
τ_{00} , Exp		0.010	

Table 3.8. LMM coefficients and effects for emotional match/mismatch and emotional states (neutral, incongruent, congruent) of second characters on coherence judgments, part 2, Experiment 3.2

We found a main effect of emotional match (see Table 3.8). Participants gave more positive judgements for emotional matches ($M = 0.89$, $SD = 0.32$) with regard to the first character than for emotional mismatches ($M = 0.46$, $SD = 0.50$). After the emotion word, judgements were also more positive for texts in which the second character had different emotions from the first ($M = 0.80$, $SD = 0.40$) (compared to neutral: $M = 0.64$, $SD = 0.48$, or the same emotions: $M = 0.59$, $SD = 0.49$, see Table 3.8). An interaction of the two variables was also significant (see Table 3.8). When the emotions of the second character were different from the first (and matched the emotion word) ratings were higher ($M = 0.76$, $SD = 0.43$) than when the emotion word did not match either of the characters ($M = 0.26$, $SD = 0.44$; $\beta = 0.51$, $SE = 0.04$, $t(96) = 13.9$, $p < 0.001$). When the

emotion word matched the first character, there were no differences in judgements as a function of emotional state.

Coherence Judgements after part 3 (name stage)

Participants rated the continuations differently according to emotional match (match: $M = 0.67$, $SD = 0.47$; mismatch: $M = 0.55$, $SD = 0.50$) and the name (first: $M = 0.64$, $SD = 0.48$; second: $M = 0.58$, $SD = 0.49$) occurring after the emotion (see Table 3.9).

	Coherence Judgements		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.61	0.55 – 0.66	<.001
Emotional Match	-0.06	-0.09 – -0.04	<.001
IncongCh	-0.00	-0.03 – 0.03	.937
CongCh	-0.04	-0.07 – -0.01	.008
Name	-0.03	-0.05 – -0.01	.005
Emotional Match:IncongCh	0.00	-0.03 – 0.03	.903
Emotional Match:CongCh	0.03	0.00 – 0.06	.045
Emotional Match:Name	0.08	0.06 – 0.10	<.001
IncongCh:Name	-0.03	-0.07 – -0.00	.038
CongCh:Name	0.02	-0.01 – 0.05	.295
Emotional Match:IncongCh:Name	-0.03	-0.07 – -0.00	.033
Emotional Match:CongCh:Name	0.08	0.05 – 0.11	<.001
Random Parts			
σ^2		0.197	
τ_{00} , Subject		0.009	
τ_{00} , Exp		0.016	

Table 3.9. LMM coefficients and effects for emotional match/mismatch, emotional states (neutral, incongruent, congruent) of second characters and name (first/second) on coherence judgments, part 3, Experiment 3.2

There was a three-way interaction among the three factors, i.e. the emotional status of the second character, the explicit emotion word (match/mismatch) and the name presented in the final sentence (match/mismatch, see Table 3.9). This interaction is shown in Figure 3.3.

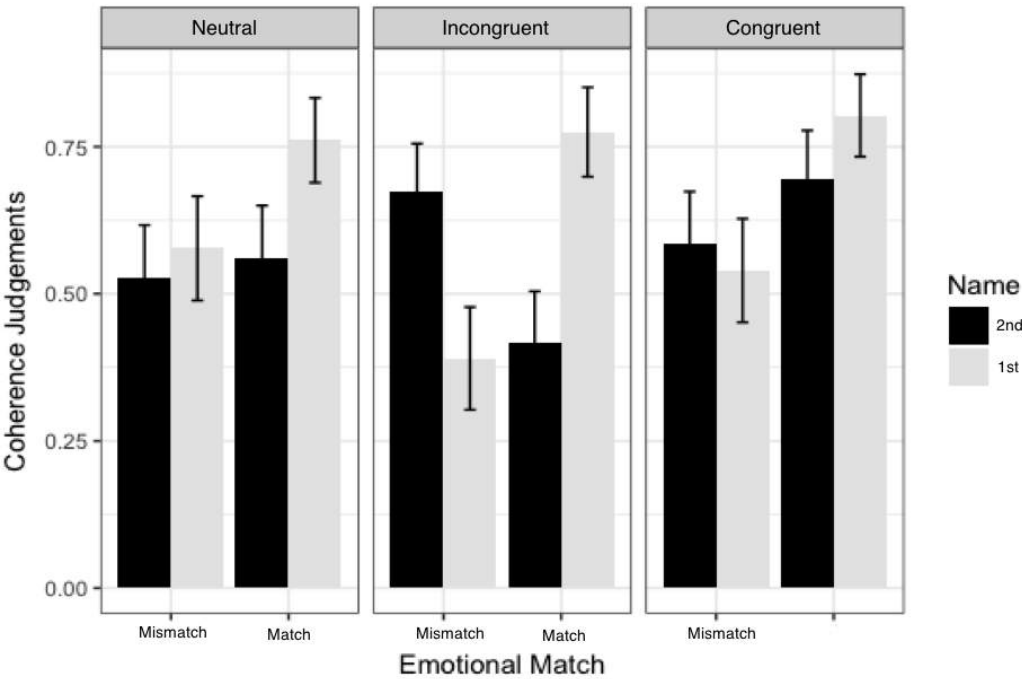


Figure 3.2. Coherence judgements for emotional matches and character names (first more elaborated; second less elaborated); left for neutral, mid for incongruent second characters, and right for congruent second characters, Experiment 3.2, (± 1 SE)

For the conditions in which the emotions of both characters were the same (or the second character was neutral) participants gave highest ratings for the continuation in which the name and the emotion matched the first character, which is similar to the results of Experiment 3.1.

For the conditions in which the emotions of the characters did not match (the second character had different emotions from the first), participants rated conditions

equally high where the emotion either matched the first or second character. The pattern suggests that *after* reading participants had fully processed the explicit emotions and that they were able to link them with the appropriate character.

3.5.3. Discussion

Experiment 3.2 was conducted to test whether readers maintain a preference towards a character that is more strongly associated with a certain type of information (i.e. in this case emotional information), rather than switching to another emotionally less well-specified character. It also tested whether the reader's focus on and preference for a more elaborated emotional character can be changed by new emotional information about another character: is emotional information special in that it controls and guides readers' attention? We had not found evidence for such a switch in Experiment 3.1, in which the information about the second character was emotionally neutral.

We found reading time mismatch effects when the explicit emotion did not match the emotion of the first, emotionally elaborated, character. Crucially, mismatch effects were evident regardless of the second character's emotional state, whether neutral, similar to or different from that of the first character, though numerically the effect was smaller when the second character's emotional state was different. However, no mismatch effect was found for the condition in which the explicit emotion word matched the first character but mismatched the second character. The findings indicate that readers try to connect the explicit emotion to the more elaborated character despite the more recent presentation of a less emotionally qualified character. The emotional information about the second character did not affect the focus on the first character. Judgements about the goodness of the continuation suggest that readers were able, to some extent, to perceive when the explicit emotion matched the emotion of the second character, but only when the

emotions of the first and second character were different. Additionally, according to the rating data, participants did not spot inconsistencies between the emotion of the second character and the explicit emotion when the latter matched that of the first character.

Readers reacted to inconsistency between the explicit emotion and the first character even when there was no inconsistency with the second character. We assume that the amount of (emotional) information about the first character may cause its representation to be significantly richer, and therefore more salient and in focus than that of the second character (Cook, Guéraud, Was, & O'Brien, 2007). Also, we believe that readers are sensitive to the type of information and try to link new information of a certain type to the representation that shares more traces of the same type of information.

Considering the reading times for part 3 (name stage), participants read all sensible conditions at a similar speed. Reading times were similar for the name of the first or the second character following an explicit emotion word that was consistent with either of the character representations. This means that readers are able to match new emotional information with either of the preceding character representations, and that the focus can shift from the more elaborated character to another in order to integrate the continuation with the preceding text.

For most conditions, the explicit emotion could be logically linked to either of the characters. However, in two conditions the explicit emotion did not match either of the characters. In these conditions, it might be thought that readers should process either of the names equally slowly. However, this was not the case. Longer reading times were found only when the name of the first character followed the inconsistent emotion (compared to all other conditions). This effect was not found when the name of the second character was presented. We assume that readers still try to reconcile the explicit emotion with the emotional state of the first character. When they perceive a mismatch with the

character in focus, readers shift their attention and assume a match of emotion with a representation of a secondary character. In the case of the ratings, readers showed an ability to match the emotions to the relevant character, regardless of how much information had been given about that character.

Experiments 3.1 and 3.2 showed that readers try to integrate new information into their representation of the more elaborated character, i.e. a character that shares more pieces of information of the same type. However, when there is a mismatch of information with the more elaborated representation, readers are able to match new information against a second less elaborated representation. In a final experiment, we were interested in whether the emotional status of the more elaborated character (and not the amount of information alone) was responsible for the readers' tendency to attribute new information to the first representation. We therefore tested whether the emotional information provided with the more elaborated character caused the saliency of the first representation and therefore the pattern of results outlined in Experiments 3.1 and 3.2. Hence, in Experiment 3.3 we included not only passages in which the more elaborated character experienced an emotional situation (and that hence included an emotional match/mismatch) but also, we added passages in which the more elaborated character was (comparatively) emotionally neutral (with a neutral information match/mismatch). We expected that emotional information would add to the saliency of a more elaborated character so that readers would have an increased tendency to integrate new information with the first (emotionally elaborated) character.

3.6. Experiment 3.3

3.6.1. Methods

3.6.1.1. Participants

We recruited forty participants via the Sona participant pool of the University of Sussex. For their participation, participants were either paid or received course-credit. Participants' age ranged from 18 – 28 years, with $M = 20.73$, $SD = 2.58$. Participants did not take part in either Experiment 3.1 or in Experiment 3.2. All volunteers were native speakers of English, with no sign of reading difficulties or disorders. All individuals were blind as to the purpose of the experiment.

3.6.1.2. Items

We used the same 32 passages as in in Experiment 3.1. For each item, we kept the version that introduced a first character in an emotional state (i.e. sixteen items suggesting a negative emotion and sixteen items a positive emotion) and created a new version that described the character in a neutral emotional state (avoiding emotional details). Again, after the introduction of a first character, a second (always neutral, see Experiment 3.1) character was introduced in a less elaborated way (see example 3.3). Also, a link between the two characters was explained in a single sentence.

Example 3.3.

Part1: Introduction of characters:

a) Emotional (positive)

During the holidays, Sarah and her family were spending the day at an adventure park. The trip was a big surprise for her. She knew about this park before and always wanted to go on the big rollercoaster. She jumped excitedly up and down. Julia has been to the park before. Julia's and Sarah's parents used to be neighbours.

b) Neutral

During the holidays, Sarah and her family were spending the day at an adventure park. The trip was not a surprise for her. She knew about this park before and heard about the

big rollercoaster. She was watching people standing in the queue. Julia has been to the park before. Julia and Sarah's parents used to be neighbours.

Following on from the first part, the second part of the passage included an information match or mismatch, that was either related to the emotion described (implicitly) in the text for the emotional passages or related to a factual detail in the text for neutral passages. Participants were either presented with information that followed on logically or sensibly from the previous section of the text and the description of the first character for the match condition or were presented with information that could not easily be linked to the first emotionally more elaborated character for the mismatch condition:

Part 2: Information Match/Mismatch

- a) Emotional Match: *Full of enthusiasm*,
Emotional Mismatch: *Full of fear*,
- b) Neutral Match: *Together with her parents*,
Neutral Mismatch: *Together with her friends*,

The third and last part of the passage, followed on directly from part 2 and continued the last sentence of the passage, starting with the name of the first more elaborated or second less elaborated character:

Part 3: Character Name (more elaborate/less elaborate)

- a) *Sarah joined the queue for the rollercoaster.*
- b) *Julia joined the queue for the rollercoaster.*

In addition to our experimental items, we included the same 16 filler items as used in our previous experiments.

3.6.1.3. Design

The experiment had a 2 x 2 x 3 design. First, with regard to the emotional status of the character, passages were designed so that the first part either introduced the first more elaborated character in an emotional (divided into positive and negative) or in a neutral situation. Half of the items described a neutral and the other half described an emotional character. Half of the emotional passages described characters in a positive emotional situation, the other half portrayed a negative situation, leading to an unbalanced design. Second, we included an information match or mismatch in which the continuation from the first part either included the explicit emotion word that matched or mismatched the emotional valence suggested in the text for the emotional passages, or it included a sensible or implausible factual piece of information in the neutral passages. Third, the final part of the text concluding the last sentence included the name of either the more elaborated first or the less elaborated second character.

Each text occurred in each of the twelve conditions (emotional (positive/negative) or neutral; containing match or mismatch; containing name of either character). Following a Latin Square Design, eight lists were created containing all (thirty-two) experimental items with each passage occurring in only one condition. Therefore, each list presented four items in the same condition. Filler items were added to each list, so that all lists contained a total of 48 items.

Each individual participant was presented with one list (i.e. all items, all conditions only one condition per item). Similar to the previous experiments, reading times were measured for parts 2 and 3 of each text. In addition, individuals gave two coherence judgements (*yes* or *no* answers), once after the second part and once after the third part of the text.

3.6.1.4. Procedure

The procedure was the same as in Experiment 3.1 and in Experiment 3.2.

3.6.2. Results

3.6.2.1. Reading Times

The data were transformed and analysed as explained in Experiments 3.1 and 3.2. Outliers were removed for each of the two parts individually. We removed outliers for data points more than 2.5 standard deviations from the overall mean. In total, 1.56% for part 2 (the emotion word), and 1.33% for part 3 were removed. As in previous experiments, we calculated residual log reading times in order to counteract word length effects by using linear regressions (by participant). Linear-mixed effect models were used for the analysis and the same procedure as described for Experiment 3.1 and 3.2 was used to assess model fit. Again, emotional match/mismatch and character name (first or second) were included as fixed factors. In addition, the emotional state of the first character (emotional (divided into negative and positive)/neutral) was included as a new fixed factor. As in the previous experiments, participants and items were included as random intercepts and slopes. Contrasts were set with the neutral condition as baseline.

Part 2 contained either an emotional or non-emotional information mismatch. We found a main effect of match/mismatch with matching information being processed faster than mismatching information (match: $M = 2228$, $SD = 1355$; mismatch: $M = 2526$, $SD = 1436$). We did not find effects of the emotions portrayed by the first character (see Table 3.10).

Log Residual Reading Times		
<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts		

(Intercept)	0.00	-0.02 – 0.03	.862
Match	0.07	0.04 – 0.10	<.001
Positive	0.01	-0.03 – 0.04	.729
Negative	0.00	-0.03 – 0.04	.868
Match:Positive	0.01	-0.02 – 0.05	.500
Match:Negative	-0.00	-0.04 – 0.03	.856

Random Parts

σ^2	0.152
τ_{00} , Subject	0.000
τ_{00} , Exp	0.002

Table 3.10. LMM coefficients and effects for emotional match/mismatch and emotional state of first characters (negative, positive or neutral) on reading times, part 2, Experiment 3.3

Part 3 contained the name of either the first or second character and completed the text. Again, we found a main effect of information match/mismatch (see Table 3.11), as a spill-over effect from the previous part, with faster reading times for matching information (match: $M = 2880$, $SD = 2061$; mismatch: $M = 3056$, $SD = 1927$).

	Log Residual Reading Times		<i>p</i>
	<i>B</i>	<i>CI</i>	
Fixed Parts			
(Intercept)	0.00	-0.03 – 0.04	.853
Match	0.04	0.01 – 0.07	.003
Name	0.05	0.02 – 0.08	<.001
Positive	0.01	-0.03 – 0.06	.615
Negative	0.00	-0.04 – 0.05	.910
Match:Name	0.01	-0.02 – 0.03	.633
Match:Positive	0.01	-0.03 – 0.05	.600

Match:Negative	-0.02	-0.06 – 0.02	.345
Name:Positive	0.00	-0.04 – 0.04	.868
Name:Negative	0.01	-0.04 – 0.05	.787
Match:Name:Positive	0.05	0.01 – 0.09	.015
Match:Name:Negative	-0.04	-0.08 – -0.00	.035
Random Parts			
σ^2	0.226		
τ_{00} , Subject	0.000		
τ_{00} , Exp	0.005		

Table 3.11. LMM coefficients and effects for emotional match/mismatch, emotional state of first characters (negative, positive or neutral), and name of first or second character on reading times, part 3, Experiment 3.3

In addition, we found a main effect of character name (see Table 3.11). Participants read faster when the name of the first (more elaborate) character appeared in the last sentence of the text (first character: $M = 2853$, $SD = 2009$; second character: $M = 3084$, $SD = 1977$).

We did not find effects of the emotions of the first character (negative, positive or neutral). However, we found that interaction effects between the emotional match/mismatch and name of first or second character were qualified by the emotional of the first character (see Table 3.11). For texts describing a neutral character or a character with a positive emotion, participants preferred (i.e. read faster) information matches linked to the name of the first more elaborated character (see Figure 3.4).

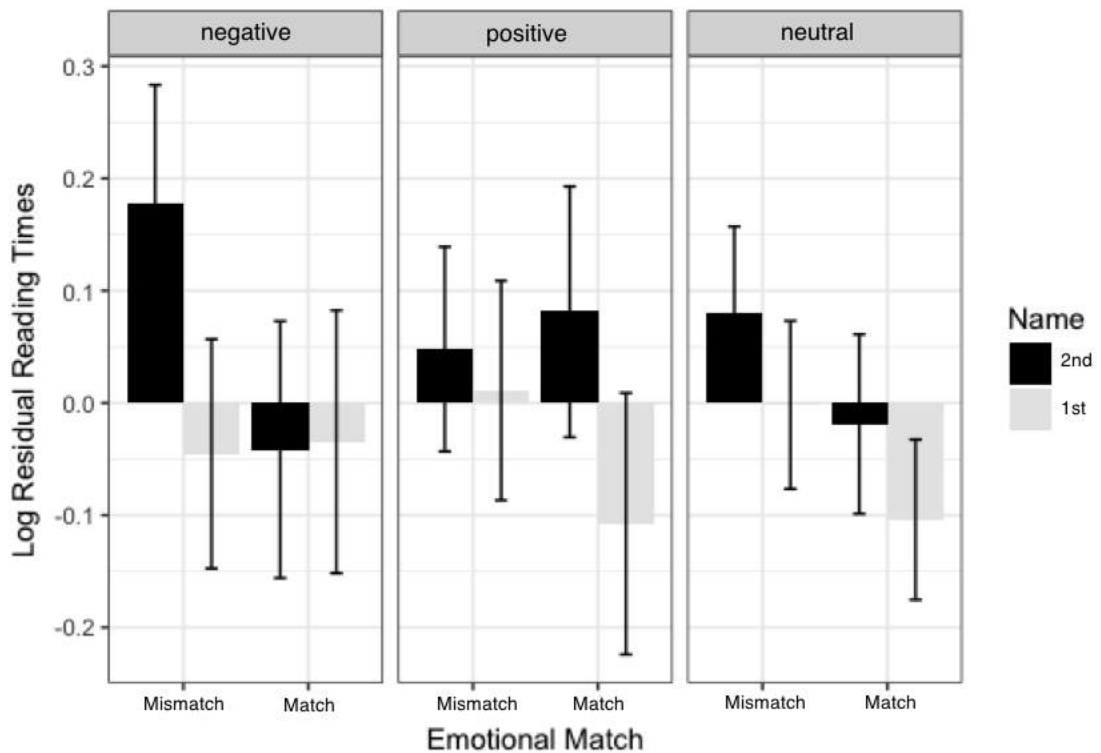


Figure 3.3. Reading times for emotional matches and character names (first more elaborated; second less elaborated); left for negative, mid for positive and right for neutral first characters, Experiment 3.3, (+1 SE)

All other continuations were read at a similar speed. However, for negative texts, participants read more slowly for continuations including an information mismatch and the name of the second less elaborated character (see Figure 3.4). Reading times were similar for conditions in which the emotion matched with the emotion of both characters and for the condition in which the emotion mismatched either character and the name of the more elaborated character was presented (see Figure 3.4).

3.6.2.2. Coherence Judgements

For the judgements after the information match/mismatch, we found a main effect of match/mismatch, with higher ratings for matching information (match: $M = 0.85$, $SD = 0.35$; mismatch: $M = 0.43$, $SD = 0.50$, see Table 3.12).

	Coherence Judgement		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.62	0.58 – 0.67	<.001
Match	-0.23	-0.26 – -0.19	<.001
Positive	-0.03	-0.07 – 0.02	.228
Neutral	-0.04	-0.08 – -0.00	.039
Match:Positive	0.01	-0.03 – 0.04	.757
Match:Neutral	-0.06	-0.09 – -0.02	<.001
Random Parts			
σ^2		0.152	
τ_{00} , Subject		0.013	
τ_{00} , Exp		0.004	
ρ_{01}		0.132	

Table 3.12. LMM coefficients and effects for emotional match/mismatch, emotional state of first character (negative/positive/neutral) on coherence judgments, part 2, Experiment 3.3

We also found an effect of whether the information about the character was emotional (positive/negative) or non-emotional (negative: $M = 0.59$, $SD = 0.49$, positive: $M = 0.58$, $SD = 0.49$, neutral: $M = 0.69$, $SD = 0.46$). Overall, continuations of texts containing a non-emotional neutral character were rated as more coherent. The interaction of emotional/non-emotional information and information match/mismatch was significant (see Table 3.12). For information matches, ratings were similarly high for neutral and emotional (neutral vs. negative: $t(119) = 1.10$, $p > 0.1$; and neutral vs. positive: $t(138) = 0.08$, $p > 0.1$) information. However, for information mismatches, participants rated continuations of neutral texts as more plausible ($M = 0.52$, $SD = 0.50$) as compared to continuations of emotional texts (neutral vs. negative: $M = 0.37$, $SD = 0.49$; $\beta = 0.14$, $t(120) = 3.23$, $SE = 0.04$, $p = 0.002$; neutral vs. positive: $M = 0.30$, $SD = 0.46$; $\beta = 0.22$, $t(137) = 5.11$, $SE = 0.04$, $p < 0.001$).

Also, for ratings after part 3, we found a main effect of character name (first: $M = 0.69$, $SD = 0.46$; second: $M = 0.56$, $SD = 0.5$), but not of emotional match/mismatch (see Table 3.13).

	Coherence Judgements		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.62	0.57 – 0.68	<.001
Match	-0.01	-0.05 – 0.02	.573
Name	-0.07	-0.10 – -0.04	<.001
Positive	-0.03	-0.07 – 0.02	.244
Neutral	0.00	-0.04 – 0.05	.857
Match:Name	0.08	0.05 – 0.11	<.001
Match:Positive	-0.00	-0.04 – 0.04	.901
Match:Neutral	-0.01	-0.05 – 0.03	.742
Name:Positive	-0.01	-0.05 – 0.04	.784
Name:Neutral	-0.00	-0.05 – 0.04	.911
Match:Name:Positive	0.03	-0.01 – 0.07	.154
Match:Name:Neutral	-0.02	-0.06 – 0.02	.351
Random Parts			
σ^2		0.194	
τ_{00} , Subject		0.015	
τ_{00} , Exp		0.009	

Table 3.13. LMM coefficients and effects for emotional match/mismatch, emotional state of first character (negative/positive/neutral), and character name (first/second) on coherence judgments, part 3, Experiment 3.3

The analysis revealed an interaction of information match/mismatch and of whether the name of the more elaborated character or the less elaborated character appeared in the final sentence (see Table 3.13). For information matches, participants

rated continuations containing the name of the more elaborated character higher ($M = 0.77$, $SD = 0.42$) than those containing the second, less elaborated, character ($M = 0.49$, $SD = 0.50$). However, for mismatching information, ratings were similar with regard to the name (first: $M = 0.61$, $SD = 0.49$, second: $M = 0.63$, $SD = 0.48$) that followed. Judgements were not affected by the first character's emotional status.

3.7. Discussion

Experiment 3.3 tested whether readers' mental representation of a more elaborated emotional character differed in saliency compared to elaborated neutral characters. We found that reading times were faster for texts that contained emotional information about characters, specifically when that information was of a negative type. For positive and neutral texts, readers were fastest at integrating matching information that was related to the first more elaborated character. This was not the case for negative texts. All continuations were read at a similar speed, except when the emotional information mismatched the overall context (i.e. when it was positive) and the name of the second previously neutral character was presented. For ratings, findings were similar to those from Experiments 3.1 and 3.2, with the addition that participants rated mismatching information as more plausible when the mismatch did not relate to the characters' emotions.

The results of Experiment 3.3 were similar to those of Experiments 3.1 and 3.2 for positive and neutral information. Therefore, positive emotional information did not affect the characters' saliency more than neutral information. However, we found a special role of negative information (as opposed to positive or neutral information) in reading comprehension. Readers were faster at processing negative emotional information about a character than at processing text about positive or neutral situations.

Our findings indicate that readers might be more engaged with negatively valenced texts either due to higher empathy responses and/or due to more frequent exposure to negative emotions in literary contexts (Altmann, Bohrn, Lubrich, Menninghaus, & Jacobs, 2012; Keen, 2006).

The findings with regard to information mismatch and match and the preference of the more elaborated character were mostly in line with our results of Experiment 3.1 (and also Experiment 3.2). Readers tried to link (positive emotional and neutral) information with the more elaborated character. Therefore, readings times were specifically fast when continuations contained matching information about the more elaborated (first) character. Information mismatches or information that was related to the second character caused longer processing times due to the inability to integrate new information with the more salient representation.

For negative texts, however, we found that matching and mismatching information was processed with similar speed when the new information referred to the more elaborated character. Readers might be more ‘ready’ for a positive emotional twist/change within the main character and partly anticipate a ‘happy ending’ of the text (Allbritton & Gerrig, 1991). However, we found that reading times were particularly slow for information mismatches that did not refer to the more elaborated but, rather, to the neutral character. It might be assumed that, when reading about negative events, readers have an even stronger preference towards information that is connected to the (negatively) emotional character. When the information (the valence) matches to the first character, it can be integrated very easily into the overall representation even if the name of the second character appears. Readers might either not be sensitive enough to the name, or they might try to make connections between the characters, as they share the same emotion. Only when there is no obvious link to the information that is evident in the more salient

representation (in terms of character name or emotional valence), readers are unable to make sense of new information or to integrate it in their mental representations. Hence our findings can be interpreted as an indicator that negative emotions in text make the character linked to these emotions more salient. This might be due to readers empathizing more strongly with characters experiencing a negative situation (Kidd & Castano, 2013; Altmann et al. 2012; Keen, 2006).

A possible explanation for the results in experiment 3.1 and 3.2 could be the order of characters. The saliency of the more elaborated character could potentially be a result of the more elaborated character appearing first in the text. However, experiment 3.3 did not only refute that the presented effects were driven by information load alone, but also that effects are not due to the character's first appearance in the text. If saliency effects were due to position or load alone, we would not expect effects of emotional status with regard to the first character. However, in experiment 3.3 we demonstrated, that there are processing differences between negative and positive/neutral characters (with negative characters being more salient) even when their position and information load is held constant.

Looking at the results of all studies, it appears that readers are able to infer a character's emotion even when only a small amount of information is given about them. More elaborated representations are kept in focus and are more salient. However, when new emotional information cannot be integrated with more qualified representations, readers are able to shift their focus towards emotionally less salient characters for which emotional information is inferred. These inferences can be drawn about characters with little emotional information, but less so from neutral characters. Readers were better at integrating any information that was broadly related to the more elaborated character and were less affected by emotional changes (mismatches in the text) as long as the

information was related to the more elaborated character. New information that was not related to that character led to processing problems. We suggest that readers are more engaged with negative situations and have an inner urge to gain more information about how the negative situation in the text is resolved. Hence, information that is not related to the negative situation of the character is more of challenge during processing than for neutral or positive information. Our experiments provide evidence that emotional information is an important factor that can influence readers' focus during text comprehension.

3.8. Conclusion

Our experiments used a match-mismatch paradigm to investigate whether readers have a preference to integrate emotional information with (emotionally) more elaborated characters. We found that emotionally charged representations of more elaborated characters remain in focus, leading to mismatch effects, regardless of the information given about a secondary character. Even when information matched the emotional status of the second character, but is inconsistent with the main, first character, mismatch effects were evident, showing that readers prioritize more elaborated emotional representations over representations with sparser information. When the emotion mismatched more elaborated representations, readers were able to match new information against the second representation, showing that emotional inferences are made about emotionally less qualified characters. Only when the more elaborated character was presented in a negative situation and new information could not be matched with that character's representation, did readers show difficulties in integrating new information with a second representation. We also investigated whether the provision of emotional information

causes the mental representation of a character to be more salient than the provision of neutral information.

Our studies gave evidence that readers focus on (emotionally) more elaborated characters and try to integrate new information with the representation of a character that already includes a similar type of information. We also found that readers are able to switch their focus when new information cannot be integrated with the more elaborated character. Our experiments also highlighted the special role of emotional information and found that especially negative emotional information causes representations to be more salient.

4. You're the emotional one: The Role of Perspective for Emotion Processing in Reading Comprehension

Scarlett Child,

Jane Oakhill &

Alan Garnham

University of Sussex

Reference

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4. 1. Abstract

Our experiments so far found evidence that emotional information plays a special role during processing and that emotional information leads to the saliency of a character representation. Chapter 4 presents two studies that examine whether this saliency is affected by whether readers engage with the text from a personal perspective. As we found differences between negatively and positively valenced texts, we also explore whether the engagement with emotions and perspective is affected by the valence of the text. Texts presenting characters in an emotional situation from either a personal or an onlooker perspective were presented and reading times were measured for each sentence. Participants also provided emotional self-ratings after reading. In the first experiment, positive texts were processed with greater ease, especially when readers experienced the texts from a personal perspective. In Experiment 4.2, an emotional match/mismatch was inserted so that a final explicit emotion word either matched or mismatched the emotional valence of the text. Mismatch effects were stronger and more consistent for the personal perspective. The two experiments provide evidence that the perspective of the reader can influence emotion processing. Processing of emotional information was easier for the personal perspective, and readers were more sensitive to inconsistent emotional information from that perspective.

Keywords: reading, comprehension, emotion, perspective, pronouns

4.2. Introduction

In the shop window you have promptly identified the cover with the title you were looking for. Following this visual trail, you have forced your way through the shop past the thick barricade of Books You Haven't Read, which were frowning at you from the tables and shelves, trying to cow you. (Calvino, 1981, p.10)

When reading a text, we are invited to imagine and to simulate an often fictional situation, and to experience this situation 'with our own eyes'. Some texts, such as the example by Calvino (1981) taken from *'If on A Winter's Night a Traveller'* make 'you' experience the story world from your own perspective, including the reader as an addressee and/or as the protagonist within the story. Research has examined some theoretical implications and definitions of the personal (second person) perspective (e.g. Fludernik, 1994; Schofield, 1998) and has been interested in whether there are effects on the reader's mental simulation of actions within text or other media. Our study furthers this research, as we investigate whether text processing and reading comprehension are affected by the use of the 'you' perspective. Especially for texts including a character that experiences emotional situations, we assume that the reader's engagement with the text can be intensified through use of this perspective. Therefore, the question is whether our perspective as the reader affects our emotional responses and how we process *'books frown at you'* as opposed to *'books frown at her'*.

The second person perspective *'is used to identify and directly or indirectly address a protagonist'* (Schofield, 1998, p.13) by the use of the personal pronoun 'you'. With *you* as the narrator, the author might intend to directly address the reader and/or to present them as the main protagonist. According to Schofield (1998) and McHale (1985), the involvement of the pronoun *you* *'is a sign of dialogue'* (McHale, 1985, p. 112) and it evokes a response in the reader such that readers are prompted to identify the relationship

between the addresser and the addressee within the text. It can also serve as a tool to assign a certain position to the reader within the text and to give instructions about how to interpret or feel about the text. Without more detailed information about the narrator or protagonist, the reader's only chance to make sense of the text's content is to 'put him/herself in the shoes of the protagonist' and to imagine the story world from her own perspective (Silverman, 1983). Therefore, the *you* perspective differs from the third person perspective (*he/she*) for instance, as it functions as an instruction to the reader to fill the position as the main character of the story (Schofield, 1998) and therefore, to simulate the actions in the text from their own viewpoint.

However, the degree to which the *you* perspective actually leads to the identification of the reader with the character is debated (Schofield, 1998; Phelan, 1994). Some literary theorists argue that even though readers are personally addressed by the *you* pronoun, they take a rather distant onlooker position to the situation in text, in particular as the characteristic profile of the narrator becomes more detailed (so the reader is less able to identify with it). In addition, as highlighted by Kacandes (1991; in Schofield, 1998), the second person perspective '*accomplishes [...] both a seduction to feel addressed and a realisation that the call is not quite accurate...*'. Even though the reader is addressed and invited to experience the situation in the text from their own personal perspective, there is a realisation that the situations and actions within the text are not actually (or very unlikely to be) performed by the reader him/herself. This conflict might be a unique and engaging characteristic of the second person perspective; however, it might also hinder the identification process of the reader with the protagonist. Moreover, it can be assumed that when situations about and characteristics of the character become more generic, readers might be more likely and more open to adopt the perspective of the *you*, i.e. the main character.

The special role of the personal perspective outlined in the literary context is also interesting for research investigating the mental processes that are involved during reading and text comprehension. For the current experiment, we assume that the perspective is an important element that influences how readers access the text, and that it affects the information that is stored in their mental representations of the text (Zwaan & Radvansky, 1998; Zwaan, 2004). For instance, we suggest that when readers are presented with a text including a character experiencing an emotional situation, their resulting mental representation will differ based on whether the emotion concerns *you* or *him/her*. This difference might be a result of the readers' position in relation to the text i.e. the degree to which they mentally simulate the situation described in the narrative.

Studies by Brunyé, Ditman, Mahoney, Augustyn and Taylor (2009) investigated how different pronouns in sentences (manipulating the perspective) change the way the reader engages with an action in the text. The authors found that the pronoun *you* caused readers to take an agent perspective ('*internal perspective*', Brunyé et al., 2009, p.31). Participants were asked to decide whether an action presented in a sentence (e.g. *I am/ You are/ He/She is slicing the tomato*, Brunyé et al., 2009, p.31) matched or mismatched an action displayed in a picture. Pictures were taken from an *internal* perspective (e.g. showing arms slicing a tomato as though one is looking down on them) or from an *external* perspective (e.g. showing someone else's arms, from a different angle, slicing a tomato). In addition, pictures either showed the action being performed (*performing*) or about to be performed (*nonperforming*) (Brunyé et al., 2009). Response times were found to be affected by the pronoun used in the sentence and by the perspective displayed in the picture. For the *I* and *you* sentences, response times were faster for the internal perspective pictures than for the external perspective, whereas for the *he/she* sentences this result was reversed. Brunyé et al. (2009) interpreted their results as showing that the *I* and *you*

perspective provoke an *internal* (more personal) perspective from which the reader simulates the action from an agent perspective. In a second similar experiment, two sentences were added to give more information about the actor. This time, readers preferred (reacted more quickly to) the external perspective when sentences contained the pronoun *I*. Results were similar (to the first experiment) for the *you* and *he/she* conditions. As argued by Brunyé et al. (2009), that additional information makes readers realise that *I* does not address them personally (i.e. that the text is experienced by an external main character). Therefore, it can be assumed that in order to take the perspective of narrator (i.e. to simulate the situation in text), readers need to be addressed directly and, as suggested by Silverman (1983), they need to be ‘instructed’ to assume the agent role with the pronoun *you*.

In more recent studies, Brunyé, Ditman, Mahoney and Taylor (2011) explored the role of the pronoun *you* for text comprehension in more detail with a study investigating recall of text. They found evidence that readers are better at recalling spatial information specifically, when they experience the text from a personal (*you*) perspective. Moreover, it was found that, when tracking and forming representations of the characters’ emotional states, readers were more likely to simulate a similar emotional state (as measured by self-ratings of emotions) when they accessed the text through the pronoun *you*. Similar to the notion of McHale (1985), suggesting that the *you*-perspective calls for a dialogue between the addressee (the reader) and the character, Brunyé et al. (2011) argue that the pronoun *you* promotes a sense of self-relevance in the reader, strengthening their ‘*interest and attention to described situations*’ (p.14). In addition, the authors highlight that the second person perspective invites readers to imagine themselves as agent, facilitating a simulation of the situation in the text. Due to a stronger simulation of the narrative in the *you* perspective, readers are prompted to vividly imagine spatial and emotional

information specifically (because of their importance for text comprehension) and therefore their recall accuracy and their perceptual skills (enabling them to mirror the emotions in text) are improved.

Research findings reported so far have highlighted the special role of the pronoun *you* for text comprehension and recall. Building up on the findings of Brunyé et al. (2009), Brunyé, Ditman, Giles, Holmes & Taylor (2016) extended the research on the use of pronouns for perspective manipulations and examined individual differences in self-reported text engagement. They found that the results reported in 2009 i.e. the perspective effects between different pronouns on reaction times, were moderated by readers' empathic engagement during comprehension. Readers who reported being more engaged with the text were more likely to be affected by the perspective manipulation (achieved by the use of pronouns). Again, the effects of perspective were measured through reaction times in decision tasks. Brunyé et al. (2016) therefore conclude that readers' engagement with texts predicts their sensitivity to perspective cues. In contrast, in our study it is explored how perspective affects readers' engagement with the text (rather than vice versa). Therefore, measures assessing comprehension processes *during* reading, rather than post-comprehension performance, will be of primary interest.

A recent study by Hartung, Hagoort and Willems (2017) assessed brain activation *during* reading. They found that readers' personal preference for a perspective affects their response to perspective as manipulated through pronouns. In their study, they compared brain activations during auditory text comprehension for texts in which the protagonist was referred to as either *I* or *he/she*. Similar to Brunyé et al. (2009), Hartung et al. (2017) found no clear comprehension differences (as monitored by brain activation) between first and third person perspectives. However, the authors report activation differences between readers who self-identified as *enactors* of the situation (*seeing*

through the eyes of the protagonist) and those who reported experiencing the situation as an observer (*as an eyewitness*) (Hartung et al., 2017). The results of Hartung et al. (2017) indicate again that the first-person perspective does not necessarily lead to a stronger and more personal engagement with the text, but that processing is affected by the degree to which readers are personally engaged with the text. For our study, we assume that the personal pronoun *you*, not studied by Hartung et al. (2017), functions as a more reliable tool for the reader to adopt the protagonist's perspective and, hence, to promote a stronger engagement with emotions experienced by the character in the text.

The main aim of our study is to show that a stronger mental simulation will not only affect the readers' responses or memory after reading (as shown by Brunyé et al., 2009), but also the reading process itself. In order to investigate the effects of perspective on comprehension processes *during* reading, our experiment will employ a self-paced reading design. Readers will be presented with texts that describe characters in emotional situations, as emotions in text are easily tracked and included in the mental representation. Also, texts including emotional information might lead to the relatively strong engagement of the reader (due to readers being more likely to empathise with the situation and sharing similar emotional experiences Dijkstra, Zwaan, Graesser & Magliano, 1995), which might then facilitate the perspective taking process. In our texts, situations first convey a certain emotion in an implicit manner (and do not state the emotion directly). We assume that, when readers take the agent perspective (through the pronoun *you*), they will simulate the situation more strongly than in the onlooker (*he/she*) perspective, and that they will, therefore, be better at simulating or adopting the emotion implied by the text. In the onlooker perspective, however, in addition to mental processes that help comprehension of the text, readers need to build up a new mental representation that includes information about another character. This process requires more complex mental

processes (Ruby & Decety, 2001) such as empathy (theory-of-mind) skills that help to make sense of the implicit emotional information, and to understand the actions of the (external) character. As these processes or skills are subservient to the reading process, when readers experience the text as the agent themselves (as they take the position of the character), reading times should be faster for the personal perspective (*you*) as compared to the onlooker perspective (*he/she*).

Previous research has emphasised that readers tend to show stronger empathic responses to negatively valenced scenarios (Kidd & Castano, 2013; Altmann, Bohrn, Lubrich, Menninghaus, & Jacobs, 2012; Keen, 2006,). This finding is also evident in Brunyé et al.'s (2011) study, which showed that affective responses (i.e. self-ratings of emotions) were particularly strong for the *you* perspective and negative texts. We will extend previous research by investigating whether valence effects are also evident *during* comprehension as reflected by reading times. For our study, we will present positive as well as negative texts to readers and compare perspective effects between the two emotional valences. We predict that readers prefer positive emotional information about *yourself*, and that they will therefore be faster at integrating information about positive situations. Also, we expect that stronger empathic responses to negative information will lead to faster reading times in both perspectives. Therefore, similar to Brunyé et al. (2011), we will also ask readers to rate their emotional response to the text in order to explore whether the patterns found for reading times are also evident in readers' affective responses.

Our study will comprise two experiments. In the first experiment, we will test whether reading is affected by the perspective texts are read from, and whether the texts' valence influences their engagement and their perspective taking. To our knowledge, research so far has investigated perspective effects on measures taken after processing,

our study will be the first to concentrate on perspective effects (in combination with valence) during processing. The aim is to investigate how readers map emotional information onto their mental representation (Rapp & van den Broek, 2005) and whether this process is affected by the perspective. In the second experiment, we extend the findings of the first by employing a match/mismatch paradigm, similar to that used in previous studies (e.g. Gernsbacher et al., 1992; Gygax et al., 2003). We do this to learn more about the strength of the mental representation that is build up during reading about *yourself* or *him/her*. We assume that a stronger simulation of the text through perspective taking (through the agent perspective) leads to stronger mental representations of even implicit emotional information encountered in the text.

In both experiments, the last sentence contains an explicit emotion word. In the first experiment this emotion word is always in line with the implicit emotion that is described in the text. In the second experiment, however, this emotional match is only evident for half of the trials. For the other half, the explicit emotion mismatches the overall context (or the implicit emotion). This emotional mismatch is predicted to result in longer reading times. Previous research has shown that readers can make context-based predictions on how sentences or texts might continue (Van Berkum, Brown, Zwitterlood, Kooijman & Hagoort, 2005; Traxler, Foss, Seely, Kaup & Morris, 2000), based on their situation models. For instance, Van Berkum et al. (2005) presented a reading time experiment, in which they measured reading times for sentence continuations i.e. specific words, that were either less predictable (low cloze probability) or highly predictable (high cloze probability) given the overall context. They found that reading times for low cloze probability continuations (less predictable words) were longer compared to continuations that were in line with reader's predictions. For our experiment (Experiment 4.2), we assume that readers can infer the emotional content of the text, and therefore are able to

predict text continuations containing an explicit emotion word that is in line with the emotional valence of the text (i.e. a negative word for a negative text). Continuations that are not in line with the emotional context (positive emotion words) should therefore lead to mismatch effects. If our prediction holds true, the mismatch effect should be particularly strong for the personal perspective including the pronoun *you*, due to stronger mental representations of the emotional valence that were build up during reading.

4.3. Experiment 4.1

4.3.1. Method

4.3.1.1. Participants

Thirty-six native speakers of English were recruited using the subject pool of the University of Sussex. Due to technical problems, the data of one participant could not be used for further analyses. Their age ranged from 18 - 33 years ($M = 22.31$, $SD = 3.27$). Participants were blind to the purpose of the study and did not have any reading disorders. The research was approved by the Sciences & Technology Cross-Schools Research Ethics Committee C-REC, University of Sussex.

4.3.1.2. Items

Twenty-four text passages were generated consisting of 5-9 sentences. In each passage characters experienced an event, giving the reader an impression of their feelings and emotions. The last sentence of each passage contained the explicit emotion word, which matched the implicit emotion of the associate character in the preceding text.

Twelve items described a character experiencing a positive situation, the other half described a negative situation in view of the character. There were two versions of each passage, one written in the second person singular (*you*) perspective (ex. 4.1a) and the other written in the third person (ex. 4.1b), containing a proper name and pronouns *he/she*

to refer to the character.

Example 4.1:

4.1a: ‘You’ perspective: *With a full bag in your hand, you make your way home. It feels quite heavy, but that does not really matter. You had assumed that you would have to spend so much more today. You had been trying to save up for a while, and this was a real bargain. You look at your bag with great satisfaction.*

4.1b: ‘He/She’ perspective: *With a full bag in his hand, Peter makes his way home. It feels quite heavy, but that does not really matter. He had assumed that he would have to spend so much more today. He had been trying to save up for a while, and this was a real bargain. He looks at his bag with great satisfaction.*

For the third person perspective, there were equal numbers of passages with female and male protagonists. After each item, participants were asked to rate their own emotional state (positive vs. negative) after reading the text. Ratings were given on a 10-point scale from *negative* (1) to *positive* (10).

4.3.1.3. Design

The main focus of the experiment was to investigate perspective effects on processing. In line with this aim, the first of the two factors included in the 2 x 2 design was perspective (onlooker *him/her* versus personal *you*). Second, we counterbalanced texts and compared perspective effects along emotional valence (*negative* versus *positive*). Two lists were created containing equal numbers of second and third person perspective items. Therefore, each participant read 12 items per condition, half of them presented a positive, and the other half a negative, emotion. Across the experiment, texts were counterbalanced by perspective, valence and gender of the character.

In addition to the experimental items, we included 24 additional distractor passages that included emotional information about characters. Distractors were texts of a similar length and written in third (*he/she*) or first (*I*) person perspectives in order to conceal the experimental manipulation. The distractor items were the same or similar to those in the studies reported by Gyga et al. (2003), with the personal pronouns changed from

third to first person and/or shortened. In contrast to the experimental items, the final sentence of the fillers did not contain an explicit emotion and the texts were therefore more ambiguous.

4.3.1.4. *Emotionality and Sensibility Ratings*

For emotionality, each list was rated by 5 different judges, all native speakers of English. Therefore, we obtained 5 ratings for each item, and each condition (perspective) separately. Ratings were given on a 5-point scale from 1 (*the text conveys a very negative emotion*) to 5 (*the text conveys a very positive emotion*).

Aggregated rating scores were analysed using t-tests. Emotionality ratings differed according to their valence: $t(46) = 19.8, p < 0.001$, with positive items being rated higher (more positive, $M = 3.98, SD = 0.32$) than negative items ($M = 2.15, SD = 0.32$). Ratings did not differ between perspectives (personal: $M = 3.17, SD = 0.92$; onlooker: $M = 2.97, SD = 1.05$). Cronbach's alpha for the 48 items scale was 0.94.

For sensibility, each list was rated by 5 judges (again all native speakers of English), so that five ratings were gained for each item in each condition. We tested whether sensibility was affected by valence, by perspective and also by an emotional match/mismatch manipulation in experiment 4.2. Ratings were given on a 5-point scale from -2 (*the text is not coherent/sensible*) to 2 (*the text is very coherent/sensible*).

Sensibility ratings were not affected by valence ($t = 1.33, p > 0.1$; negative: $M = 0.48, SD = 0.70$; positive: $M = 0.27, SD = 0.82$) or by perspective ($t = 1.12, p > 0.1$; personal: $M = 0.46, SD = 0.78$; onlooker: $M = 0.28, SD = 0.76$). Ratings were however affected by whether the emotion word in the final sentence matched the overall valence (see experiment 4.2): $t(94) = 16.76, p < .001$; Match: $M = 1.03, SD = 0.33$; Mismatch: $M = -0.29, SD = 0.44$. Hence, judges rated texts with emotion words that corresponded to

the overall emotion of the text as more coherent. For all 96 items (including all conditions, i.e. match/mismatch and personal/onlooker perspective) Cronbach's alpha was 0.96.

4.3.1.5. Procedure

The texts were presented using the computer software E-prime 2.0 (Schneider, Eschman & Zuccolotto, 2012) on a PC screen (Dell, 17 inches; white background with font size 24 and black font colour). They appeared in a different random order for each participant. Reading times for each sentence as well as final responses were recorded.

After an introduction and three practice trials, the main text passages were presented sentence by sentence. After having read the final sentence, participants typed in their self-rating i.e. the number rating their own emotion. After the response, the next trial began following a two second break.

4.3.2. Results

4.3.2.1. Reading times

We entered all the reading time data for each sentence in every experimental item and from all participants into the analysis. Before the analysis, 2.33% of the data, outliers 2.5 standard deviations below or above the mean reading times per sentence, were removed for each participant (means were calculated from remaining items).

The reading times were analysed using linear mixed effect models. A natural log transformation was performed in order to normalise the data. We accounted for length effects of different passages by regressing (log) reading times against the number of characters per sentence. These regressions were calculated by participant. As a result, log-residual reading times with a mean (intercept) of zero (per participant) were entered into the analyses.

The data were analysed using R (version 0.99.893; packages: lme4, Bates, Maechler,

Bolker & Walker, 2016, lmerTest, Kuznetsova, Brockhoff & Christensen, 2015, for linear mixed effect modelling with Satterthwaite approximations for the degrees of freedom and lsmeans, Lenth, 2016, for least-squares means contrasts). Perspective as well as valence were included as fixed-effects into the analysis using deviation coding. In addition, we also included participants and items with random intercepts⁵ and slopes into the mixed models. For parameter reports, we used the default restricted maximum likelihood estimations provided by the lme4 package. In order to decide the best model fit, the AIC (Akaike Information Criterion, Bates, 2010) was calculated (only for models meeting the convergence criteria). Also, following Bates (2015) we checked model fit via screeplots of Principal Component Analyses (PCA) of the related sets of random-effects (associated with participants and with items) with the help of the RePsychLing package (Baayen, Bates, Kliegl & Vasishth, 2015). We decided on, and report, models that met the convergence criterion, that generated lowest AIC scores, and did not show signs of overparameterization (and, hence, overfitting) in the PCA analysis (Bates, Kliegl, Vasishth & Baayen, 2015). For reading times, the final model included random intercepts of participants and items, but not random slopes (due to lowest AIC scores). Contrasts were set using sum contrasts.

The analysis revealed an effect of perspective on reading times (see Table 4.1).

⁵ Because of known, and unresolved, problems in the reporting of parameter estimates for lmer models with no random intercepts (see Walker, 2014; Bolker, 2013), we focused on models that included random intercepts. For the RT data estimates of the variability of the intercepts for participants were correct at 0.

	Residual Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Effects			
(Intercept)	-0.00	-0.02 – 0.02	.963
Perspective1	0.01	0.00 – 0.02	.019
Valence1	-0.01	-0.03 – 0.02	.547
Perspective1:Valence1	-0.02	-0.03 – -0.00	.005
Random Effects			
σ^2		0.132	
$\tau_{00, \text{Part}}$		0.000	
$\tau_{00, \text{Item}}$		0.002	

Table 4.1. LMM Coefficients and effects of perspective (you/he/she) and valence (negative/positive) on reading times, Experiment 4.1

Participants were slower when reading about another character (third person perspective: $M = 2282$, $SD = 1346$) than when reading a text about themselves (second person: $M = 2193$, $SD = 1277$). The analysis did not reveal a main effect of valence (see Table 4.1). Participants read negative and positive texts equally quickly (positive: $M = 2276$, $SD = 1320$; negative: $M = 2195$, $SD = 1303$).

An interaction of valence and perspective was found (see Table 4.1). For items describing negative emotions, there was no reading time difference ($t = 0.32$, $p > 0.1$) between second ($M = 2194$, $SD = 1270$) and third ($M = 2206$, $SD = 1336$) person perspectives. However, for positive emotions, reading times were faster for passages that were written from a personal perspective ($M = 2201$, $SD = 1284$) than from an onlooker perspective

($M = 2350$, $SD = 1351$; $t(4408) = 3.73$, $p < .001$; see Figure 4.1).

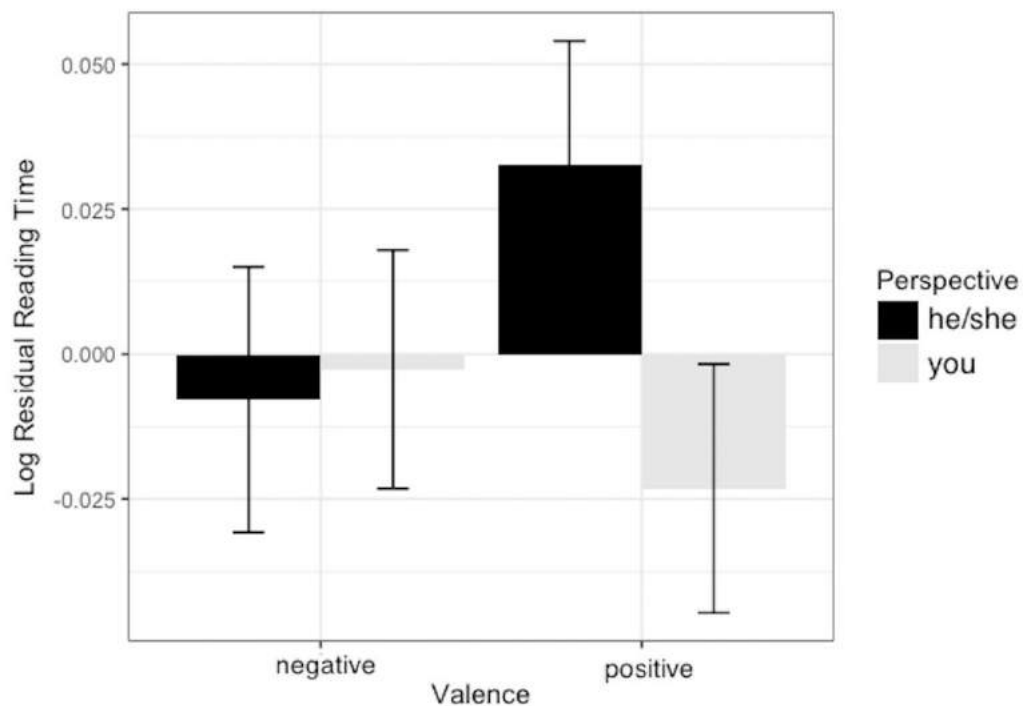


Figure 4.1. Reading times for different valences (negative/ positive) in each perspective, Experiment 4.1, (+1 SE)

Hence, perspective effects were found to be valence specific and only evident for positive texts.

4.3.2.2. Emotion ratings

Similar to reading times, perspective and valence were included as fixed factors for the analysis of emotional ratings. Random intercepts for participants and items were also included. The PCA (Baayen et al., 2015) indicated overparameterization in the maximum model (including random slopes for both effects and their interaction). Therefore, the model with random intercepts only is reported.

For the self-ratings of emotions, we found differences between negatively and positively valenced texts (see Table 4.2) with the readers' own emotional states being rated more positively for positive ($M = 6.93$, $SD = 1.75$) than negative texts ($M = 3.33$, $SD = 1.38$). Self-ratings were only marginally affected by perspective (see Table 4.2) with emotions

being rated as marginally more positive for the personal perspective ($M = 5.25$, $SD = 2.48$) than for the onlooker perspective ($M = 5.16$, $SD = 2.31$).

	Self-Ratings of Emotions		
	<i>B</i>	<i>CI</i>	<i>P</i>
Fixed Parts			
(Intercept)	5.11	4.85 – 5.38	<.001
Perspective1	-0.04	-0.08 – 0.00	.078
Valence1	-1.79	-1.97 – -1.60	<.001
Perspective1:Valence1	0.07	0.03 – 0.11	<.001
Random Parts			
σ^2		2.021	
$\tau_{00, \text{Part}}$		0.325	
$\tau_{00, \text{Item}}$		0.200	

Table 4.2. LMM Coefficients and effects of perspective (you/he\she) and valence (negative/positive) on self-ratings of emotions, Experiment 4.1

The analysis revealed an interaction between perspective and valence for self-reported emotions (see Table 4.2). Again, least-squares pairwise comparisons were used. Participants gave similar ratings for both perspectives when they were presented with a negative emotion ('he/she': $M = 3.36$, $SD = 1.29$; 'you': $M = 3.30$, $SD = 1.46$; $t = 1.08$, $p > 0.1$), but they gave higher ratings for the second person perspective *you* ($M = 7.04$, $SD = 1.77$) than for the third person perspective ($M = 6.82$, $SD = 1.73$) when reading about a positive emotion (perspective effect for positive emotion: ($t(4335) = 3.67$, $p < .001$, see

Figure 4.2).

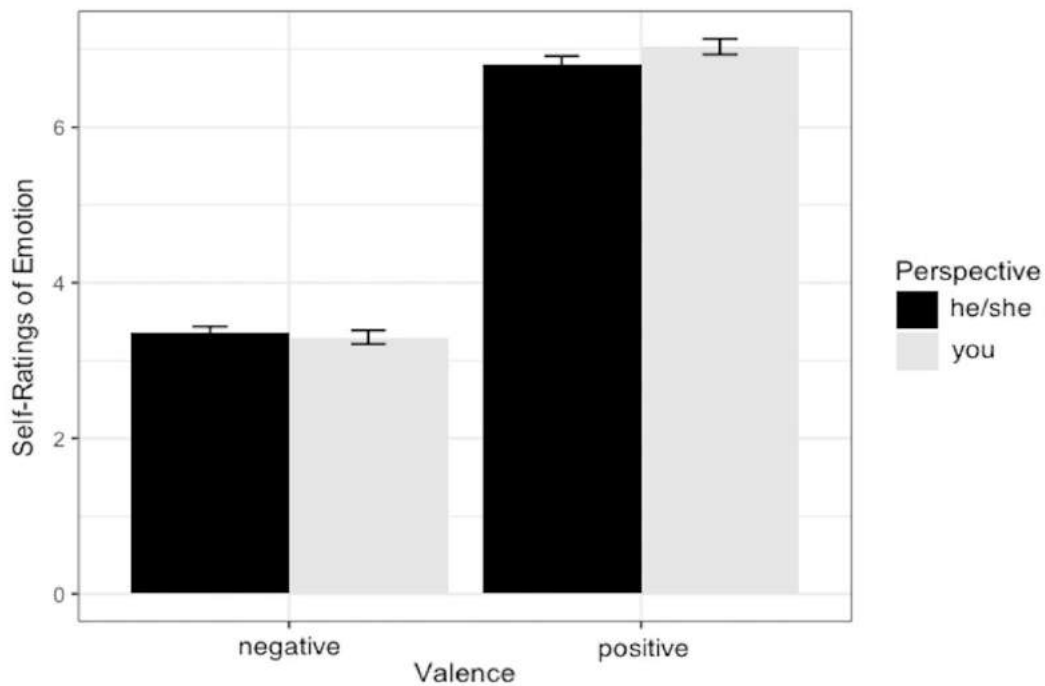


Figure 4.2. Self-Ratings of emotions for perspectives (personal/onlooker) and valences (negative/positive), Experiment 4.1, (± 1 SE)

Similar to reading times, perspective effects were only evident for texts including *positive* emotional information. Both sets of analyses of reading times and self-ratings showed evidence of an interaction between perspective and valence that indicate a stronger engagement with texts in the personal perspective particularly for positive texts.

4.3.3. Discussion

We investigated whether the perspective taken when reading a text influences comprehension, and in particular the processing of emotional information. Reading times were measured for text passages describing either a negative or positive emotion and presented from either the second person ‘you’ or third person ‘he/she’ perspective. Participants also rated their affective response from negative to positive on a scale from 1 – 10. They read faster overall when reading a text that was written from a personal

perspective (*you*) as compared to passages presenting another character (onlooker perspective). Also, emotional responses differed for the positive texts, in that participants rated their own feelings as more positive after reading a text presented in a personal perspective than one presented from the onlooker perspective.

These findings for positive (happy) items were in line with our predictions (see Ruby and Decety, 2001). The results demonstrate that readers are more engaged with positive events described in text when they experience them from their own viewpoint, i.e. when they take the agentive perspective.

In contrast to positive items, no perspective effect was found for negative texts. Reading times were similar regardless of perspective. This result was not predicted, but may be explained on the basis that readers effectively try to protect themselves from negative emotions, and are more resistant to imagining themselves as the agent of the situation. Therefore, they do not engage more with the text that is presented from a personal perspective as compared to a text that is presented from an onlooker perspective. Our reading time results are also reflected in the self-ratings of emotions. Similar to Brunyé et al. (2001) readers gave higher emotional ratings for the personal perspective, but only for positive items. Again, this shows that they simulate the situation and, therefore, experience the emotion more intensively when they are put in the perspective of the agent. However, we found that this is not the case for negative texts, which indicates that readers are reluctant to simulate negative situations (from the perspective of the agent) leading to negative affective responses.

This experiment showed that readers are influenced by the perspective they take during reading, but the picture is not yet complete. It seems that readers prefer positive emotional information when they experience a situation from the personal perspective. We further want to investigate whether a stronger engagement with the text, due to perspective (and

valence) also affects the strength of the mental representation that includes the implicit emotional information extracted from the text.

To test the effects of perspective on the salience of mental representations we conducted a second experiment. In addition to the manipulation of the perspective, we employed a match/mismatch paradigm, similar to that used in previous studies (e.g. Gernsbacher et al., 1992; Gygax et al., 2003). We used passages similar to those in Experiment 4.1, except that the explicit emotion at the end of the text either matched or mismatched the emotion implicit in the earlier part of the text. We predicted that readers would anticipate text continuations with emotion words that are in line with the emotional inference made from the text (Van Berkum et al., 2005) and slow down when they encountered an emotional mismatch regardless of perspective (Gernsbacher et al., 1992, Gygax et al., 2003). However, we also predicted that participants would react more strongly (with slower reading times) to emotional inconsistencies when they experienced the text from their own perspective. This would show that engagement with a situation in text that is described from a personal perspective is strengthened, and that the emotional information within the text becomes more salient.

4.4. Experiment 4.2

4.4.1. Method

4.4.1.1. Participants

Eighty participants were recruited at the University of Sussex, using the School of Psychology's subject pool. Participants' ages ranged from 18 – 46 years with $M = 20.58$ and $SD = 3.64$. None of the participants had taken part in Study 4.1 or were aware of the study's purpose. Participants who had any reading disorders or problems were

excluded from the study. The research was approved by the Sciences & Technology Cross-Schools Research Ethics Committee C-REC, University of Sussex.

4.4.1.2. Items

We used the same passages as in Experiment 4.1. In contrast to Experiment 4.1, this study included a match/mismatch condition with regard to the emotion word in the final sentence of the text. Therefore, half of the explicit emotion words (12 items) mentioned in the last sentence matched the context of the passage overall (ex. 4.2a, similar to Experiment 4.1). For the other half (12 items), the final explicit emotion mismatched the emotion implicitly described before. Mismatching emotion words (ex. 4.2b) represented an emotion opposite to that implied by the context.

Example 4.2:

4.2a: Match ('he/she'): *With a full bag in his hand, Peter makes his way home. It feels quite heavy, but that does not really matter. He had assumed that he would have to spend so much more today. He had been trying to save up for a while, and this was a real bargain. He looks at his bag with great **satisfaction**.*

4.2b: Mismatch ('you'): *With a full bag in your hand, you make your way home. It feels quite heavy, but that does not really matter. You had assumed that you would have to spend so much more today. You had been trying to save up for a while, and this was a real bargain. You look at your bag with great **discontentment**.*

4.4.1.3. Design

The study had a 2 x 2 x 2 design (perspective: *you/ he/she*; match/mismatch of emotion and valence: positive/negative). Following a Latin Square Design, four lists were created, with each item occurring in one condition and once per list. There were six items in each of the main experimental conditions in each list. Moreover, 24 filler items (the same as in Experiment 4.1, Gyax et al., 2003) were included to distract participants from the study's purpose. Filler items did not include a match/mismatch manipulation, but the final sentence was ambiguous.

4.4.1.4. Procedure

The procedure was the same as for Experiment 4.1. Items were presented sentence by sentence on a Dell monitor (17 inches) in black on white background with font size 24 using the E-Prime 2.0 software (Schneider, Eschman & Zuccolotto, 2012). Reading times were recorded for each sentence. After each passage, participants rated how the text made them feel on a scale from 1 – 10 (1 *negative*, 10 *positive*).

4.4.2. Results

4.4.2.1. Reading times

We analysed reading times for the last sentence, which included the explicit emotion and at which match and mismatch effects occurred. As in Experiment 4.1, we applied a natural-log transformation to reading times (due to a negative skew in the data), performed an outlier removal and calculated log residual reading times per character (including spaces) for each last sentence of the passage, and for each participant separately, using linear regression. Data points (logarithmic reading times for the last sentence) with a standard deviation of more than 2.5 from the mean per participant were removed, which led to the exclusion of 1.30% of the data. For the remaining data, we compared reading times per sentence for fixed factors including the perspective (personal or onlooker), emotional matches or mismatches between the explicit emotion and the main body of the text, and valence of the text (negative or positive) using deviation coding. The analysis with linear mixed effect models followed the same procedure as in Experiment 4.1 (using the REML default in lme4, Bates et al., 2016, and Satterthwaite approximations, lmerTest, Kuznetsova et al., 2015). Again, model fit was assessed by the AIC as well as by the PCA method suggested by Baayen et al. (2015), provided that models were not subject to convergence errors. Hence, the final model reported in this

analysis contained random intercepts for both participants and items.⁶ Pairwise comparisons are reported using the lsmeans package (Lenth, 2016).

We found an overall main effect of emotional (in-)consistency (see Table 4.3).

	Residual Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.00	-0.03 – 0.03	.977
Perspective1	0.01	-0.01 – 0.03	.355
Match1	0.12	0.11 – 0.14	<.001
Valence1	0.00	-0.02 – 0.02	.812
Perspective1:Match1	-0.01	-0.03 – 0.00	.103
Perspective1:Valence1	-0.00	-0.02 – 0.02	.978
Match1:Valence1	-0.00	-0.02 – 0.01	.656
Perspective1:Match1:Valence1	-0.02	-0.04 – -0.01	.008
Random Parts			
σ^2		0.107	
τ_{00} , Subject		0.000	
τ_{00} , Exp		0.005	

Table 4.3. LMM Coefficients and effects of match (match/mismatch), perspective (you/he\she) and valence (negative/positive) on reading times, Experiment 4.2

⁶ The majority of models including random slopes and interactions of slopes were subject to convergence issues or were overfitted (Baayen et al., 2015).

Reading times for the last sentence were longer when the emotion presented after the main text did not match the emotion implicit in the earlier part of the text (Mismatch: $M = 2524$, $SD = 1391$; Match: $M = 1857$, $SD = 837$). We did not find main effects of perspective or valence (Table 4.3). However, we found a three-way interaction of the fixed factors (Match/Mismatch, Perspective and Valence) that were included in the analysis (Table 4.3). Pairwise comparisons revealed that for negative texts, emotional match/mismatch effects were stronger in the personal perspective (*you*: $t(1865) = 12.71$, $p < 0.001$) than in the onlooker perspective (*he/she*: $t(1864) = 3.86$, $p < 0.001$). As can also be seen in Figure 4.3, this interaction was not evident for positive texts, for which match/mismatch effects were similar in both perspectives (*you*: $t(1867) = 5.62$, $p < 0.001$; *he/she*: $t(1867) = 10.96$, $p < 0.001$).

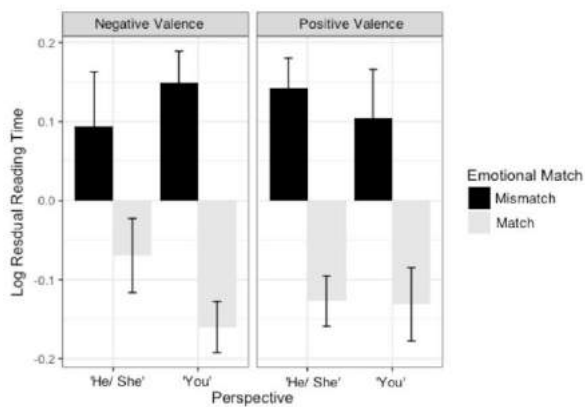


Figure 4.3. Reading times for match/mismatch, perspective and valence, Experiment 4.2, (+1 SE)

Hence, reading time differences between emotional matches and mismatches were found to be particularly strong when participant were presented with negative texts and engaged with the text from a personal perspective.

4.4.2.2. Emotional Responses

As with previous models, we used convergence, AIC and PCA criteria to assess best model fit. The final model included emotional match/mismatch, perspective and valence as fixed effects, random intercepts and slopes for perspective and

match/mismatch for participants and random intercepts and slopes for perspective for items.

	Self-Ratings of Emotions		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	5.15	4.53 – 5.78	<.001
Perspective1	-0.04	-0.20 – 0.11	.573
Match1	-0.18	-0.30 – -0.06	.004
Valence1	0.01	-0.15 – 0.18	.861
Perspective1:Match1	0.24	0.14 – 0.35	<.001
Perspective1:Valence1	0.09	-0.06 – 0.23	.244
Match1:Valence1	0.43	0.33 – 0.54	<.001
Perspective1:Match1:Valence1	0.04	-0.08 – 0.16	.532
Random Parts			
σ^2		4.096	
$\tau_{00, \text{Part}}$		0.158	
$\tau_{00, \text{Exp}}$		2.322	

Table 4.4. LMM Coefficients and effects of match (match/mismatch), perspective (you/he/she) and valence (negative/positive) on self-ratings of emotions, Experiment 4.2

For the self-ratings of emotions we found main effects of match ($M = 5.32$, $SD = 2.61$) vs. mismatch ($M = 4.91$, $SD = 2.65$) (see Table 4.4). Also, the interaction between the match/ mismatch variable and the valence was significant (see Table 4.4). With positively-valenced texts, participants reported feeling more positive when the emotion word matched the overall context of the text ($t(372) = 7.56$, $p = 0.001$; *emotion match*: $M = 6.29$, $SD = 2.38$; *emotion mismatch*: $M = 5.24$, $SD = 2.92$). Whereas for negative texts, they reported more positive feelings when the negative text was followed by a

positive emotion word ($t(372) = 3.07, p = 0.002$; *emotion match*: $M = 4.36, SD = 2.47$; *emotion mismatch*: $M = 4.59, SD = 2.29$).

We did not find a main effect in relation to perspective, but an interaction between perspective and match/mismatch was evident (see Table 4.4). This interaction rose because the differences between the ratings for emotional matches and mismatches were only evident in the personal perspective ($t(371) = 5.21, p < 0.001$) with more negative ratings for emotional mismatches ($M = 4.96, SD = 3.30$) and more positive ratings for emotional matches ($M = 5.47, SD = 2.74$). The effect of match/mismatch was not evident for the onlooker perspective ($t(391) = 0.72, p > 0.1$; *emotional mismatches*: $M = 4.87, SD = 1.76$; *emotional matches*: $M = 5.17, SD = 2.46$).

4.4.3. Discussion

Experiment 4.2 explored whether a reader's perspective influences the strength of their representation of a character's emotional state. We tested whether readers react more strongly to mismatching information when they experience the text from their own perspective than from an onlooker perspective. It was found that reading times for the last sentence were similar for both perspectives when the explicit emotion matched the emotional valence of the main text. However, findings revealed that when the final emotion word mismatched the previous context, reading times were slower for the personal perspective.

We found that, for both perspectives, participants built up a mental representation including information of an emotional nature. Match and mismatch effects demonstrated that participants were able to map consistent emotional information onto their mental representation of the text (Gygax et al. 2003; Rapp & van den Broek, 2005), and that new information that was not in line with readers' predictions leads to processing difficulties

(Van Berkum et al. 2005), regardless of whether they experience the text from a personal or onlooker viewpoint.

We predicted that mismatch effects would be evident for both perspectives, but that they would be stronger for the personal ‘*you*’ perspective. Our findings were mostly in line with our predictions. We found a perspective effect only when the emotional word was inconsistent with the emotion suggested in the text, with longer reading times for the personal perspective. We assume that when readers process texts that are presented from a personal perspective, they are better at simulating the situation described in the text and engage more with the affective state that is presented in the context. This deeper engagement leads to more detailed (stronger) mental representations of the implicit emotional information and therefore to stronger mismatch effects when new information does not match the context (Gygax et al., 2003).

With regard to reading times, this effect was, however, specific to texts describing a negative situation. Whereas mismatch effects for the third person perspective were less pronounced (they did not react very strongly to positive information following a negative text), readers seemed to have problems with the integration of positive information that mismatched a negative text when they took the agent perspective. There is a wealth of evidence that negative emotions in text lead to stronger empathic responses in the reader and that more empathic readers prefer negative stories (Kidd & Castano, 2013; Altmann et al., 2012; Keen, 2006). This valence effect, together with a generally stronger engagement caused by the personal perspective can explain our findings and the particularly strong inconsistency effects for negatively valenced texts. When readers image the stories from their own perspective, and imagine (simulate) their emotional responses to a negative situation, a sudden shift to a positive emotion leads to longer processing times because the final explicit emotion is not in line with the overall

emotional experience. However, in the third person perspective, where the text is about a different character, an emotional shift might be perceived as more likely (due to the unpredictability of the *other* character and the lower degree of emotional simulation).

In line with the reading time results, we found consistent mismatch effects when we asked readers for their self-assessed emotional ratings. Our findings provide evidence that readers simulate the emotion of the text more strongly when emotional information is consistent throughout the text (whether positive or negative) and when the text is presented from a personal perspective.

The results from in Experiment 4.2 are consistent with our predictions, and provide evidence that mental representations are stronger when readers access the text from a personal point of view. This finding is reflected in stronger inconsistency effects (when the emotion word mismatched the implicit emotion in text) for the second person ‘*you*’ perspective, though specifically for negatively valenced texts. The inconsistency effect (for negative items) was less pronounced for the third person perspective than for the personal perspective. We concluded that participants might be more open to emotional changes when they were not encouraged to identify closely with another character, therefore the emotional experiences of the (other) character are less predictable and readers have fewer difficulties in processing mismatching emotional information (especially from negative to positive). However, as representations are stronger for the personal perspective, emotional changes are more difficult to accommodate.

4.5. Conclusion

Our studies suggest that representations of emotional situations are influenced by the perspective taken during reading. Experiment 4.1 tested whether online processing is affected when readers read from a personal perspective. We found that positive events

are more readily processed when readers read from their own perspective. Negative events were read at a similar rate regardless of perspective, which indicates that readers are less likely to engage with negative events even from a personal perspective. Experiment 4.2 tested the strength and depth of mental representations built up from different perspectives by employing a match/ mismatch paradigm (Gygax et al., 2003). In the match condition readers were able to map an explicit emotion to the implicitly described emotion and its mental representation for both perspectives. However, in the mismatch condition, readers reacted more strongly to inconsistent information when they read from a personal perspective. This suggests that they internalised the emotional valence of the text more deeply when the pronoun '*you*' instead of '*he/she*' was used. The interaction between perspective and the match and mismatch condition was qualified by the valence of the text. Difficulties with integrating inconsistent information were particularly evident for the personal perspective when reading negative texts. Therefore, we suggest that the readers' engagement with the text is particularly strong when reading as though from their own perspective in a negative situation. We conclude that the personal perspective makes readers more sensitive to emotional inconsistencies and the emotional valence of a text, and therefore emotional changes are harder to process. Conversely, the onlooker perspective might cause readers to be more tolerant of mismatching information as emotions of another character are less predictable compared to one's own.

Our experiments showed that the perspective from which readers access a text influences not only offline (Brunyé et al., 2009, 2011) but also online measures. In the second person '*you*' perspective we found a greater ease of processing but a higher sensitivity to inconsistent emotional information. These findings are in line with and extend research investigating relationships and overlaps between readers' and characters'

emotions (Dijkstra et al., 1995). Future research might investigate whether readers who are more empathic by nature are more able to engage in perspective taking i.e. whether perspective effects are affected by an individual's ability to understand characters' emotions more generally. Hartung et al. (2017) suggested that perspective taking during comprehension is not necessarily linked to the pronouns used in the text, but to the readers' preference to adopt an enactor's or observer's point of view. Also, Brunyé et al. (2016) found evidence of individual differences in response to different pronouns on reading comprehension. Future studies might therefore explore a reader's predisposition or ability to take a certain perspective during reading and explore whether these tendencies affect the engagement with text in relation to the pronoun *you*. For example, readers could be asked to respond to some trait measures that assess their abilities to engage with text and understand other's emotions (e.g. theory of mind skills, e.g. Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) and their ability to mirror emotions in text (affective empathy, e.g. Johnson, 2012). It would be interesting to explore whether these trait measures are related to readers' sensitivity to perspective cues in text.

Also, given the differences between emotional match and mismatch in the different perspectives, it would be interesting to explore the ease with which readers accommodate emotional changes within the character, and whether it depends on the direction of the change (as defined by valence). Moreover, we explored the relationship between readers' and characters' emotions in just one direction (character to reader). It would also be interesting to assess whether readers' emotions influence their interpretation of emotional situations described in a text.

5. Are you moodier than her? – The Effects of Mood on Reading and Engagement with Perspective

Scarlett Child,

Jane Oakhill &

Alan Garnham

University of Sussex

Reference:

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5.1. Abstract

In the previous chapters, we investigated how emotions in text affect processing and also how the perspective affects how readers engage with the emotions in text. This chapter. In this chapter we account for the fact that not only characters but also readers experience emotions and that readers' emotions might impact the way emotions in text are processed. As we explained in previous chapters, readers form mental representations of characters' emotions in text, and are able to perceive emotional incongruencies when new information is processed. The current study examines whether emotional representations and the preference for consistent emotional information is affected by the readers' own emotions and the perspective they take during processing. Texts presenting characters in negative and positive situations were presented from an onlooker perspective including the pronouns he or she, or from a personal perspective, including the pronoun you. Additionally, before the reading task, participants were induced with a positive or a negative mood using film clips. Reading times and ratings of emotions for emotionally inconsistent or consistent text continuations were measured to assess whether comprehension processes were affected by congruency between the emotional state of readers and characters or by mood biases. Results indicate that comprehension processes were affected by participants' mood. In particular, participants in a positive mood revealed a preference towards positive information, even when this information was inconsistent with the previous text. In addition, participants in a positive mood were found to be more sensitive to perspective cues and engaged more strongly with text written from a personal perspective.

Keywords: reading, inconsistency, emotion, mood, perspective

5.2. Introduction

Imagine the following situation:

You have had a very productive day at work and got very good feedback about your work. When you are home, you try to settle down over a good book. The character in the book, Bridget, has had a similarly successful and motivating day and she feels thrilled. You can understand this feeling very well right now.

Interesting challenges arise when we attempt to understand how readers comprehend and engage with the story worlds presented in text. Traditionally, researchers have focused on how readers comprehend and process emotional information and how this emotional information is used to construct a mental representation of the story world (de Vega, León & Díaz, 1996; Gernsbacher, Goldsmith & Robertson, 1992; Gyga, Garnham & Oakhill, 2003). Emotions in text are an essential part of text comprehension as they help the reader to form a coherent representation of the text (as they are highly related to the characters' motivations and give explanations for their behaviour and actions, e.g. Zwaan, 1999b). However, only few studies have considered that the comprehension and the processing of emotional information in text might be influenced by how able readers are to engage and identify with the characters' emotions, especially when the emotions portrayed in the text are not congruent to the readers' own emotions (mood). It is important to remember that readers are people, who are emotional beings independent of the emotional information they receive in a text; so the interaction between these (potentially conflicting) emotional entities becomes important. Previous studies have explored how the mood of the reader can be affected by the emotional state of a character in text, potentially mirroring that emotional state (Oatley, 1995; Dijkstra, Zwaan, Graesser & Magliano, 1995). In the present study, we focus on the other side of

this process, asking how the pre-existing emotional state of the reader (mood) affects their engagement with emotional character information in text. We investigate, for example, whether *you* would process the emotional information about *Bridget's* work day in a similar way if *you* came home in a bad (rather than a good) mood.

Our study also aims to explore whether the potential conflict between the reader's mood and a character's emotions is more pronounced when the reader experiences the text from a personal perspective. Previous research has concluded that, by manipulating personal pronouns such as *you* and *he/she* within a text passage, readers can experience the text from different perspectives (Brunyé, Ditman, Mahoney, Augustyn & Taylor, 2009). For instance, if addressed as *you*, the reader is assigned to be the experiencer and assumes the mental role of the protagonist within the text (Schofield, 1998, Kancandes, 1993) which leads to a greater identification and engagement with the situation. By reporting the situation from another character's perspective, using the pronouns *he* and *she*, readers experience the text from an onlooker perspective, through the eyes of someone else. Brunyé et al. (2009) found that, because of a stronger engagement with the sentences they presented in the *you* perspective, readers were faster and more accurate in a subsequent decision task - verifying that an action displayed in a picture corresponded to the action described by the sentence. We therefore assume that a deeper engagement with the text from a personal perspective will result in more easily accessible mental representations.

When predicting the likely effects of pre-existing mood states on character emotional information in text, we assume that readers' engagement might be dependent on three different mood-related factors. The first factor is mood congruency (whether the emotional states of readers and characters are congruent or not). A number of researchers have argued that congruence between a reader's mood state and the text helps

comprehension processes (Egidi & Nusbaum, 2012; Bohn-Gettler & Rapp, 2011; Niedenthal, 2007; Bower, 1981). For instance, ERP studies by Egidi and Nusbaum (2012) showed that processing is moderated by the congruency of the reader's mood (negative or positive) and the emotions in text (also negative or positive). In their study, higher amplitudes of the N400 (a component associated with semantic processing) were interpreted as indicators of more difficult processing (more difficult semantic integration). Higher amplitudes of the N400 components were found when the reader's induced mood (e.g. *happy*) did not conform with the valence of the text (e.g. *negative*). Niedenthal (2007) explored a similar relationship, between the emotional states of readers and the emotions displayed in text, by prompting participants to smile (or to suppress smiling) whilst reading positively (or negatively) valenced sentences. The results showed a relation between the behavioural enactment of emotions (smile/ non-smile) and cognitive processing, and they give evidence that there are processing benefits when the emotional valence of the text matches the reader's mood. Therefore, in the present study, we assume that engagement with the emotional content in text and the engagement with perspective are facilitated and strengthened when the mood of the participants matches the valence of the character's emotions.

The second mood-related factor that has been found to affect processing is mood bias: where readers favour certain types (valences) of information above others. Diener and Diener (1996) reported that individuals have a natural bias towards a slightly positive mood state. Furthermore, Herbert, Junghofer and Kissler (2008) showed that this mood bias is also a factor that dictates what information is particularly attended to during reading - positive information is processed with greater ease than negative information. This finding suggests that text describing a positive situation should be read with greater ease (i.e. faster) than text describing a negative situation. Therefore, in order to stabilize

their emotional state and revert to a more positive mood, individuals in a negative mood state should be inclined to focus on positive information. Similarly, for individuals in a positive mood, positive information signifies a reinforcement rather than a threat to the positive mood state and therefore positive information is likely to be processed with greater ease.

A third factor that might affect readers' engagement with the emotions in text is based on the notion that readers use different processing strategies as a function of mood (Bohn-Gettler & Rapp, 2012; Forgas & Eich, 2012; Erber & Erber, 2001). For instance, studies by Bohn-Gettler and Rapp (2011) have shown that readers in a positively induced mood attend more to text-relevant information (making more text-relevant inferences) whereas participants in a negative mood divided their attention between text-relevant and text-irrelevant information (with fewer text-relevant inferences). This finding indicates that readers in a positive mood engage more with vital information in the text and that they might therefore be more sensitive to perspective changes and cues.

Also, and in line with the notion of a mood bias, it was found that individuals in a negative mood state scrutinise new information in more detail and make use of more effortful strategic processing in order to 'repair' their negative mood state whereas individuals in positive emotional states avoid in-depth processing of new information and engage in shallow processing to minimise the risk of an emotional change (Erber & Erber, 2001). Following this account, the sensitivity for inconsistent information is likely to be increased for individuals with a negative emotional state. Also, due to a more strategic processing strategy, negative emotions might lead to a more extensive relevance of personal goals and hence, perspective and inconsistency effects are likely to be stronger compared to individuals in a positive emotional state.

In order to measure how strongly readers in different mood states engage with the emotions in text and as a function of perspective, we will present texts with emotional matches and mismatches (Gygax et al., 2003, Gernsbacher et al., 1992). In their studies, which explored whether readers incorporate emotional information into their mental representations of the text, Gygax et al. (2003) and Gernsbacher et al. (1992) presented texts including implicit emotional information about a character. In the final sentence, texts included an explicit emotion word that either matched or mismatched the implicit emotion of the character. Both studies found that readers include emotional information (the emotional valence) in their mental representations, as readers needed longer to process emotional mismatches compared to emotional matches.

We examine whether the degree to which readers personally engage with emotional texts and the degree to which readers take the perspective of the characters differ when their mood is either congruent or incongruent with the emotion of the texts. We will induce mood states in readers with the help of film clips (e.g. Rottenberg, Ray & Gross, 2007) and we will present texts describing emotionally negative and positive situations from different perspectives, including an emotional match/mismatch element.

We predict that, with greater engagement in the *you* perspective⁷, match and mismatch effects will be stronger, due to more salient mental representations, and that match/mismatch effects (i.e. text engagement and engagement with perspective) will be affected by the readers' mood. For instance, it can be suggested that in line with our first point, the congruency between the readers' mood and the valence of the text causes a stronger identification of readers that are induced with a positive mood with texts that display a positive situation (similarly, with negative situations for negative moods; Egidi

⁷ Engagement here is how involved the reader is in the situation. We assume that greater engagement leads to faster reading due to greater interest in the text continuation/ greater suspense, but also that reading with greater engagement can lead to more elaborate and salient representations (see also Miller, 2015).

& Nusbaum, 2012; Niedenthal, 2007; Bower, 1981). Following the notion of different reading strategies as a function of mood (Bohn-Gettler & Rapp, 2011) a positive mood might lead to stronger engagement with perspective and, hence, to stronger match/mismatch effects in the *you* perspective indicating that a positive mood makes readers more sensitive to perspective cues. In line with our third factor, regarding mood biases, (Herbert et al., 2008; Diener & Diener, 1996) positive texts might lead to a stronger engagement with the situation, especially in the personal perspective in which readers are *invited* to identify with the character (Schofield, 1998).

5.3. Method

5.3.1. Participants

Forty participants were recruited at the University of Sussex, using the Sona participant recruitment pool of the university. Participants were students or staff members and received course credit or payment for their participation. Their age ranged from 18-33 years with $M = 21.42$ and $SD = 4.02$ (positive mood group: $M = 21.44$, $SD = 3.4$; negative mood group: $M = 21.53$, $SD = 4.69$).

5.3.2. Reading Task Items

Twenty-four text passages were generated. There were two versions of each passage, one presented from an internal perspective using the pronoun *you* (see example 5.1a) and one presented from an onlooker perspective introducing a fictional character by name once and using the pronouns *he* or *she* in the remainder of the passage (see example 5.1b).

Example 5.1

a. *You: Main text:*

With a full bag in your hand, you make your way home. It feels quite heavy, but that does not really matter. You had assumed that you would have to spend so much more today. You had been trying to save up for a while, and got some real bargains.

*Last sentence: You look at your bag with great **satisfaction/discontentment**.*

b. *He/She: Main text:*

With a full bag in his hand, Peter makes his way home. It feels quite heavy, but that does not really matter. He had assumed that he would have to spend so much more today. He had been trying to save up for a while, and got some real bargains.

*Last sentence: He looks at his bag with great **satisfaction/discontentment**.*

The length of the passages ranged from five to nine sentences. The passages described a situation in which the character (*you* or *he/she*) experienced either a positive or a negative emotion. The valence of the emotion in the texts and the gender of the main character for the onlooker perspective were counterbalanced over experimental items. The final sentence of each text included an explicit emotion word that either matched or mismatched the emotion and, hence, the valence of the main part of the text (see example 5.1, satisfaction for match, discontentment for mismatch). For the analyses, we first analysed the whole text to see whether perspective and mood affect processing overall and in a second analysis we focused on the last sentence only (see example 5.1) to find whether the emotional state of the reader affects their sensitivity to emotionally inconsistent information. Twenty-four distractor items, taken from Gygas et al. (2003), were added to mask the purpose of the experiment. The distractors also described a single character, either in the onlooker perspective ('he/she') or in the first person narrative perspective (using the pronoun 'I'). All distractors were of similar length and style to the experimental items, however, they did not describe a particularly emotional situation (but for example the character's surroundings whilst waiting at the airport). Distractors did not include information mismatches.

5.3.3. Design

The experiment was conducted using a mixed-design including four independent variables, each with two levels. First, as a between-subject and within-item factor, we divided participants into two groups, presented with either negative or positive film clips to induce sad or happy mood states. Second, all participants were presented with texts written in the second person singular *you* (internal) and the third person singular *he/she* (onlooker) perspectives (hence *perspective* was a within-subject/within-item factor). Third, text passages included an emotion word that either matched or mismatched the emotional valence of the passage. Similar to perspective, match/mismatch was a within-subject and within-item factor in this experiment. Fourth, we included the valence of the text as another factor. Texts presented a character experiencing a positive or a negative emotion (valence was a within-subject but between item factor). Emotional states were described implicitly in the main text, and an emotion word in the final sentence either matched or mismatched the emotion outlined in the text. Therefore, we created four different versions of the same text, each text in both perspectives, and with an emotional match or mismatch in the final sentence. For items and participants, reading times for the perspectives and for emotional matches and mismatches were analysed using within-subject/within-item comparisons.

Following a Latin Square Design, four lists including the 24 experimental items, each in only one condition, and with the same number of items per condition, were created. Each participant was presented with only one list of items. Each list was presented to the same number of participants in each mood condition. Items were presented in a pseudo-randomised order that was different for each participant.

5.3.4. Mood Induction

Participants were randomly assigned to the positive (happy) or negative (sad) mood group. A recommended method for stimulating negative or positive mood states within the same study is the induction via film clips (Isen & Gorgoglione, 1983; Westermann, Spies, Stahl & Hesse, 1996). As shown later by Rottenberg et al. (2007) and Van Berkum, De Goede, Van Alphen, Mulder, & Kerstholt, (2013) mood changes can be reliably caused by either negative or positive film clips and the resulting mood states are shown to be durable. Similar to previous studies using mood induction techniques (Vissers, Virgillito, Fitzgerald, Speckens, Tendolkar, van Oostrom & Chwilla, 2010; Fitzgerald, Arnold, Becker, Rinck, Rijpkema, Fernandez & Tendolkar; 2011; Van Berkum et al. 2013) we chose film sequences from *Happy Feet* for the positive induction and from *Sophie's Choice* for the negative induction. The film clips lasted 6.56 minutes for the positive induction and 6.37 minutes for the negative induction. Participants were asked to give ratings of their own emotional mood state at the beginning of the session. A list of emotional states including positive (*cheerful, content, good-humoured, positive, good*) and negative items (*negative sad, gloomy, down, bad*) was used. The main emotional states were mixed with 15 other states as distractor items (e.g. *curious* and *irritated*). Participants completed a paper questionnaire, to provide ratings for each item, indicating how well the emotion described their current personal mood on a 7-point scale (1 meaning *the emotion does not apply at all*, 7 that they *feel the emotion very strongly*). During the experiment, participants were asked to rate their mood two more times using the same list of 25 emotional states. After the first mood report (the baseline mood state), the first film clip (mood induction sequence) was presented. Participants then estimated their mood again. After participants had read half of the experimental items, a second clip (3.58 minutes of *Happy Feet* for the positive group and 4.00 minutes of *Sophie's Choice*

for the negative group) was presented. A third mood rating was collected after the experiment in order to ensure that the induction effects were robust.

5.3.5. Reading Task Procedure

Using the software Eprime2 (Schneider, Eschman & Zuccolotto, 2007), items were presented on a Dell 15-inch screen (black font on white background, 18-point font in Courier New). Passages were presented sentence by sentence in a self-paced reading paradigm. Participants gave responses via the keyboard (space bar to proceed in the text). After each text passage, they were asked to rate how the text made them feel. Ratings were given on a 10-point scale (1 *very negative*, 10 *very positive*) and again entered on the keyboard. Note that these ratings were separate from the overall mood ratings described above. After giving their rating, there was a two second break before participants proceeded with the next item. In order to familiarise the participants with the task, three practice trials were presented before the start of the main experiment.

5.3.6. Film Ratings

The film rating procedure was based on the procedure used by van Berkum et al. (2013). Film ratings were used to check whether the chosen films clearly differed in their emotional content (i.e. whether *Happy Feet* is associated with more positive emotions than *Sophie's choice*). At the end of the experiment, participants were asked to rate the film clips. As for the mood ratings, a pen and paper questionnaire was used, including two positive adjectives (*cheerful, funny*), and two negative adjectives (*sad, moving*). In addition, six adjectives with more ambiguous valences were added to the questionnaire (*beautiful, interesting, exciting, intense, complicated, boring*). Participants provided ratings on a 7-point scale from 1 (*the adjective does not apply to the film*) to 7 (*the*

adjective describes the film very well). Again, the scales for negative and positive items were merged and transformed to a single 7-point scale from -3 (*negative film associations*) to 3 (*positive film associations*).

5.4. Results

5.4.1. Mood Induction

In order to measure and compare negative emotions and positive emotions using a single scale, we transformed and centred our 7-point scale with a range from 1 (no experience of this particular emotional state) to 7 (strong experience of this emotional state) to a scale ranging from -3 (negative emotional experience) to 3 (positive emotional experience) with a centre of 0 (previous rating of 4, neutral emotion). For example, ratings indicating experiences of a negative emotional state (rated with scores from 5 to 7) were transformed to their corresponding negative scores (-1 to -3). In turn, ratings indicating positive emotional experiences (i.e. ratings for positive emotional states ranging from 5 to 7) were transformed to positive scores ranging from 1 to 3 (van Berkum et al., 2013). Table 5.1 shows average ratings for each group for the three rating stages (before the experiment, after the induction, after the experiment).

	Happy Feet		Sophie's Choice	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Base (prior)	1.78	0.81	1.66	0.87
After 1 st clip ***	2.25	0.57	0.37	1.25
Final ***	2.02	0.76	0.79	1.32

Signif. codes: 0 '***' 0.001 '**' 0.01 '*'

Table 5.1. Mean mood ratings per group, negative (-3) – positive (3), (Happy Feet for positive group, Sophie's Choice for negative group)

First, we found that mood ratings were influenced by the mood induction i.e. by the film presented to participants: $F(1,114) = 37.26, p < 0.001$. Participants induced with a happy mood rated their own mood state as more positive (see table 5.1) than participants induced with a negative mood.

A 2 x 3 mixed-ANOVA (induced mood, positive or negative and time of rating, before the induction, after the first film clip, after the experiment), was conducted to explore whether the effect triggered by the mood induction changed over time. The ANOVA revealed an interaction between time and film group: $F(2, 114) = 8.41, p = 0.003$. We found that baseline ratings were similar for both groups ($\beta = 0.13, t(114) = 0.4, SE = 0.31, p = 0.683$; which means that mood ratings did not differ before the induction). Mood ratings differed for the ratings taken after the first film-induction ($\beta = 1.88, t(114) = 6.15, SE = 0.31, p < 0.001$). Ratings were more negative for individuals induced with a negative mood (see table 5.1). Participants induced with a positive mood did not improve their baseline mood state (base/after 1st clip: $\beta = 0.46, t(114) = 1.50, SE = 0.31, p = 0.14$; base/final: $\beta = 0.23, t(114) = 0.75, SE = 0.31, p = 0.45$) however the emotional state of participants watching a negative film clip deteriorated compared to baseline (base/after 1st clip: $\beta = 1.3, t(114) = 4.23, SE = 0.31, p < 0.001$; base/final: $\beta = 0.88, t(114) = 2.86, SE = 0.31, p = 0.005$). This results was similar for ratings taken after the experiment ($\beta = 1.23, t(114) = 4.02, SE = 0.31, p < 0.001$). The mood induction was successful, especially considering the negative induction, as participants watching the negative film rated their own emotions more negatively for ratings taken after the induction.

5.4.2. Film Ratings

Film ratings were influenced by the valance of the clips, ($t(38) = 17, p < 0.001$). *Happy Feet* ($M = 1.14, SD = 0.87$) received higher (more positive) ratings than *Sophie's Choice* ($M = 2.61, SD = 0.46$). Average clip ratings for each individual adjective per film can be seen in Table 5.2.

	Happy Feet		Sophie's choice	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Cheerful ***	1.8	1.6	-2.9	0.3
Funny ***	1.25	1.74	-2.95	0.22
beautiful ***	0.65	1.63	-1.8	1.47
interesting ***	0.6	1.64	5.5	1.19
exciting **	1.95	1.79	2.95	1.99
sad ***	1.7	1.3	-2.45	1.15
moving ***	-0.2	1.79	-2.15	0.93
intense ***	1.1	1.74	-1.95	1.43
complicated **	1.85	1.59	0	1.84
boring	2	1.48	2.45	1.05
Signif. codes: 0 '***' 0.001 '**' 0.01 '*'				

Table 5.2. Mean film ratings for mood induction films (negative (-3) – positive (3))

5.4.3. Reading Times

First, to counteract a positive skew, we normalized the data using a log-transformation. We then excluded outliers more than 2.5 standard deviations from the mean reading time per sentence for each participant. For the whole data set, including all sentences, we removed 1.44% of the data. For the analysis including the last sentence only, we removed 1.35% of the data. The remaining data, i.e. reading times for each participant for each sentence across all items were transformed into logarithmic residual reading times. For each participant, we calculated residual log reading times by regressing

log reading times against sentence length (measured in characters including spaces). Thus, logarithmic residual reading times were used in the analysis. We report the corresponding means and standard deviations from raw scores (in milliseconds). The reading time data were analysed using linear mixed effect modelling in R (R Studio Team, 2015; with the lme4 package, Bates, Maechler, Bolker & Walker, 2015) using the default REML estimation. In addition, we used the Satterwaithe approximation for degrees of freedom (lmerTest package, Kuznetsova, Brockhoff & Christensen, 2015) to provide probability values. Contrasts were coded using sum contrasts. Mixed-effect models included mood, perspective, valence and match/mismatch as fixed factors, and participants and items as random effects (for intercepts and slopes)⁸. For each analysis, model fits were assessed and compared via convergence criteria, the AIC (Akaike Information Criterion, Bates, 2010) and Principle Component Analysis (PCA) provided by the RePsychLing package (Baayen, Bates, Kliegl & Vasishth, 2015). The models reported for the analysis met the convergence criteria, had the lowest AIC and were not subject to overfitting as demonstrated by the PCA (Bates, Kliegl, Vasishth & Baayen, 2015). The lsmeans package (Length, 2016) was used for pairwise comparisons.

We predicted that the *you* perspective would lead to a stronger engagement with the text and that, in particular, participants induced with a positive mood would be sensitive to different perspectives. For the model, perspective, valence and film group were entered as fixed effects, participants as random intercepts and items were included as random intercepts with random slopes for perspective.

⁸ Because of known, and unresolved, problems in the reporting of parameter estimates for lmer models with no random intercepts (see Walker, 2014; Bolker, 2013), we focused on models that included random intercepts. For the RT data estimates of the variability of the intercepts for participants were correct at 0.

5.4.2.1. Mood effects on text processing

The analysis (of the entire text including all sentences, see example 5.1) showed a main effect of perspective (see Table 5.3) revealing that participants read generally faster in the personal (*you*) perspective (means for raw reading times per sentence: $M = 2502$, $SD = 1464$) than for the onlooker perspective ($M = 2635$, $SD = 1584$).

	Log Residual Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	-0.00	-0.02 – 0.02	.935
Perspective1	0.03	0.01 – 0.05	.020
Valence1	0.00	-0.02 – 0.02	.964
Film1	0.00	-0.01 – 0.01	.926
Perspective1:Valence1	0.00	-0.02 – 0.02	.955
Perspective1:Film1	0.01	0.00 – 0.02	.008
Valence1:Film1	0.00	-0.01 – 0.01	.400
Perspective1:Valence1:Film1	0.00	-0.01 – 0.01	.978
Random Parts			
σ^2		0.120	
$\tau_{00, \text{Part}}$		0.000	
$\tau_{00, \text{ItemNO}}$		0.003	

Table 5.3. LMM coefficients and effects of perspective (*you/he/she*), valence (*negative/positive*) and mood (*positive/negative*) on reading times for the whole text

We analysed whether processing was affected by whether participants were induced with a negative or positive mood. The effect of perspective was only evident for participants who were induced with a happy mood (with $M = 2633$ $SD = 1556$ for *he/she* and $M = 2445$, $SD = 1360$ for *you*, $\beta = 0.08$, $t(30.94) = 3.34$, $SE = 0.02$, $p = 0.002$) whereas comparisons showed no effects for participants induced with negative moods (with $M =$

2637, $SD = 1610$ for *he/she* and $M = 2555$, $SD = 1555$ for *you*, $t(30) = 1.28$, $p > 0.1$). The interaction between the induced mood (film group) and the perspective was significant (see Table 5.3).

5.4.2.2. Mood effects on the strength of the emotional representation (match/mismatch effects for last sentence (see example 5.1) only)

In an additional analysis, we examined reading times for the final sentence, which contained the explicit emotion that either matched or mismatched the emotion described in the text. As hypothesized, regardless of mood (induced or rated), inconsistent emotion words took longer to process (match: $M = 1847$ $SD = 797$ vs. mismatch: $M = 2445$, $SD = 1271$, see Table 5.4). We also found that the positively induced group read the last sentence faster ($M = 2125$, $SD = 934.33$) than the negatively induced group ($M = 2163$, $SD = 1239$, see Table 5.4).

	Log Residual Reading Times		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	0.12	0.09 – 0.16	<.001
Perspective1	-0.01	-0.04 – 0.03	.739
Valence1	-0.02	-0.06 – 0.01	.196
Match1	-0.24	-0.28 – -0.20	<.001
Film1	-0.04	-0.07 – -0.01	.009
Perspective1:Valence1	0.01	-0.03 – 0.04	.723
Perspective1:Match1	0.03	-0.01 – 0.07	.145
Valence1:Match1	0.04	-0.00 – 0.08	.051
Perspective1:Film1	0.01	-0.01 – 0.04	.306
Valence1:Film1	-0.01	-0.04 – 0.01	.332
Match1:Film1	0.08	0.04 – 0.12	<.001

Perspective1:Valence1:Match1	-0.01	-0.05 – 0.03	.564
Perspective1:Valence1:Film1	0.01	-0.02 – 0.04	.496
Perspective1:Match1:Film1	-0.00	-0.04 – 0.04	.938
Valence1:Match1:Film1	0.03	-0.01 – 0.07	.171
Perspective1:Val1:Match1:Film1	-0.02	-0.06 – 0.02	.276

Random Parts

σ^2	0.095
$\tau_{00, \text{Part}}$	0.000
$\tau_{00, \text{ItemNO}}$	0.002

Table 5.4. LMM coefficients and effects for perspective (you/he/she), valence (negative/positive), match/mismatch and mood (negative/positive) on reading times for last sentence

Comparing our mood induction groups, we found that match and mismatch effects differed between the positive and negative film group (see Table 5.5). Match and mismatch effects were stronger for the negative film group (match: $M = 1768$, $SD = 897$; mismatch: $M = 2566$, $SD = 1462$; $\beta = 0.32$, $t(889) = 11.41$, $SE = 0.03$, $p < 0.001$) than for the positive film group (match: $M = 1931$, $SD = 789$; mismatch: $M = 2319$, $SD = 1026$; $\beta = 0.17$, $t(889) = 5.8$, $SE = 0.03$, $p < 0.001$). This finding supports the prediction that mood affects the sensitivity to inconsistent (emotional) information. It was found that individuals in a negative mood react more strongly to emotional inconsistencies.

5.4.3. Ratings of Emotions

For self-ratings of emotions, we used the same procedures for the analysis as outlined for reading times. Linear Mixed Models included the same fixed factors i.e. perspective, valence, match/mismatch and mood (induced or self-rated). Again, models were assessed using the AIC and the PCA. The final model reported for this analysis included random intercepts for participants and items as well as random slopes of perspective, valence and match/mismatch for participants and perspective slopes for

items. Valence of the text (negative versus positive) influenced the ratings of emotions in response to the text (see Table 5.5).

	Self-Ratings of Emotion		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	5.01	4.77 – 5.25	<.001
Perspective1	-0.09	-0.29 – 0.12	.409
Valence1	-0.98	-1.23 – -0.73	<.001
Match1	-0.15	-0.29 – -0.02	.033
Film1	-0.06	-0.24 – 0.13	.566
Perspective1:Valence1	0.13	-0.07 – 0.32	.214
Perspective1:Match1	-0.02	-0.14 – 0.09	.697
Valence1:Match1	0.59	0.48 – 0.71	<.001
Perspective1:Film1	-0.17	-0.37 – 0.02	.083
Valence1:Film1	-0.04	-0.23 – 0.15	.675
Match1:Film1	-0.07	-0.20 – 0.07	.339
Perspective1:Valence1:Match1	-0.02	-0.16 – 0.11	.734
Perspective1:Valence1:Film1	-0.09	-0.27 – 0.10	.375
Perspective1:Match1:Film1	0.08	-0.04 – 0.20	.178
Valence1:Match1:Film1	0.13	0.02 – 0.25	.024
Perspective1:Valence1:Match1:Film1	-0.08	-0.22 – 0.05	.228
Random Parts			
σ^2		3.252	
$\tau_{00, \text{Part}}$		0.239	
$\tau_{00, \text{ItemNO}}$		0.131	

Table 5.5. LMM coefficients for perspective (you/he/she), valence (negative/positive), match/mismatch and mood (positive/negative) on self-ratings of emotions

Ratings in response to a positive text ($M = 6.00$, $SD = 1.70$) were more positive than those to a negative text ($M = 4.02$, $SD = 2.40$; see Table 5.5). Also, emotional ratings differed according to whether the explicit emotion in the final sentence matched the implicit emotion of the text (see Table 5.5). Ratings were higher for matches ($M = 5.16$, $SD = 2.24$) than for mismatches ($M = 4.86$, $SD = 2.36$).

The interaction between match/mismatch and valence was qualified by the induced mood (see Table 5.5). Figure 5.1 shows that, for participants in a happy mood presented with positive texts, emotional ratings were affected more strongly by the match/mismatch variable ($\beta = 1.89$, $t(158) = 7.26$, $SE = 0.26$, $p < 0.001$) than for the negative film group ($\beta = 1.09$, $t(155) = 4.31$, $SE = 0.25$, $p < 0.001$).

For positive texts, participants in a positive mood evaluated their own emotions more in line with the final emotion word and the outcome of the story than participants

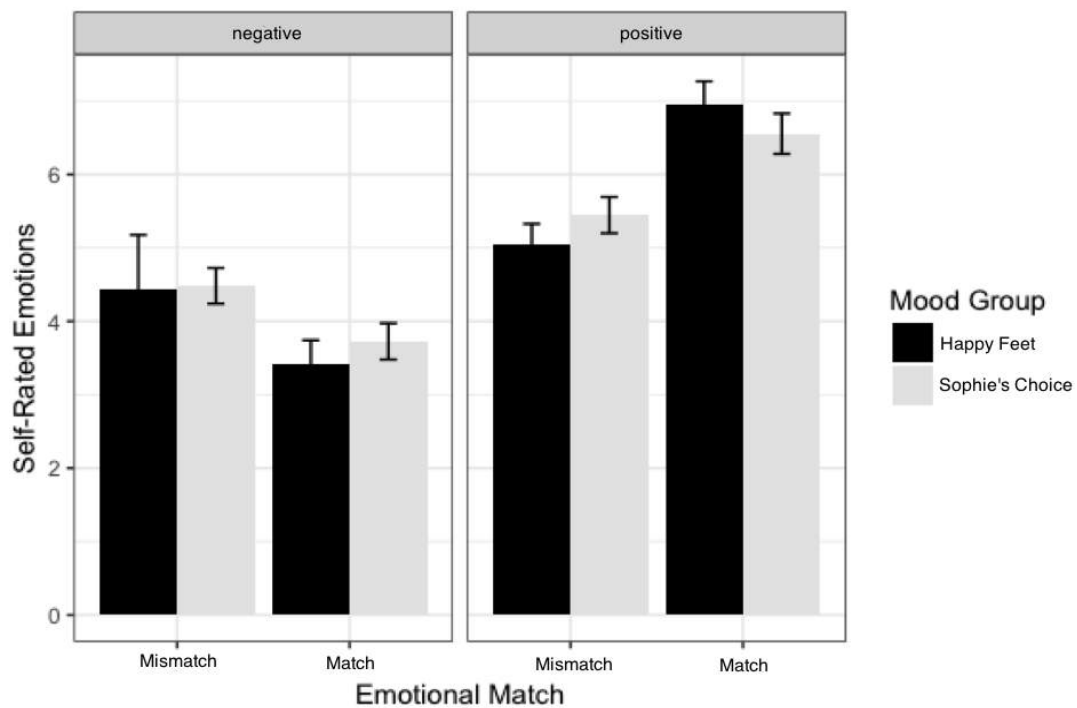


Figure 5.1. Ratings of emotions for mood groups (positive/negative), match/mismatch, and valence (positive/negative), (± 1 SE)

in negative moods. For negative texts, both groups rated their emotions equally negatively for emotional matches (i.e. negative outcomes).

5.5. Discussion

This experiment set out to explore how readers process emotional information about characters and how their engagement with the text (i.e. their perspective) is affected by their own emotions. In order to investigate mood effects on engagement with text and different perspectives, we performed a mood induction to provoke either a positive or a negative mood in our participants, in conjunction with the match/mismatch procedure used by Gernsbacher et al. (1992) and Gygax et al. (2003).

The mood induction was successful, and participants rated their mood in accordance with the valence of the film clip (negative or positive) with which they were presented at the beginning of the experiment. This mood effect was robust throughout the experiment. Therefore, as in previous experiments using mood induction techniques (Fitzgerald et al., 2011, Van Berkum et al., 2013), we assumed that participants processed the text passages in different mood states that were evoked through the mood induction.

We analysed reading times for entire texts that described an emotional situation from a personal perspective, or from an onlooker perspective. As predicted, it was found that participants generally read faster when they experienced the text from their own perspective. This result shows that processing is easier when readers can identify more intensively with the main character in the text, which is in line with the findings of Ruby and Decety (2001). We believe that readers found it easier to add new information to a situation model that included themselves as the protagonist, as the understanding of someone else's emotions involves more complex theory of mind and empathy processes. Moreover, we propose that readers who are personally addressed by the text are more

engaged (i.e. they are more interested about future events) with the text, leading to an increase in reading speed.

The effect of perspective was evident when readers were induced with a positive mood. Individuals in a happy mood state processed text including *you* more easily than texts including *he* or *she*. We suggest that readers in a positive mood are more sensitive to text features such as perspective. Moreover, we suggest that a positive mood causes individuals to be more self-focused and interested in new information relating to the self, whereas the effort of taking an outsider perspective on another character might lead to a decrease in a participant's positive mood state. However, individuals induced with a negative mood were not affected by the perspective, which might indicate that they are less sensitive to textual features such as perspective (Bohn-Gettler & Rapp, 2001; Chwilla, Virgillito & Vissers, 2011). Also, readers in the negative mood condition might be more objective i.e. less focused on the self, and try to relate to other characters to distract themselves from a negative mood (Herbert et al., 2008).

The reading time findings are also supported by the emotional ratings participants provided for each text (how the text made them feel). Ratings between participants induced with different moods did not differ overall. However, only those participants in an induced positive mood state rated texts including the pronoun *you* more positively (and the onlooker perspective more negatively), which shows the sensitivity to perspective cues as well as a general preference for information addressing the reader in person.

For the last sentence of the text, we found an interaction between the induced mood of the reader and the matching or mismatching emotion in the target sentence. We found that participants in negative mood states are more sensitive to the match and mismatch paradigm. This suggests that they are more focused on the actual textual content, rather than focusing on personal goals. Therefore, they are better able to

scrutinise the semantic coherence of text (Forgas & Eich, 2012; Krahmer, Van Dorst & Ummelen, 2004; Erber & Erber, 2001) whereas individuals in a positive mood focus on their own, self-relevant, goals such as preserving their positive emotional state. The suggestion that negatively induced participants scrutinise new information more, is also supported by their generally longer reading times for the last sentence.

In line with the results of Gernsbacher et al. (1992) and Gyax et al. (2003), we found that participants include emotional information in their mental representations. However, the strength of match/mismatch effects (reflecting the strength of the mental representation) depends on reading goals (i.e. preserving or achieving a positive mood state in the reader) and more generally on the mood state of the reader.

The interaction between the emotional match and mismatch and the mood of the reader was not affected by the valence of the text. This suggests that individuals in a positive mood engage in shallow processing strategies and negatively induced participants in deeper processing strategies regardless of whether the text is about negative or positive events (Forgas & Eich, 2012; Erber & Erber, 2001). These results are in line with the notions of different processing strategies and of mood biases (Herbert et al., 2008; Diener & Diener, 1996), but they are not in line with mood congruency theories (Egidi & Nusbaum, 2012; Bower, 1981). Also, our predictions that texts about events that are in line with an individuals' mood state lead to stronger mental representations and, hence, to stronger inconsistency effects, were not supported by our findings. Hence, our study gives evidence that processing is affected by mood for the reason that individuals of different moods participating in different processing strategies (Bohn-Gettler & Rapp, 2001) in order to arrive at or preserve a positive mood state (Forgas & Eich, 2012; Diener & Diener, 1996).

5.6. Conclusion

Both experimental manipulations influenced reading and emotion processing. We found that the perspective from which readers approached the text influenced the degree to which they engaged with the text and the strength of their representation of it. Also, the readers' own emotions (i.e. their mood) affected how individuals approach a text and how deeply they engaged with new information. A personal perspective, addressing the reader and setting him/her in the situation in the text, facilitated processing and led to a stronger mental representation. We also found that the mood of readers affect their processing strategy. It was found that participants in a negative mood engage in deep processing, and are more sensitive to inconsistent information in text. We believe that participants in a positive mood try to maintain their positive mood by not engaging with new information on an in-depth level. Further studies might explore whether mood and perspective affect performance in text-based memory tasks.

**6. Tracking *your* Emotions – an Eye-Tracking Study on
Readers Engagement with Perspective during Text
Comprehension**

Scarlett Child,

Jane Oakhill &

Alan Garnham

University of Sussex

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6.1. Abstract

In chapter 4 we reported two studies that explored how perspective affects processing of emotional texts. We found evidence that readers read (positive) texts faster and that they build up stronger representations when they experience the text from a personal perspective. In this chapter, we want to disentangle these effects and see whether perspective effects change during the course of the text as readers become more familiar with the characters. We also wanted to know, whether effects arise directly at the pronouns themselves. We hypothesised that perspective effects arise at pronouns and that faster reading times for *you* are dependent on the position of the pronoun in the text. We predict that perspective effects mitigate as the text proceeds, as readers become more familiar with the characters (particularly with *he/she*) and also, because they realise the difference between themselves and the character addressed by *you*. We also predict that readers refuse to engage with the personal perspective when reading about negative events. Hence, we presented texts that included either a personal perspective (*you*) or an onlooker perspective (*he/she*). We measured whether fixations on the pronouns themselves differed as a function of perspective, and whether fixations on pronouns were affected by the emotional valence of the text which was either positive or negative. It was found that early in the text, processing of *you* is easier than *he* or *she*. However, as the character referred to by *he/she* becomes more familiar, fixations on *he/she* decrease, specifically in negative contexts. We believe that this effect is due to stronger empathy in readers when reading about increasingly familiar characters experiencing negative events. Fixations on *you* did not decrease showing that readers did not become more familiar and build up a distance between themselves and the character.

Keywords: eye-tracking, pronouns, text comprehension, perspective

6.2. Introduction

Research on situation models for text comprehension has demonstrated that readers take the perspective of the protagonist and experience the situation in text by *putting themselves in the character's shoes*. Studies have also demonstrated that readers track different types of information (e.g. *spatial*, Zwaan, Madden, Yaxley & Aveyard, 2004; or information about characters' *goals*, Albrecht, O'Brien, Mason & Myers, 1995) from the viewpoint of the character. Some literary theorists (e.g. Schofield, 1998) argue that this engagement with the character's point of view can be strengthened via cues or instructions given to readers within the text, for instance through use of the personal pronoun *you*. Our study uses eye-tracking measures to explore how readers engage with emotional situations in text when they are *invited* (Schofield, 1998) to experience the situation from a personal point of view.

In order to create the personal point of view, some studies have used explicit instructions in which readers were told to take the perspective of the character, whilst other researchers used more implicit prompts within the text. For example, Brunyé, Dittmann, Mahoney, Augustyn & Taylor (2009) found that readers engage with text from a personal point of view through use of the pronoun *you*. Sentences containing an active performance e.g. (*slicing of a tomato*) were presented to readers. The agent of the sentence was referred to with different pronouns e.g. *you*, or *he/she*. After the reading task, participants were presented with a picture of the action that either made them spectators to someone else performing the action, or as though performing the action themselves. Participants were asked to decide whether the action in the picture was consistent with the action in the sentence before. Reaction times were faster for perspectives that were congruent between the sentence and the pictures, i.e. response

times were faster for pictures from the personal perspective after having read sentences including *you*, and decisions were faster for pictures from the spectator perspective after reading sentences including *he/she*. Therefore, the personal pronoun *you* seems to prompt readers to assume a more personal perspective during text comprehension. In a similar experiment, Brunyé, Ditman, Mahoney and Taylor (2011) also found that affective responses given by participants were stronger (more in line with the valence of the text) when the *you* perspective was used. This finding shows that readers engage more with and develop stronger mental representations of the emotional valence in texts when the text is written from the personal perspective.

So far, experimental research has focused on how the reader's perspective affects responses given *after* text comprehension, i.e. how text details are represented or memorized (Brunyé et al., 2011, Brunyé, et al., 2009). Recently, Child, Oakhill & Garnham (2018) explored the effect of perspective on text comprehension as it happens. They found that individuals read texts including the personal perspective (using the personal pronoun *you*) faster than texts including the onlooker perspective. This finding was more pronounced for positive texts. However the authors found that the resulting mental representation of the emotion in the text was stronger for the personal perspective in negative contexts. Child et al.'s findings are based on reading times for individual texts and sentences. Our study aims to explore comprehension differences between different perspectives in more detail, and to investigate whether the readers' focus on certain types of text elements (i.e. on the pronoun regions) is affected by perspective cues. It also investigates whether valence effects change in the course of the reading process. In order to achieve these aims, our study uses eye-tracking measures to monitor reading behaviour.

Eye-tracking measurements have emerged as a useful tool to examine and unmask comprehension processes (Rayner, 2009). Fixation times are taken as an indicator of the

actual time needed to process particular text elements (Carpenter & Just, 1977). First-pass measures of reading, for example gaze duration, are associated with early processing stages (lexical access and encoding) and can vary as a function of lexical complexity or frequency. Also, the occurrence of unexpected text elements can lead to longer fixation durations due to encoding problems (Rayner, 1998). We assume that even though the second person perspective is less commonly used for narrative fiction, encoding of information might be easier when this information is related to the pronoun *you*. Hence, we predict shorter fixation durations on *you*, due to the reader's personal engagement and the increased accessibility of the mental representation.

For our study, we are not only interested in whether early processing components are affected by perspective, but also whether integration processes are facilitated through the use of the personal pronoun *you*. As argued by Rayner (1998), regressive eye-movements i.e. movements backwards to previous sections in the text (from right-to-left) can be associated with the reader's attempt to link new information with previous information. Therefore, when readers detect inconsistencies between or have difficulties connecting earlier and more recent information, they engage in more backtracking, which leads to more regressive eye-movements. We, therefore, suggest that the perspective and the level of engagement with the text affects reading behaviour and therefore reading measures during comprehension.

Previous research has shown that the personal perspective, as prompted by pronouns, affects readers' engagement with text i.e. that it invites them to assume the agent role, resulting in faster processing of (Child et al., 2018) and stronger affective responses to the text (Brunyé et al., 2011, Child et al., 2018). Our study takes a closer look at these findings, and is to our knowledge the first to investigate where these perspective effects arise and to examine the immediate effects of perspective on fixation

durations on the pronouns themselves. In line with previous research (Child et al., 2018) we assume that readers' engagement with perspective is affected by the emotional valence of the text. Previous research has found evidence that emotions are particularly relevant to establish coherence throughout the text and that readers are sensitive to emotional changes in the character, as they include emotional information in their mental representations (Gernsbacher, Goldsmith & Robertson, 1992, de Vega, León & Díaz, 1996; Gygax, Oakhill & Garnham, 2003). It has also been found that readers are particularly engaged when reading *emotional* texts (Cupchick, Oatley & Vorderer, 1998; Mar, Oatley, Djikic & Mullin, 2011) and that readers' engagement with perspective is affected by whether the text describes a positive or negative situation (Child et al., 2018). Researchers have found that readers engage more strongly with negative events (Altmann, Bohrn, Lubrich, Menninghaus & Jacobs, 2012). Therefore, we will present texts with characters either experiencing a positive or negative emotional situation, and we will compare perspective effects at the pronoun regions for both valences. Taking into account the findings of previous research (Child et al., 2018) we expect that readers engage more strongly with the emotional valence of the text when reading about a negative event and therefore we assume that fixation times on pronouns in a negative context are cumulatively shorter. However, we believe that perspective and valence effects might depend on whether readers encounter the pronoun for the first time or whether they are already engaged with the text. Previous research (Nieuwland & Van Berkum, 2006) has demonstrated that readers' ability to integrate new information highly depends on the context and that a more elaborate context can change the perception of how logical/illogical new information is. For example, Nieuwland and Van Berkum (2006) found that new information that is not coherent with an individuals' world knowledge (a cup that talks) is integrated with ease when the context describes a situation

that is not based on real-world occurrences (e.g. if this phenomenon occurs in Alice in Wonderland). Hence, to look in more detail at where valence and perspective effects arise, we included the pronoun area in our analysis (taking account of the number of occurrences/repetitions of the pronoun in the text). We believe that valence and perspective effects will become less pronounced later in the text as the reader becomes more familiar with the characters, and as they become more aware that *you* is distinct from their representation of the *self* (i.e. as new information is inconsistent with their knowledge about themselves, Nieuwland and Van Berkum, 2006) and hence, processing should not remain easier for you than for a character referred to by *he/she*.

6.3. Method

6.3.1. Participants

Forty undergraduate students of the University of Sussex were recruited. Participants' age ranged from 18 to 28 years with $M = 20.39$ and $SD = 2.32$. Before signing up electronically on the Sona recruitment platform of the university, and again before the experiment, participants were asked about their first language and their reading ability. Individuals that were not English native speakers or that showed indications of reading problems or disabilities were excluded from the experiment. Participants received course credit or money for their participation.

6.3.2. Apparatus

Eye-movements were recorded via a table-mounted infrared camera and an SR-Eyelink 1000 eye-tracker (SR Research, Ottawa, Canada) with a sampling rate of 1000 Hz. Eye-movements (pupil size and corneal reflection) were recorded from the right eye of each individual. Items were presented using the Experiment Builder software (SR Research)

on a 21.5 inch monitor (iMac, with Windows XP 2002 operating system). Participants were asked to sit so that they could place their head in the chinrest and forehead restraint which was placed at about 60 cm from the screen to minimize head movements. Before the start of the experiment, a thirteen-point spherical calibration was performed (to a 0.5 degrees calibration average). A drift checks was carried out before the start of each new item, and recalibration was performed, if necessary.

6.3.3. Items

Twenty-four experimental items were taken from the study by Child et al. (2018) and eight similar items were generated in order to arrive at a total of 32 items. The lengths of the passages ranged from 47 – 96 words (251 – 501 characters), with $M = 70.94$, $SD = 13.05$ (for characters: $M = 375.11$, $SD = 68.49$). Texts presented a character experiencing either a negative or a positive situation (i.e. 16 items of 32 in each valence). Throughout the text, the emotion unfolded only implicitly (see example 6.1).

Example 6.1.

6.1a. ‘You’ perspective: *With a full bag in your hand¹, you make your way² home. It feels quite heavy, but that does not really matter. You had³ assumed that you would⁴ have to spend so much more today. You had⁵ been trying to save up for a while, and this was a real bargain. You look⁶ at your bag⁷ with great satisfaction.*

6.1b. ‘He/She’ perspective: *With a full bag in his hand¹, Peter makes his way² home. It feels quite heavy, but that does not really matter. He had³ assumed that he would⁴ have to spend so much more today. He had⁵ been trying to save up for a while, and this was a real bargain. He looks⁶ at his bag⁷ with great satisfaction.*

The final sentence always contained an explicit emotion word reflecting the valence of the text. Each text occurred in both perspective conditions, including either the personal pronoun ‘you’ or, for the onlooker perspective, containing a proper name for the

first mention of the character followed by the pronouns ‘*he*’ or ‘*she*’. For items including the onlooker perspective, the gender of the characters was counterbalanced across items.

Texts were separated into multiple interest areas, each of which included a pronoun (i.e. either *you* or *he/she*). An individual interest area (IA) also included words adjacent to the actual pronoun (+/- one word, as long as those words were part of the same sentence), because previous researchers have shown that readers are likely to skip pronouns (function words) during reading (e.g. Rayner, 1998).⁹ We assigned ordinal numbers to each pronoun area in the text (for example the first pronoun was included as *I*, see example 6.1, underlined areas, seven IAs in total). Texts included up to 13 pronouns ($M = 7.22$, $SD = 2.47$). Pronoun areas (number and length) did not differ between perspective conditions.

Twenty-four items were added as distractors. Distractor (filler) items were taken from Gygax et al.’s (2003) study and manipulated so that half included the third person perspective and the other half included the first person ‘*I*’ perspective. Fillers also referred to emotional situations but were ambiguous in their outcome (final sentence).

6.3.4. Design

The study followed a 2 x 2 mixed-measures design, with valence (in-between factor for items; *negative* versus *positive*) and perspective (‘*you*’ versus ‘*he/she*’) as factors (Child et al., 2018). We also included interest area as a continuous factor (ordinal, ranging from 3 -14).

Each participant was presented with one of two lists following a Latin Square Design, with each list containing the same number of items (32 experimental items plus

⁹ We also set an interest area for the emotion word at the end of the passage to examine effects of perspective on that region. However, we did not find perspective (or valence) effects for that area.

24 filler items) and the same number of experimental items in each condition (eight items per condition). Each item only occurred once per list, including either the pronoun *you* or *he/she*. The number (and length) of pronoun areas did not differ between lists.

6.3.5. Procedure

Items were individually presented in a different randomized order for each participant. Participants were asked to read the texts and press a button on the keyboard after reading. After this response, participants were asked to rate their own emotional response to the text on a scale from 1 (*negative*) to 10 (*positive*). Ratings were given on a rating bar (on a continuous line) using the mouse. To proceed to the next item, participants were asked to click on a proceed button again using the mouse. The next trial started as soon as participants focused on the black dot appearing for the drift check.

6.4. Results

6.4.1. Eye-Movement Data

The data were extracted using the fixation report function in the Data Viewer software and eye-tracking measures were obtained through the Get Reading Measures script provided by SR Research (SR Research, 2011). It is suggested that readers are not able to fully process text in less than 50 milliseconds (Jegerski & VanPatten, 2013; Inhoff & Radach, 1998). Therefore, we excluded fixations of less than 50ms from the further analysis. Linear mixed effect models were used to analyse the remaining data. The analysis was run in R (R Core Team; 2013, version 3.4.3.) using the lme4 packages (Bates, Maechler, Bolker & Walker, 2016) and lmeTest (Kuznetsova, Brockhoff, & Christensen, 2015) for Satterthwaite approximations for the degrees of freedom. Perspective (personal *you*; onlooker *he/she*), valence (*negative/ positive*) and finally the

pronoun area were included as fixed factors. Participants as well as items were included as random factors with both intercepts and slopes included where possible.¹¹ The default restricted maximum likelihood estimations (provided by the lme4 package) were used. To assess model fit, models that satisfied the convergence criteria were compared using the AIC (Akaike Information Criterion, Bates, 2010). We also carried out a Principal Component Analyses for each of the sets of random effects to check for overparametisation (RePsychLing package, Baayen, Bates, Kliegl & Vasishth, 2015). We report models with the lowest calculated AICs and that did not show signs of overfitting (Bates, Kliegl, Vasishth & Baayen, 2015). We used the sjPlot package to create tables for LMM coefficients (Lüdtke, 2018). Contrasts were set using sum contrasts.

¹¹ Some models did not converge when random slopes were included. Where this was the case, we report more restricted models including random intercepts only (Angele, Laishley, Rayner & Liversedge, 2014).

Effects of perspective and of valence might affect the processing of new information at different stages such as encoding only or integration only, or effects might be evident for processing more generally. Hence, we analysed early measures on encoding (i.e. gaze duration, similar to first-fixation duration; Liversedge, Peterson & Pickering, 1998; the first fixation until a region is left to the left or right), late measures (i.e. regression-path duration, all fixations until a region is left to the right, Liversedge et al. 1998) and the total duration (i.e. sum of all fixations on a region; Liversedge et al, 1998; Rayner, 1998). We found main effects of all three factors on *gaze durations* (see Table 6.1).

	GAZE DURATION		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	342.95	322.63 – 363.26	<.001
Valence	-15.43	-29.40 – -1.47	.035
Perspective	-35.52	-46.30 – -24.75	<.001
Pronoun Region	-4.51	-6.44 – -2.58	<.001
Valence:Perspective	15.12	4.35 – 25.89	.007
Valence:Pronoun Region	3.64	1.71 – 5.57	<.001
Perspective:PronounRegion	6.61	4.71 – 8.50	<.001
Valence:Perspective:Pronoun Region	-3.77	-5.65 – -1.89	<.001
Random Parts			
σ^2		32783.985	
$\tau_{00, \text{part}}$		2364.695	
$\tau_{00, \text{trial}}$		969.207	

Table 6.1. LMM coefficients and effects of perspective (you/he\she), valence (negative/positive) and pronoun region on Gaze Duration

For perspective, the occurrence of the pronoun *you* lead to faster processing ($M = 313.10$, $SD = 189.95$) compared to the pronouns *he/she* ($M = 331.05$, $SD = 192.42$). For the valence of the text, positive texts ($M = 321.91$, $SD = 190.24$) had shorter gaze

durations than negative texts ($M = 322.45$, $SD = 192.69$). For the pronoun areas, gaze duration decreased with the ordinal position of the pronouns, i.e. later occurrences of the

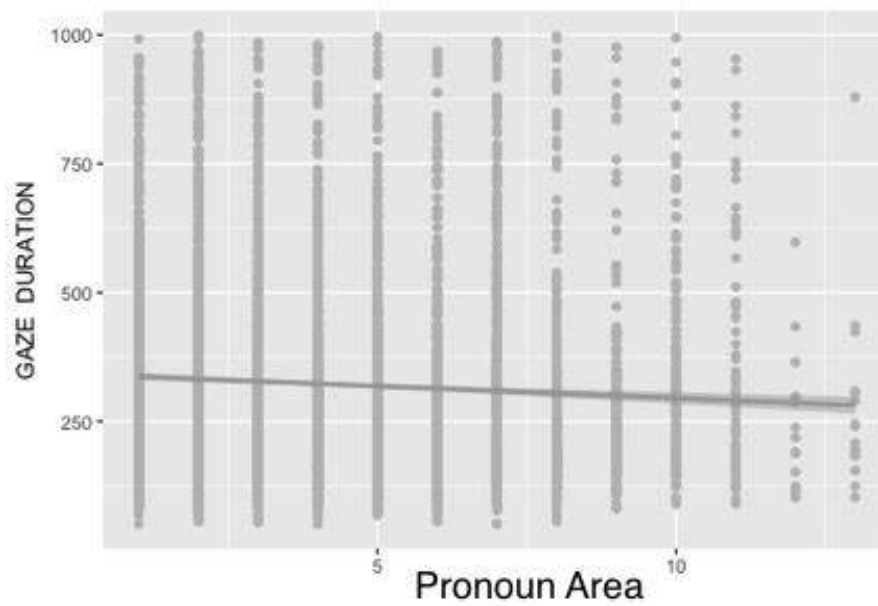


Figure 6.1. Gaze Durations for individual pronoun areas (1-14)

pronoun were fixated on for shorter periods (see Figure 6.1).

We found a three-way interaction of all factors (valence, pronoun region and perspective, see Table 6.1). As can be seen in Figure 6.2, the interaction between pronoun region and valence was prominent in the onlooker perspective, however, for the personal perspective fixations remained similar for negative and positive texts across regions.

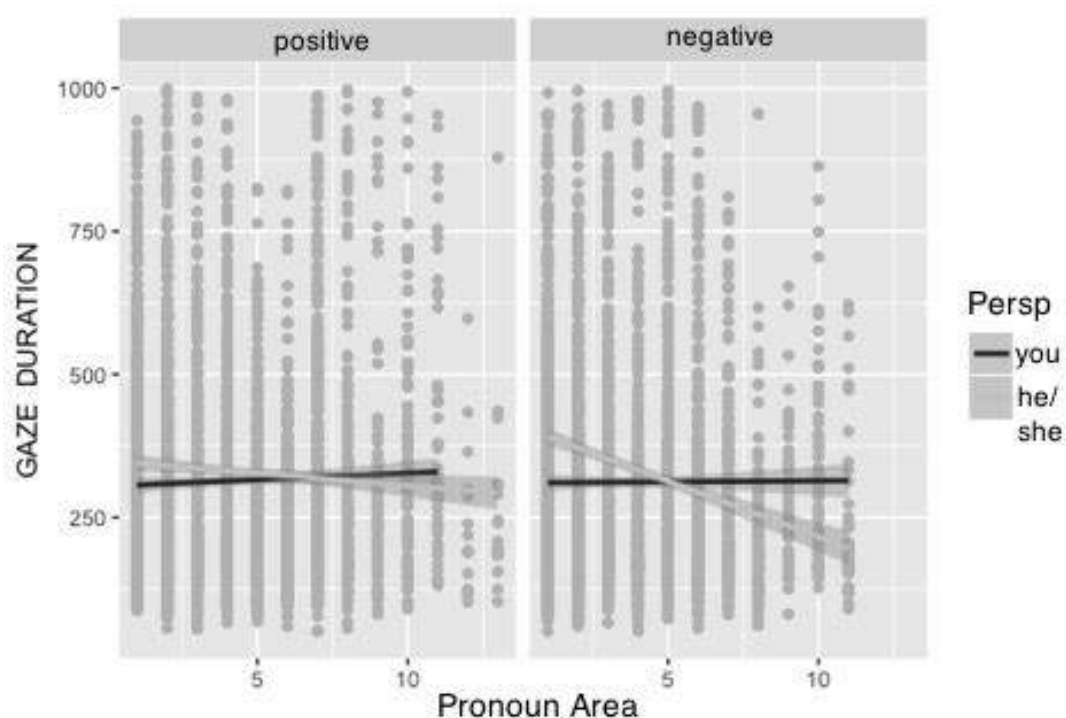


Figure 6.2. Gaze Durations for pronoun areas by valence and perspective

The results so far indicate that the perspective, valence and the reoccurrence of pronouns influence reading behaviour during early processing.

A similar pattern of results was found for the *regression path duration* (all fixations on a region and regressive regions until the region is left in a progressive manner, see Table 6.2).

	REGRESSION PATH DURATION		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	376.23	352.38 – 400.08	<.001
Valence	-0.50	-19.02 – 18.02	.958
Perspective	-26.84	-40.23 – -13.44	<.001
Pronoun Region	-1.72	-3.92 – 0.47	.124
Valence:Perspective	13.67	0.29 – 27.06	.050
Valence:Pronoun Region	-0.29	-2.48 – 1.90	.797
Perspective: Pronoun Region	4.32	2.16 – 6.48	<.001
Valence:Perspective:Pronoun Region	-2.55	-4.70 – -0.40	.020
Random Parts			
σ^2	38050.842		
$\tau_{00, \text{part}}$	2448.343		
$\tau_{00, \text{trial}}$	2028.107		

Table 6.2. LMM coefficients and effects of perspective (you/he\she), valence (negative/positive) and pronoun region on Regression Path Duration

Again, we found the perspective effect with shorter times for the personal perspective (*you*: $M = 354.18$, $SD = 207.67$; *he/she*: $M = 372.35$, $SD = 204.01$). For the regression path duration, we did not find main effects of valence or pronoun area, and the interaction of those two variables was not significant for this measure. Again we found a three-way interaction between all measures (see Table 6.2) which is shown in Figure 6.3.

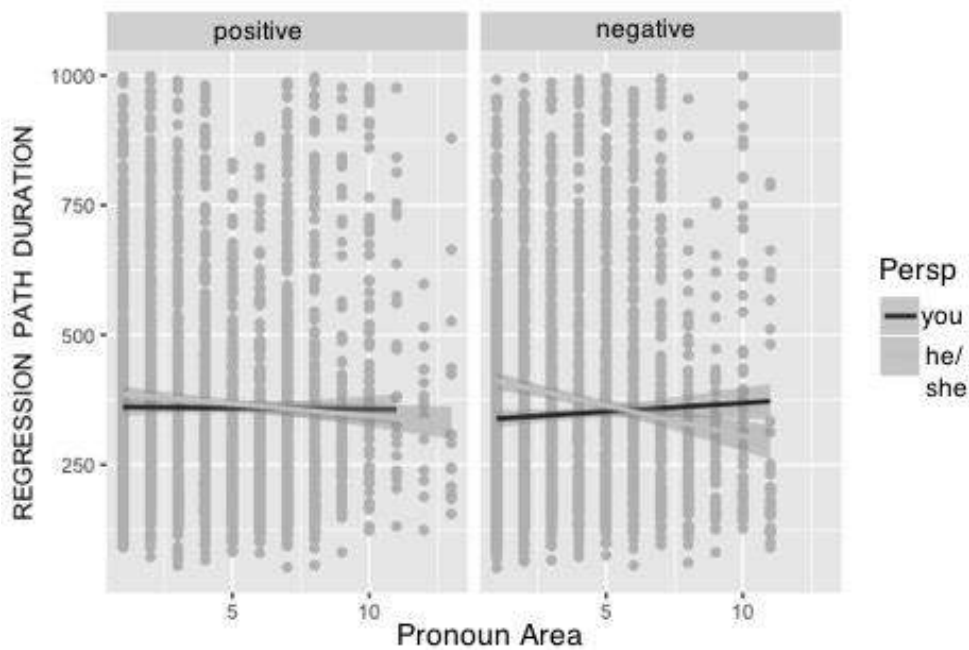


Figure 6.3. Regression Path Duration for pronoun areas by valence and perspective

Finally, we analysed the *total duration* (see Table 6.3) (summing up all fixations in that region). Times were again shorter for the personal perspective (*you*: $M = 369, 96$, $SD = 209.26$) as compared to the onlooker perspective (*he/she*: $M = 391.52$, $SD = 213.86$) and reading times decreased as the text proceeded. For the total fixation duration, we did not find a main effect of valence (see Table 6.3). Again, the three way interaction of perspective, valence and pronoun area was evident (see Table 6.3; Figure 6.4). For negative texts, participants read first faster for the *you* perspective, but as the text proceeds, reading times became faster for the onlooker perspective (*he/she*).

	TOTAL DURATION		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	407.46	384.02 – 430.91	<.001
Valence	-10.64	-27.06 – 5.78	.210
Perspective	-36.71	-49.16 – -24.25	<.001

Pronoun Region	-5.48	-7.56 – -3.39	<.001
Valence:Perspective	11.34	-1.11 – 23.78	.079
Valence:Pronoun Region	2.66	0.57 – 4.74	.013
Perspective:Pronoun Region	6.30	4.26 – 8.35	<.001
Valence:Perspective:Pronoun Region	-3.15	-5.19 – -1.11	.002
Random Parts			
σ^2		39938.853	
$\tau_{00, \text{part}}$		3049.546	
$\tau_{00, \text{trial}}$		1467.570	

Table 6.3. LMM coefficients and effects of perspective (you/he\she), valence (negative/positive) and pronoun region on Total Duration

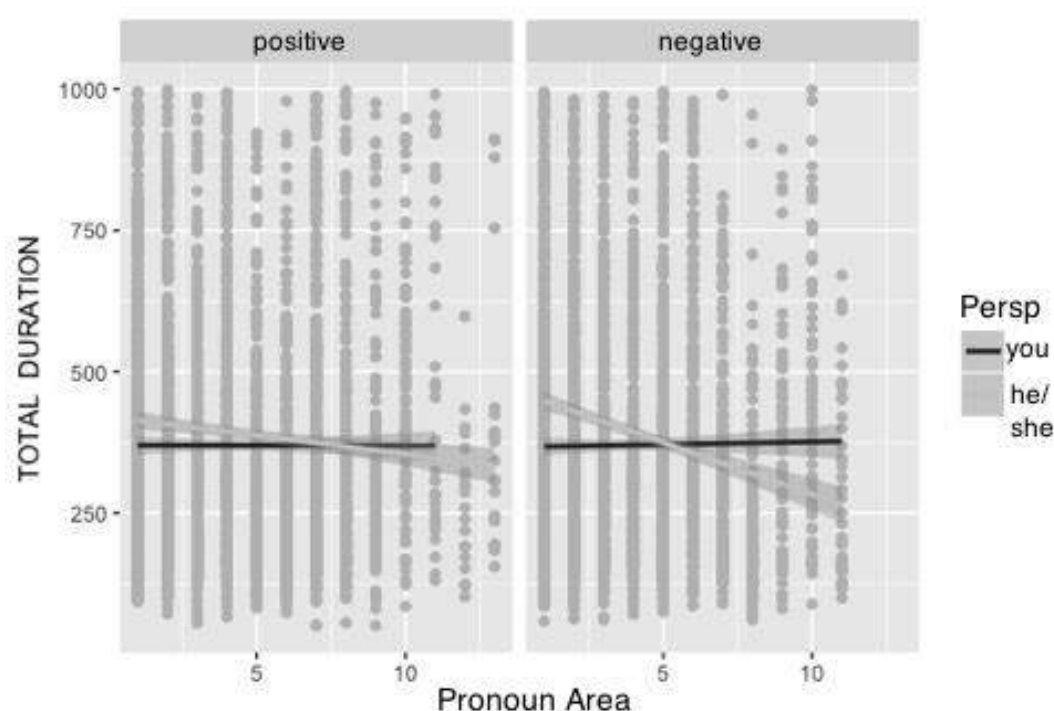


Figure 6.4. Total Durations for pronoun areas by valence and perspective

For all measures, we found a perspective effect with shorter times for the *you* perspective compared to the onlooker perspective. For most measures (except for regression path duration) we found an effect of pronoun area, with shorter times for the

pronoun region as the text proceeded. For all measures, the three-way interaction between the three factors (perspective, valence and pronoun area) was significant, showing that the interaction of valence and pronoun area was specific to the onlooker perspective. For the pronouns *he/she*, readers' times decreased as the text proceeded. We found evidence that the pronouns that are used in text (prompting readers to either take a personal perspective or onlooker perspective) affect early and late processing stages. We also found that times to process pronouns that occur in negative and positive texts and times to process pronouns that occur at different times in the text, differ as a function of perspective.

6.4.2. Emotional Responses

We used the same procedure and type of analysis as explained for the eye-movement data, except that pronoun region was not a factor in this analysis. Participants rated their emotions on a scale from 0 – 100 (how happy the text made them feel, 0 = *not happy at all*; 100 = *very happy*, integer scale). Individuals' emotional response was in line with the texts' valence i.e. they rated their own emotions more positive for positive texts ($M = 68.98$, $SD = 15.59$) and more negative after having read negative texts ($M = 24.82$, $SD = 14.92$, see Table 6.4).

	Emotional Responses		
	<i>B</i>	<i>CI</i>	<i>p</i>
Fixed Parts			
(Intercept)	46.91	44.67 – 49.15	<.001
Valence	22.08	19.98 – 24.19	<.001
Perspective	0.17	-0.59 – 0.92	.670
Valence:Perspective	1.38	0.63 – 2.13	<.001
Random Parts			

σ^2	194.829
τ_{00} , Part	6.395
τ_{00} , trial	32.182

Table 6.4. LMM coefficients and effects of perspective (you/he\she), valence (negative/positive) and pronoun region on Emotional Responses

Also, for negative texts, participants rated their own emotions similarly for texts including *you* ($M = 23.61$, $SD = 14.66$) and texts including *he/she* ($M = 26.02$, $SD = 15.10$). For positive texts, the personal perspective ($M = 70.50$, $SD = 15.98$) led to more positive emotional responses than the onlooker perspective ($M = 67.46$, $SD = 15.07$; $\beta = 3.09$, $SE = 1.09$, $t(871) = 2.84$, $p = 0.024$). The interaction between valence and perspective was significant (see Table 6.4). For texts including the pronoun *you*, participants' emotional ratings were overall more strongly in line with the valence of the text (see Figure 6.5).

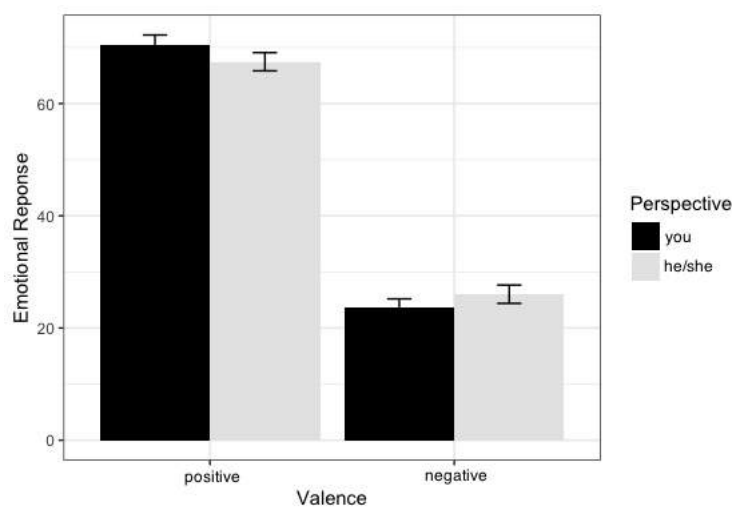


Figure 6.5. Emotional Responses for valence (positive/negative) and perspectives (you & he/she, (+-1 SE))

6.5. Discussion

Our study investigated reading behaviour as a function of readers' engagement with perspective. Our study is (to our knowledge) one of the first that gives evidence that

perspective effects are evident directly at the pronoun. In an eye-tracking experiment, interest areas including personal pronouns were analysed and we found that the perspective (the use of the pronoun *you* or *he/she*) affected early and late processing stages when reading the pronoun.

For most measures, early and late, we found a perspective effect, with shorter fixation times on the pronoun *you*. This is in line with the study presented by Child et al. (2018), who found shorter reading times for passages including the pronoun *you*. Our study supports the findings of Child et al. (2018) and shows that shorter reading times for passages that include the personal perspective might be based on shorter fixations on the pronoun itself. Processing of the pronoun *you* might be facilitated as the pronoun refers to and activates the representation of the self rather than the representation of an *external* (Brunyé et al., 2009) entity. As suggested by Ruby and Decety (2001), the simulation of an action performed by someone else (as opposed to the self) requires additional theory of mind processes. Hence, information processing is more complex when the information does not refer to the self. Also, we suggest that the representation that is activated by *you* (referring to the self) is more salient (more elaborate) and more easily activated than a representation of another (less familiar) character.

We found that the engagement with perspective (the fixation time differences between pronouns) was stronger for negative texts and that it differs as a function of the location of the pronoun within the text. Our finding that the readers' tendency to fixate less on the pronoun *you* (especially in negative texts), is based on measures taken for early occurrences of the pronoun within the text. As the text proceeded, readers' fixations for the pronoun *he/she* decreased. This pattern of results was stronger for negative texts for which reading times on *he/she* were finally (later in the text) shorter than on the pronoun *you*. This finding suggests that by repeatedly activating the representation that is referred

to by *he/she*, processing of the pronoun becomes faster and easier, which is in line with our prediction that the first build-up and activation of a character representation that is different from the self is more complex than processing *you* (as reference to the representation of the self). As proposed by Rayner (1977) fixations are shorter on more familiar text content. Hence, as the character (referred to by *he/she*) becomes more familiar, fixation times decrease. Familiarity to *you* (i.e. to *yourself*) does not change within the course of the text.

As predicted by Altmann et al. (2012), readers tend to engage more strongly with negatively valenced texts due to a more empathic engagement with the character. It was found that fixations on *he/she* were longer in a negative context in the beginning of the passage but that they decreased more strongly than for positive items in the course of the text. We propose that readers feel more empathy for characters (*he/she*) experiencing a negative situation. This increase empathic engagement leads to a higher sense of familiarity and hence, to shorter fixations. Whereas the engagement with the character referred to by *he/she* changed over the course of the text (and with a negative valence) fixations on the pronoun *you* were similar across the text and for both valences. As proposed by Kancandes (1993), for readers the use of the *you* perspective is a *seduction to feel addressed and a realization that the call is not quite accurate*. Hence, when first addressed by *you*, readers can easily establish a representation that includes themselves as the protagonist and fixations are shorter than for *he/she*. However, the representation including *you* does not become more familiar within the course of the text as readers already have a fixed and stable representation about themselves which is not easily altered or affected by new information about narrative (and hence fictional) events. Therefore, integration and encoding for *you* did not show marked differences between areas or valences.

We appreciate that the judgement of ones' own emotion after the reading task might impact the way readers focus on the emotional content in following trials. It might be assumed that self-ratings of emotions become more similar to the valence of the text (more negative for negative items and more positive for positive items) the more a reader is prompted to judge their own emotions. The effects of an affective judgment task on the cognitive understanding of emotions in text (and whether affective responses get stronger with more exposure to emotional content) is an interesting point to address for future studies. However, as judgement tasks were part of every trial and constant for each condition, these effects should not present a confound to our results.

To conclude, our study found evidence that readers fixate differently on pronouns as a function of perspective and that processing of pronouns is easier when the pronoun refers to *you*. This effect is specifically evident for negative contexts. Also, the facilitated processing of the second pronoun, addressing the reader, is specific to pronouns occurring early in the text. As readers become more familiar with the character that is referred to by he/she, processing of those pronouns (third person) becomes easier. Again, this finding was enhanced for negative contexts, suggesting that readers are more sensitive to perspective cues when reading about negative events.

7. Discussion

7.1. Summary of Results

This thesis set out to explore the effects of emotions in text on reading and processing. Nine experiments were designed to test how character emotions affect mental representations and comprehension processes. In chapter 2, an experiment was presented that explores the role of emotions in sentence processing and queries whether emotionally qualified nouns are more easily retrieved than those that are non-emotionally qualified. It was found that readers take longer to encode and process qualified nouns (emotional or non-emotional). Readers needed longer to build up a more complex representation that includes more associative knowledge and features. The complexity effect arose earlier (at the head noun) and was more pronounced for nouns qualified by two adjectives, one of which was emotional, giving evidence that in this condition, particularly rich representations had to be build up. Moreover, it was found that emotionally qualified nouns (either with one or two adjectives, one of which emotional) were retrieved more easily than bare nouns. This result suggests that emotional information is specifically salient and hence, it facilitates retrieval.

In the following chapters, experiments explored the role of emotions for text processing rather than sentence processing. In chapter 3, it was investigated how readers deal with information about two different characters. Another question was whether readers try to assign new emotional information to a character that already includes the same type of (emotional) information even when the new information could be connected to a second character that is emotionally less elaborate. Experiment 3.1 showed that readers try to integrate emotional information with a representation of an already

emotional character, even if the new information is inconsistent with the previous information that has already associated with the character. This finding shows that readers recognise information of the same type (i.e. emotional) and that they try to link new information of a certain type to a representation that is already associated with the same type of information. Hence, readers tried to link new emotional information with emotional characters. The result of experiment 3.2 were similar to those of experiment 3.1, and showed that readers try to integrate new emotional information with a more elaborately emotionally qualified character rather than with an emotionally less developed character. However, results also revealed that readers are able to attribute mismatching emotional information (with regard to the emotionally more salient character) to an emotionally less qualified entity. Similar to experiment 3.1, the results showed that readers have a preference to assign information of a certain type to an entity that shares more information of the same type. Also, in a third study within this chapter, the aim was to test whether emotionally qualified characters are more salient than non-emotional characters. The results provided evidence that readers try to assign emotional information to already emotional characters.

Experiment 3.3 aimed to highlight the importance of emotional information for processing and test whether emotional information (rather than the amount of information) causes representations to be more salient. It was found that processing for positive and neutral passages was similar (and in line with the results of experiments 3.1 and 3.2). However, for negative items, it was found that emotional matches (regardless of character) as well as a mismatch followed by the name of the more elaborated character were read with similar speed. Only emotional mismatches followed by the name of the second character lead to processing (integration) problems (slower reading times). The results show that negative emotions leads to a more empathic engagement with the

situation and hence, to a stronger representation that is more in focus for the reader. Information that is somehow in line with the attributes included in this representation are integrated more easily, whereas information that is not in line (in respect of the character or the emotional valence) can only be integrated with difficulty.

The experiments in chapter 3 gave evidence that readers focus more on emotionally (more) elaborated characters, and that information that is in line with the more salient representation is integrated more easily. Also, it was found that specifically negative emotions lead to stronger (more salient) emotional representations.

Chapter 4 introduced the notion that readers' processing of emotions might be affected by the perspective that is taken during the reading process. Two experiments gave evidence that the personal perspective increases engagement with emotions in text. It was found that readers process positive texts in particular more quickly when they are addressed with the pronoun *you*. It was suggested that readers are reluctant to access negative text from a personal perspective (as a protection mechanism), but that processing of positive text is facilitated due to mental representations that include *you* as the protagonist (as the self is more familiar than a new external character). A second experiment found that the resulting emotional mental representation is stronger (more salient) for the personal perspective and this effect was enhanced for negative texts. This effect was revealed by stronger mismatch effects when the implicit emotion of the text did not match with a final explicit emotion word presented at the end of the text. Hence, it was proposed that the resulting representations of the emotional valences are stronger (for negative and positive items) when they include the personal perspective. Stronger mismatch effects for the personal perspective when a positive emotion word follows a negative text account for a deeper engagement with negative emotions in text (even though the reading process was easier for positive emotions in combination with

the personal perspective). It might also be suggested that readers are more sensitive to mismatching information in negative contexts (in a negative mood), hence the personal experience of a negative situation followed by new and unexpected positive information in text leads to stronger mismatch effects.

Chapter 5 extends our findings in chapter 4 and investigates whether the mood of the reader affects the mental representations of emotions in text and whether readers engage more or less with perspective cues when their mood is congruent or incongruent with the emotions in the text. It was found, in line with chapter 4, that readers process texts faster from a personal perspective. The effect was more pronounced for participants in a positive mood. It can be assumed that readers are more sensitive to perspective cues when they are currently experiencing positive emotions themselves. However, participants in a negative mood were more sensitive to emotional inconsistencies as compared to participants in a positive mood. This was particularly true for negative items. It was suggested that readers in a positive mood try and maintain their positive mood state, and hence, they process positive information (congruent to their mood, even if inconsistent with the previous emotional valence) with greater ease. For participants in a negative mood, negatively valenced texts with negative endings are mood congruent and hence, easy to process. Positive information following a negative text is not only logically inconsistent, but also, it is incongruent to the negative mood state and hence, it is more difficult to integrate. The study highlights the importance of mood congruency (with the emotions in text) and it suggests that readers in a positive mood engage more strongly with text features such as perspective.

In chapter 6, one experiment was aimed at taking a closer look at the perspective effects found in chapter 3 and investigated whether effects originate at the personal pronoun (*you*, *he/she*) itself, and how readers process these pronouns in the context of

either negative or positive situations. Moreover, it was of interest whether perspective effects changed through the course of the text, i.e. whether readers engaged more with the personal perspective at the beginning or at the end of the text. To address these questions, an eye-tracking experiment was conducted, for which pronouns were set as interest areas. Fixation times for each pronoun were measured. It was found that readers fixated less on the personal pronoun *you* compared to *he/she* and that fixations on *you* were stable (similar) across pronoun regions. However, fixations on *he/she* decreased with the number of repetitions of the pronoun. This finding was more pronounced for negative texts. It was concluded that processing for personal pronoun *you* is easier as readers do not have to build up a mental representation about an unfamiliar character (see chapter 4). As they become more familiar with the character (as the text proceeds, with an increasing number of references back to its representation), processing of the pronouns *he/she* becomes easier and fixations become shorter. However, familiarity of the referent of *you* (to the readers themselves) does not change in the course of the text. The interaction of perspective and pronoun area was specific to negative texts. In line with previous studies outlined in this thesis, evidence was found suggesting that readers engage more with and build up stronger representations about negative situations in text (see chapter 4, experiment 4.2 and chapter 5). This finding was again evident in this study, with regard to characters referred to by *he/she*. Due to stronger empathic responses in readers for characters in negative situations, together with the familiarisation with the character over the course of the text, fixations on *he/she* decrease during the comprehension process. However, this finding was not evident for *you*. In a negative context, fixations slightly increased rather than decreased. This result could reflect the reluctance of readers (see chapter 4, experiment 4.1) to engage personally with a negative situation that unfolds over the course of the text.

The studies reported in this thesis gave evidence about the role of emotions during text (and sentence) processing. These findings are in line with previous research investigating mental representations, and how readers process and integrate new information into these representations. Also, these findings are relevant for research that is interested in how readers engage with the text, specifically with its emotional content, and how this engagement is affected by other factors such as mood and perspective.

7.2. Implications

7.2.1. Character Representations and Emotions

'The more emotional they feel the less command they have of language.' (Christie, 2010, p.247)

This thesis aimed to explore the role of emotional information on processing and on character representations. Characters experience different emotions in text. Readers include these emotional *characteristics* (Zwaan, 1999b) into their representations of the character. Emotions can change as a function of, for example, the characters' success or failure to achieve their goals (Zwaan, 1999b). Emotions are therefore linked to several dimensions (e.g., the protagonist and motivation indices in Zwaan's model) and also, they can help establish links between different parts of the text (i.e. explain behaviour and actions; Kneepkens & Zwaan, 1995).

As mentioned in chapter 1, previous research has found that readers track emotional information (Gygax et al., 2003; Gernsbacher et al., 1992), that emotional information captures the readers' attention and that readers keep emotional representations accessible and use emotional information to link different passages of the text even when neutral information interrupts passages with an emotional valence (de Vega et al., 1996). Also, previous research has established that more complex and richer

representations can facilitate processing (Hofmeister, 2011; Zwaan, 1999a). Combining the findings of research investigating effects of emotions on reading and research on effects of information load on processing (retrieval), it was predicted that emotional information in particular should cause mental representations to be more salient and easier to process. In chapter 2, the saliency of and processing benefits for representations that included emotional features were explored in a sentence processing experiment. The study built on research by Hofmeister (2011), who showed that more complex noun phrases, i.e. those with more associative information in the form of adjectives (e.g. *an optimistic English writer*) needed longer to be encoded, however, due to their richness and hence, to their uniqueness in memory (and as argued here to their saliency) these complex nouns also led to easier retrieval. The experiment reported in chapter 2 supported Hofmeister's findings (2011) for the noun, showing that more complex nouns led to longer encoding (reading) times. It was also found that when nouns were preceded by two adjectives, one of them emotional, these complexity effects could be found early i.e. directly at the head noun. This finding was not evident for non-emotionally qualified nouns. It was suggested that readers attend more to the emotional features and hence, they take longer to encode entities associated with emotional features compared to nouns with non-emotional qualifiers. Results were also in line with the ones reported by Hofmeister (2011) with regard to retrieval. However, it was found that retrieval was specifically facilitated when the noun was emotionally qualified (rather than non-emotionally). This result suggests a particular role of emotional information within mental representations causing them to be more salient and unique in memory. It also suggests that readers attend more to emotional information (due to its relevance during comprehension and for establishing coherence (e.g. Vega et al., 1996; Kneepkens & Zwaan, 1995; Graesser et

al., 1994) and that they are sensitive to the type of information that has to be included into the representation.

'One or more of those passengers killed Ratchett. Which of them?' (Christie, 2010, p.215)

In the following chapters presented within this thesis, effects of emotions on processing were tested in the framework of text rather than sentence comprehension. Also, another question that was raised in chapter 1 was whether and how reader track information about *multiple* characters, because as Oatley (1999) observed: *Most of our great writers encourage [...] identification with different characters ...* (p.446). The findings reported in this thesis gave clear evidence that readers are sensitive to emotional information in text and that they include emotional valence in their representation of characters (as shown by match/mismatch effects; Gyga et al., 2003; Gernsbacher et al., 1992). Second, it was found that emotionally elaborated characters are in focus of the reader i.e. that emotional information captures attention (Vega et al., 1996) and that readers try to arrive at a coherent representation of the text using emotional information (Kneepkens & Zwaan, 1995). Building up on previous studies, the experiments outlined in this thesis provide evidence that (negative) emotions in particular cause representations to be more salient. Also, the experiments in chapter 3, experiment 3.3 in particular, suggested that negatively qualified character representations were more salient (due to empathic engagement; Altmann et al., 2012; Keen, 2006), and that readers tried to link new information with the information about the (negatively) emotionally elaborated character, which shows that readers try to establish coherence in the text through the use of emotions (de Vega et al., 1996).

The findings so far highlighted the role of emotions for the salience of a single character representation. Very little research has explored how readers process

information that could be related to more than one character. The findings presented here show that readers are sensitive to the type of information (e.g. emotional) and that they try to link the same types of information to arrive at a coherent text representation. More salient characters (characters that share more pieces of information of the same type) are in focus of the reader and hence, readers try to link new information with their representations. Specifically, the findings of the experiments in chapter 2 and experiment 3.3 within this thesis give evidence that emotionally more elaborated characters (especially in a negative context) are more salient, which highlights the role of emotions during text comprehension and processing.

7.2.2. About you

'You know everything now [...]. What are you going to do about it? ...' (Christie, 2010, p.273)

Another question that was addressed in this thesis was how readers engage with (emotional) information in text from a personal point of view and how this personal engagement affects processing. As suggested by previous empirical studies (Brunyé et al., 2009; Brunyé et al., 2011) and by literary theorists (Schofield, 1998) readers engage with the text from a personal perspective, from the protagonist's point of view, when texts include the pronoun *you*. The experiments outlined in chapter 4 and the eye-tracking experiment presented in chapter 6 explored how readers process emotional texts when these texts address *you*.

The results of experiment 4.1 suggested that processing was faster for texts including the personal perspective, especially when texts described a positive emotion. It was suggested that reading is facilitated when readers do not have to build up a situation model that includes an *external* (Brunyé et al., 2009), less familiar character. Moreover, stronger perspective effects for positive texts gave evidence that readers are sensitive to

the emotions in text and that they have difficulties to build up a situation model of the text that includes negative information about themselves.

For Experiment 4.2 reading times were taken for the last sentence of the text which included an emotional match or mismatch. It was found that match/mismatch effects were stronger for the personal perspective, specifically for texts about a negative situation. This finding suggests that even though readers take longer to build up a representation of a negative text including *you* (compared to positive valences), they build up stronger, more salient representations when they engage more personally with the text and that this saliency is particularly strong for negative emotions. This result is in line with and can be explained by research findings proposing that negative emotions in text lead to stronger empathic engagement and a more active involvement of Theory of Mind (ToM) skills (Altmann et al., 2012; Brunyé et al., 2011; Keen, 2006). Chapter 4 extends research that investigated the use of the pronoun *you* and how it affects the way readers recall situations presented in text (Brunyé et al., 2009; Brunyé et al., 2011). Similar to previous research findings, the findings presented in this thesis suggest that the use of the pronoun *you* promotes stronger more personal engagement (from the protagonist's perspective) and furthers this research by showing that the personal perspective affects reading processes *during* comprehension as well as the construction and salience of situations models.

Chapter 6 used the eye-tracking method to investigate whether perspective effects change over the course of the text and whether they affect the way pronouns are processed directly. In line with the results found for reading times, readers processed texts including the pronoun *you* with greater ease (indicated by shorter fixation times; Rayner, 1977). Perspective effects changed from one pronoun region to the next (as the text proceeded). In line with the suggestion that readers process more familiar information with greater ease (Rayner 1977) fixations on the character referred to by *he/she* became shorter over

the course of the text. This finding was more pronounced for negative texts showing that emotional valence and the strength of engagement with emotions (claimed to be higher for negative texts, Altmann et al., 2012; Keen, 2006) affects eye-fixations at the pronoun. For the personal perspective (pronoun *you*), fixations for negative texts became longer as the text proceeded, which is in line with the notion that readers can still distance themselves from the text even when addressed personally (Kirby, 1992), as proposed by literary theorists. As the negative situation described in the text unfolds, readers become more reluctant to personally engage with it, and the distance between text and reader rather increased. Similar effects were found for early and late processing indicating that both encoding and integration processes were affected by perspective and text engagement.

7.2.3. About *your* mood

‘It depended, sir, on his mood’ (Christie, 2010, p.192)

Chapter 5 explored how the mood of the reader affects the way they process emotions and whether the congruency between readers’ mood and the characters emotions affects text engagement, perspective taking and mental representations. First, as proposed by other researchers, film clips were an effective tool to induce negative and positive mood states. Second, it was found that readers in a positive mood engaged more in perspective taking during reading (with stronger perspective effects and faster reading times for *you*). This result is in line with research suggesting that a positive mood causes readers to be more focused on relevant information and more sensitive to text features such as perspective (Chwilla, Virgillito & Vissers, 2011; Bohn-Gettler & Rapp, 2001). It also supports findings of previous studies which showed that individuals in a positive mood are more self-focused and hence, information about *you* is read faster than about

someone else (Herbert et al., 2008) whereas individuals in a negative mood state were found to be more objective.

A third finding of this study again highlighted that readers build up stronger representations in negative contexts (Altmann et al., 2012; Keen, 2006). Inconsistency effects were particularly strong for negative items, and in particular for participants in a negative mood. This result is in line with research highlighting congruency effects between mood and emotional valence of the text (Egidi & Nusbaum, 2012; Niedenthal, 2007). Participants in a negative mood were not able to integrate positive information that was inconsistent with the actual valence of the text. This positive information was not only incongruent with the information in text, but also with the reader's mood. However, for participants in a positive mood, inconsistent information in a negative context (i.e. positive information) was firstly congruent to their mood, and second, it fulfilled the mood bias i.e. the general preference towards positive information (Diener & Diener, 1996; Bower, 1981). Hence, the integration of (even inconsistent) positive information is facilitated. Mood effects were not evident for positive items, for which inconsistent information led to processing problems for both mood groups. It was suggested that participants in a negative mood are more objective and less affected by mood (in-)congruency but that they are more sensitive to inconsistencies within the text (Krahmer, Van Dorst & Ummelen, 2004). Again, findings are consistent with the notion of a general mood bias towards positive emotions, causing the integration of negative emotions to be more difficult for both groups (Diener & Diener, 1996; Bower, 1981).

In conclusion, the experiment outlined in chapter 5 found that mood of the reader affects perspective and engagement with text. Evidence was found that mood effects were dependent on whether readers' mood was congruent with the valence of the text (Egidi & Nusbaum, 2012; Niedenthal, 2007), on different comprehension strategies (so that readers

to focus on different information) between the mood groups (Chwilla, Virgillito & Vissers, 2011; Bohn-Gettler & Rapp, 2001), as well as on mood biases towards positive information (Diener & Diener, 1996; Bower, 1981).

7.3. Limitations and Future Directions

‘And now to return to the question you did not answer...’ (Christie, 2010, p.119)

This thesis has centred on the exploration of *emotional* information in text processing, discussing the impact of such information on the saliency and complexity of mental representations (chapters 2 and 3), as well as empathy and engagement (chapters 4, 5 and 6). However, looking beyond the current project, it would be interesting to employ the same methodologies to test other types of (non-emotional) information, identifying when and to what extent such information might give rise to similar responses in readers. Emotional information carries a particular resonance with readers, in part at least, because readers can relate to the emotional state described. When *Poirot* is *frustrated* because he cannot find the right clues to identify the murderer, readers can perceive his emotional state even if they find it difficult to imagine themselves in the same situation. They would also be able to think about other situations in which they felt the same emotion, helping them to understand actions and behaviour that follow the feeling of frustration, either in order to improve this emotional state (*Poirot* trying even harder to find clues), or consequential behaviour such as being sleepless. Hence, it was argued that emotions create a relationship between readers and characters. However, other information types might have the potential to establish a similar relationship. For example, sensory information (rather than emotional) can be similarly familiar and relatable for readers and hence similar effects to those reported in this thesis might be

expected. The potential here is to understand a spectrum of effects across different information types.

Engagement with the text, specifically engagement with emotions and perspective, was of interest in some of the studies reported within this thesis, and this is a particular area of study that I would like to follow up in future work. One main finding was that a more personal engagement with the text can lead to facilitated processing i.e. faster comprehension. It was demonstrated that the degree to which readers simulate and engage with the events and emotions in the text can be enhanced through the use of the personal pronoun *you* which addresses the reader directly. The use of the second person perspective functioned as a bridge between reader and protagonist that brought the reader closer to the story world and that of the protagonist. Future studies should take a closer look at other factors that can function as a similar bridge prompting the reader to experience the text from a more personal level. For example, participants could be addressed with their own names in the text rather than with *you*. The use of their name could cause participants to feel more familiar with the character or even to experience the text from an onlooker perspective overlooking themselves. Especially for children, there is the opportunity to personalise books by setting their own and their families' or friends' names into the story. If the use of the proper name would show similar effects to the personal perspective, then the use of these personalised books should be promoted as an aid for comprehension.

Alongside future directions, it is important to highlight areas of weakness or concern within the current project; how these were mitigated against, and how similar problems might be avoided in the future. Two areas of particular concern relate to the precise separation of emotional and non-emotional information, and the potential interference of each reader's personal circumstances and experiential background.

Some of the studies in this thesis aimed to show that emotional information causes representations to be more salient than representations with only non-emotional information. As outlined by Zwaan (1999) emotions are linked closely to the character dimension of his indexing model and are therefore not a separate dimension. In this thesis, it was argued that, in theory, emotions are a particular type of information that causes representations to be salient (see chapter 2 or experiment 3.3). It was found that emotionally more salient characters gain the focus of the reader and suggested the beneficial effect of emotions for processing. However, it must be noted that our studies included entities of a human nature (characters) which made the process of entirely avoiding emotional information or information that could be interpreted as emotional (make readers infer an emotional valence) difficult. Hence, in practice, comprehension processes between emotionally more and less elaborated characters were compared. Future research should try to mitigate this problem further by exploring alternative ways of comparing emotional and (as much as is possible) completely non-emotional character information, perhaps through the use of non-human characters. Such changes would, of course, raise their own concerns.

For experiments testing the effects of a personal engagement with text, passages needed to be more or less generic so that individuals would be able to identify with the situation. However, it has been appreciated that some readers might identify with a particular situation more easily than others, maybe because they have experienced a similar situation only recently, or sometimes they might not be able to identify with a situation due to missing shared experiences or preferences. For example, younger participants may not have experienced problems in the work-place. In order to address this further, future studies should do more to explore ways to measure personal engagement with text as a function of similarities between (experiences of) the character and (experiences of) the

reader. It should be investigated how these similarities affect the ability of readers to identify with the character and hence, whether they affect text processing.

As a final point, it should be noted that the experiments reported in this thesis presented texts that were specifically designed for experimental purposes. Some studies have used ‘more natural’ and also longer excerpts from published narratives (Cupchick, Oatley & Vorderer, 1998). It would be interesting to test differences between text engagement with these narratives, written by professional authors, and the results found here with our experimental passages.

7.4. Final Remarks

Let's not forget that the little emotions are the great captains of our lives and we obey them without realizing it. (van Gogh, 1889)

In this thesis, the relevance of emotions on processing was highlighted. An account was given of how emotions affect text processing, engagement and the salience of characters. Emotions arise in characters and in the reader, and they change during the reading process not only for the character but also for the reader. The interactions between the emotions of the reader, before, during and after reading, as well as the interactions between the changing emotions of characters and readers actively affect the way we as readers process, understand and enjoy narratives. Within this thesis some further steps were taken that help to untangle and understand the complex dynamics at play within this fascinating topic; a lot more research is required, of course, but it looks to be a ‘happy’ task.

‘Then, said Poirot, having placed my solution before you, I have the honour to retire from the case...’ (Christie, 2010, p.273)

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Appendix

List of Experimental Items

Experimental Items for Chapter 2

1. Bare: It was a writer that the dignitaries at the ceremony awarded with a medal in Stockholm.

Emotional: It was an optimistic (English) writer that the dignitaries at the ceremony awarded with a medal in Stockholm.

Non-emotional: It was a reclusive (English) writer that the dignitaries at the ceremony awarded with a medal in Stockholm.

2. Bare: It was a sculptor that the aristocrats at the gallery ridiculed during the exclusive art show.

Emotional: It was a moody (deaf) sculptor that the aristocrats at the gallery ridiculed during the exclusive art show.

Non-Emotional: It was a famous (deaf) sculptor that the aristocrats at the gallery ridiculed during the exclusive art show.

3. Bare: It was a sophomore that the pranksters at the fair frightened by setting off loud firecrackers.

Emotional: It was a melancholic (young) sophomore that the pranksters at the fair frightened by setting off loud firecrackers.

Non-Emotional: It was an unsuspecting (young) sophomore that the pranksters at the fair frightened by setting off loud firecrackers.

4. Bare: It was a mobster that the jurors in the trial imprisoned for thirty years without parole.

Emotional: It was a furious (Russian) mobster that the jurors in the trial imprisoned for thirty years without parole.

Non-Emotional: It was a dangerous (Russian) mobster that the jurors in the trial imprisoned for thirty years without parole.

5. Bare: It was a nurse that the surgeons in the hospital accused of poisoning the elderly man.

Emotional: It was a passionate (hospice) nurse that the surgeons in the hospital accused of poisoning the elderly man.

Non-Emotional: It was a clueless (hospice) nurse that the surgeons in the hospital accused of poisoning the elderly man.

6. Bare: It was a mercenary that the commanders at the base hired for the mission in Guatemala.

Emotional: It was a sulky (professional) mercenary that the commanders at the base hired for the mission in Guatemala.

Non-Emotional: It was a foreign (professional) mercenary that the commanders at the base hired for the mission in Guatemala.

7. Bare: It was a guard that the warden of the prison blamed for the escape attempt yesterday.

Emotional: It was a desolate (prison) guard that the warden of the prison blamed for the escape attempt yesterday.

Non-Emotional: It was an incompetent (prison) guard that the warden of the prison blamed for the escape attempt yesterday.

8. Bare: It was a Frenchman that the authorities in San Francisco identified as the smuggler of diamonds.

Emotional: It was an unperturbed (rich) Frenchman that the authorities in San Francisco identified as the smuggler of diamonds.

Non-Emotional: It was a notorious (rich) Frenchman that the authorities in San Francisco identified as the smuggler of diamonds.

9. Bare: It was a fisherman that the villagers on the beach saw on the stormy ocean seas.

Emotional: It was a bewildered (local) fisherman that the villagers on the beach saw on the stormy ocean seas.

Non-Emotional: It was a poor (local) fisherman that the villagers on the beach saw on the stormy ocean seas.

10. Bare: It was a rancher that the officials for the state subsidized throughout the worst drought periods.

Emotional: It was a lovesick (cattle) rancher that the officials for the state subsidized throughout the worst drought periods.

Non-Emotional: It was a Texas (cattle) rancher that the officials for the state subsidized throughout the worst drought periods.

11. Bare: It was a bureaucrat that the citizens of the county despised for always accepting illegal bribes.

Emotional: It was a jealous (government) bureaucrat that the citizens of the county despised for always accepting illegal bribes.

Non-Emotional: It was a crooked (government) bureaucrat that the citizens of the county despised for always accepting illegal bribes.

12. Bare: It was a communist that the members of the club banned from ever entering the premises.

Emotional: It was a miffed (Venezuelan) communist that the members of the club banned from ever entering the premises.

Non-Emotional: It was an alleged (Venezuelan) communist that the members of the club banned from ever entering the premises.

13. Bare: It was an entrepreneur that the investors in the company invited to the banquet on Thursday.

Emotional: It was a satisfied (marketing) entrepreneur that the investors in the company invited to the banquet on Thursday.

Non-Emotional: It was a successful (marketing) entrepreneur that the investors in the company invited to the banquet on Thursday.

14. Bare: It was an environmentalist that the activists for energy conservation congratulated for all the crucial accomplishments.

Emotional: It was a fearless (German) environmentalist that the activists for energy conservation congratulated for all the crucial accomplishments.

Non-Emotional: It was a young (German) environmentalist that the activists for energy conservation congratulated for all the crucial accomplishments.

15. Bare: It was a billionaire that the organizers of the campaign thanked for the largest ever contribution.

Emotional: It was an emotional (oil) billionaire that the organizers of the campaign thanked for the largest ever contribution.

Non-Emotional: It was an attractive (oil) billionaire that the organizers of the campaign thanked for the largest ever contribution.

16. Bare: It was a child that the neighbors from next door pulled from the burning apartment building.

Emotional: It was a horrified (crying) child that the neighbors from next door pulled from the burning apartment building.

Non-Emotional: It was a new-born (crying) child that the neighbors from next door pulled from the burning apartment building.

17. Bare: It was a dictator that the diplomats from neighboring countries advised to avoid another election process.

Emotional: It was a paralysed (military) dictator that the diplomats from neighboring countries advised to avoid another election process.

Non-Emotional: It was a self-possessed (military) dictator that the diplomats from neighboring countries advised to avoid another election process.

18. Bare: It was a soldier that the townspeople in the square rescued from the tank that was on fire.

Emotional: It was a startled (American) soldier that the townspeople in the square rescued from the tank that was on fire.

Non-Emotional: It was a wounded (American) soldier that the townspeople in the square rescued from the tank that was on fire.

19. Bare: It was a comedian that the audience in the bar heckled all the way through the routine.

Emotional: It was an embarrassed (stand-up) comedian that the audience in the bar heckled all the way through the routine.

Non-Emotional: It was a hilarious (stand-up) comedian that the audience in the bar heckled all the way through the routine.

20. Bare: It was a monk that the protestors at the rally supported in the quest for Tibetan freedom.

Emotional: It was a delighted (Buddhist) monk that the protestors at the rally supported in the quest for Tibetan freedom.

Non-Emotional: It was a quiet (Buddhist) monk that the protestors at the rally supported in the quest for Tibetan freedom.

21. Bare: It was a general that the committee on foreign relations questioned for over two hours yesterday.

Emotional: It was a devoted (four-star) general that the committee on foreign relations questioned for over two hours yesterday.

Non-Emotional: It was a victorious (four-star) general that the committee on foreign relations questioned for over two hours yesterday.

22. Bare: It was a musician that the fans at the club booed for forgetting the lyrics to the songs.

Emotional: It was an inexperienced (rock) musician that the fans at the club booed for forgetting the lyrics to the songs.

Non-Emotional: It was a nervous (rock) musician that the fans at the club booed for forgetting the lyrics to the songs.

23. Bare: It was an explorer that the crew of the ship resented for taking them closer to the ice cap.

Emotional: It was a fascinated (ocean) explorer that the crew of the ship resented for taking them closer to the ice cap.

Non-Emotional: It was a foolish (ocean) explorer that the crew of the ship resented for taking them closer to the ice cap.

24. Bare: It was a programmer that the executives at the firm chose to lead the design team for their website.

Emotional: It was a mournful (computer) programmer that the executives at the firm chose to lead the design team for their website.

Non-Emotional: It was a nerdy (computer) programmer that the executives at the firm chose to lead the design team for their website.

Experimental Items for Chapter 3

1. In the Law Department, Professor Smith is preparing for his first lecture. He just started the position a few weeks ago and hasn't had much time to get used to the new environment. He has never stood in front of a crowd like this. Over 300 students will stare at him for nearly an hour. He was not able to eat anything this morning and the nausea is just getting worse. Next door, Professor Lane is writing an article. Both Professor Lane and Professor Smith graduated in London.

Nervously / Excitedly,

Professor Lane/ Professor Smith locks the door of the office.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

In the Law Department, Professor Smith is preparing for his first lecture. He just started the position a few weeks ago and hasn't had much time to get used to the new environment. He has never stood in front of a crowd like this. Over 300 students will stare at him for nearly an hour. He was not able to eat anything this morning and the nausea is just getting worse. Next door, Professor Lane discovers that his grant money has just been transferred, so he can start the big project. Both Professor Lane and Professor Smith graduated in London.

Nervously/Excitedly

Professor Lane/Professor Smith locks the door of the office.

In the Law Department, Professor Smith is preparing for his first lecture. He just started the position a few weeks ago and hasn't had much time to get used to the new environment. He has never stood in front of a crowd like this. Over 300 students will stare at him for nearly an hour. He was not able to eat anything this morning and the nausea is just getting worse. Next door, Professor Lane feels similarly uncomfortable as he is expecting bad news about the sales of his first book. Both Professor Lane and Professor Smith graduated in London.

Nervously/Excitedly

Professor Lane/Professor Smith locks the door of the office.

Neutral Character (Experiment 3.3)

In the Law Department, Professor Smith is preparing for his first lecture. He just started the position a few weeks ago but he has had some time to get used to the new environment. He knows how it is to stand in front of a crowd like this before. A lot of students will be listening to him for almost an hour. He has had some lunch and is getting ready for his lecture.

Next door, Professor Lane is writing an article. Both Professor Lane and Professor Smith graduated in London.

With a full stomach/ With an empty stomach

Professor Lane/ Professor Smith locks the door of the office.

2. During the holidays, Sarah and her family were spending the day at an adventure park. The trip was a big surprise for her. She knew about this park before and always wanted to go on the big rollercoaster. She jumped excitedly up and down. Julia has been to the park before. Julia's and Sarah's parents used to be neighbours.

Full of enthusiasm / fear

Sarah/Julia joined the queue for the rollercoaster.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

During the holidays, Sarah and her family are spending the day in an adventure park. The trip was a big surprise for her. She knew about this park before and always wanted to go on the big rollercoaster. She jumps excitedly up and down. Julia gets nauseous just thinking about a big rollercoaster. Julia's and Sarah's parents have been friends for years.

Full of enthusiasm / fear

Sarah/Julia joined the queue for the rollercoaster.

During the holidays, Sarah and her family are spending the day in an adventure park. The trip was a big surprise for her. She knew about this park before and always wanted to go on the big rollercoaster. She jumps excitedly up and down. Julia's eyes light up just thinking about the rollercoaster. Julia's and Sarah's parents have been friends for years.

Full of enthusiasm / fear

Sarah/Julia joined the queue for the rollercoaster.

Neutral Character (Experiment 3.3)

During the holidays, Sarah and her family were spending the day at an adventure park. The trip was not a surprise for her. She knew about this park before and heard about the big rollercoaster. She was watching people standing in the queue.

Julia has been to the park before. Julia and Sarah's parents used to be neighbours.

Together with her parents/friends,

Sarah/Julia joined the queue for the rollercoaster.

3. John could not believe that the referee disallowed his goal. Everything had been perfect. When he was passed the ball he reacted quickly and just shot. The crowd was cheering when the ball flew into the net. The decision of the referee hit him hard. Martin also plays football. John and Martin had done their training together.

Bitterly / joyfully

John/Martin returned to the changing room.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

John could not believe that the referee disallowed his goal. Everything had been perfect. When he was passed the ball he reacted quickly and just shot. The crowd was cheering when the ball flew into the net. The decision of the referee hit him hard. Martin was on the other team and celebrated the referee's decision. John and Martin often played in the same position.

Bitterly / joyfully

John/Martin returned to the changing room.

John could not believe that the referee disallowed his goal. Everything had been perfect. When he was passed the ball he reacted quickly and just shot. The crowd was cheering when the ball flew into the net. The decision of the referee hit him hard. Martin is on the same team and has to bite his tongue to stop himself shouting at the referee. John and Martin often played in the same position.

Bitterly / joyfully

John/Martin returned to the changing room.

Neutral Character (Experiment 3.3)

As today's referee, John decided to disallow the goal. Everything was clear. Before the ball flew in the goal, he knew what the decision had to be. He did not mind the big crowd around him. He was an experienced referee. Martin was refereeing at a different stadium. John and Martin had done their training together.

Gazing around the empty/ full stadium,

John/Martin took a sip of his water.

4. At the hospital, Linda just received her results concerning her surgery. She had been waiting all morning and assumed the worst. However, the doctor came in with a smile and congratulated her. The tension of the previous hours was blown away immediately. Tanya has been a nurse for a year. Linda and Tanya got to know each other in the hospital.

It was clearly visible how relived/upset

Linda/Tanya was when she called her relatives.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

At the hospital, Linda just received her results concerning her surgery. She had been waiting all morning and assumed the worst. However, the doctor came in with a smile and congratulated her. The tension of the previous hours was blown away immediately. Tanya hoped she could go home, but she has been told she needs another operation.

Linda and Tanya got to know each other in the hospital.

It was clearly visible how relived/upset

Linda/Tanya was when she called her relatives.

At the hospital, Linda just received her results concerning her surgery. She had been waiting all morning and assumed the worst. However, the doctor came in with a smile and congratulated her. The tension of the previous hours was blown away immediately. Tanya has also received good news and can leave the hospital. Linda and Tanya got to know each other in the hospital.

It was clearly visible how relived/upset

Linda/Tanya was when she called her relatives.

Neutral Character (Experiment 3.3)

At the hospital, Linda just received the summary of her test results. She was tested in the morning and knew this outcome was likely. However, the doctor wanted her to wait for the official report. She had to wait for hours in the waiting room.

Tanya has been a nurse for a year. Linda and Tanya got to know each other in the hospital.

After the long wait/ her break,

Linda/Tanya made a call.

5. Sally has been saving for a house deposit for over 5 years. She has denied herself many things, but is still struggling to save enough. Some of her friends have been

bought houses by their parents, and they didn't understand why she was taking so long. She wished that her own parents had money to lend her. Mary has been working in the local shop. Mary and Sally have been friends for years.

Feeling jealous/content,

Sally/Mary decided to spend some time on her own.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Sally has been saving for a house deposit for over 5 years. She has denied herself many things, but is still struggling to save enough. Some of her friends have been bought houses by their parents, and they don't understand why she is taking so long. She wishes that her own parents had money to lend her. Mary smiles, looking at the pictures of her own new house. Mary and Sally have been friends for years.

Feeling jealous/content,

Sally/Mary decided to spend some time on her own.

Sally has been saving for a house deposit for over 5 years. She has denied herself many things, but is still struggling to save enough. Some of her friends have been bought houses by their parents, and they don't understand why she is taking so long. She wishes that her own parents had money to lend her. Mary has also had to save up for years whilst watching others move into their dream houses. Mary and Sally have been friends for years.

Feeling jealous/content,

Sally/Mary decided to spend some time on her own.

Neutral Character (Experiment 3.3)

Sally has been saving up for a deposit on a house for over 5 years. She tried not to spend money on unnecessary things, so she could save enough. Some of her friends have bought houses, and she was trying to do the same. She wondered whether her parents had money to lend her. Mary has been working in the local shop. Mary and Sally have been friends for years.

Having bought groceries/a new handbag

Sally/Mary decided to spend some time on her own.

6. When Nick saw his parents waving from the crowd the day could not have become any more perfect. He was standing in the queue to finally receive his certificate for which he had been working so hard. His friends and family were all around him, and he knew his professors were pleased about his success. Alex was in his first year at university. Alex and Nick had taken a class together.

Full of pride/ shame

Nick/Alex went to his seat.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

When Nick saw his parents waving from the crowd the day could not have become any more perfect. He was standing in the queue to finally receive his certificate for which he had been working so hard. His friends and family were all around him, and he knew his professors were pleased about his success. Alex has to continue studying as he has failed multiple courses. Alex and Nick had taken a class together.

Full of pride/ shame

Nick/Alex went to his seat.

When Nick saw his parents waving from the crowd the day could not have become any more perfect. He was standing in the queue to finally receive his certificate for which he had been working so hard. His friends and family were all around him, and he knew his professors were pleased about his success. Alex also heads to the podium, waving to his family as he goes. Alex and Nick had taken a class together.

Full of pride/ shame

Nick/Alex went to his seat.

Neutral Character (Experiment 3.3)

Nick saw his parents in the crowd on the day of his graduation. He was standing in the queue to receive his certificate for his 3 year program. He searched for his family and friends and spotted some of his professors in the audience.

Alex was in his first year at university. Alex and Nick had taken a class together.

Walking into the hall/classroom,

Nick/Alex went to his seat.

7. Paul decided to throw a big party to celebrate his 30th birthday. He invited all his friends and family, and was excited at the prospect of seeing them all together. He spent all of last night cooking and preparing for the party. Unfortunately, even after 2 hours of waiting, nobody had shown up. Jack went to a charity event on Sunday. Paul and Jack met briefly in the supermarket while buying goods for the weekend.

A sense of disappointment/excitement filled

Paul/Jack looking back on the day.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Paul decided to throw a big party to celebrate his 30th birthday. He invited all his friends and family, and was excited at the prospect of seeing them all together. He spent all of last night cooking and preparing for the party. Unfortunately, even after 2 hours of waiting, nobody has shown up. Jack's birthday party, held across the street, was a big success. Paul and Jack met briefly in the supermarket while buying goods for the weekend.

A sense of disappointment/excitement filled

Paul/Jack looking back on the day.

Paul decided to throw a big party to celebrate his 30th birthday. He invited all his friends and family, and was excited at the prospect of seeing them all together. He spent all of last night cooking and preparing for the party. Unfortunately, even after 2 hours of waiting, nobody has shown up. Jack had also planned a party, but had to cancel it as everyone sent their excuses. Paul and Jack met briefly in the supermarket while buying goods for the weekend.

A sense of disappointment/excitement filled

Paul/Jack looking back on the day.

Neutral Character (Experiment 3.3)

Paul decided to throw a party for his 30th birthday. He invited all of his friends and family, to bring them all together. He spent last night cooking and preparing for the

party. After 2 hours of talking, some of his guests started to dance. Jack hosted a charity event on Sunday. Paul and Jack met briefly in the supermarket while buying goods for the weekend.

After looking at his birthday presents/ catering bill

Paul/Jack cleaned up some glasses.

8. Today marked 10 years work at the advertising agency for Sophie. She was not sure whether her colleagues would remember this anniversary, but it meant a lot to her. She liked the agency, and it was her first job after graduation. On arrival at work, she was greeted by a group of her colleagues with a cake and balloons. Emma has just started work at the advertising agency. Sophie and Emma have been sharing an office.

Sitting at the desk with a sense of joy/ melancholy,

Sophie/Emma went through the post.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Today marks 10 years work at the advertising agency for Sophie. She was not sure whether her colleagues would remember, but it means a lot to her. She likes the agency, and it was her first job after graduation. On arrival, she was greeted by a group of her colleagues with a cake and balloons. Emma has just started work at the advertising agency and is missing her old job. Sophie and Emma share an office.

Sitting at the desk with a sense of joy/ melancholy,

Sophie/Emma went through the post.

Today marks 10 years work at the advertising agency for Sophie. She was not sure whether her colleagues would remember, but it means a lot to her. She likes the agency, and it was her first job after graduation. On arrival, she was greeted by a group of her colleagues with a cake and balloons. Emma has just started work at the advertising agency and everyone been lovely to her right away. Sophie and Emma share an office.

Sitting at the desk with a sense of joy/ melancholy,

Sophie/Emma went through the post.

Neutral Character (Experiment 3.3)

Today marked 10 years in which Sophie has worked for the advertising agency. She thought about some of her tasks, as she walked to her office. She knew the agency, and it was her first job after graduation. During lunch, a group of colleagues asked whether she could remember her first day. Emma has just started work at the advertising agency. Sophie and Emma have been sharing an office.

After the lunch/the workshop

Sophie/Emma went through the post.

9. Lily has made plans to spend her day at the seaside. She has not had a day off work in weeks, and has been looking forward to this for a long time. At the last minute, she noticed that her rota has changed and she has to work in the afternoon. Jane has plans to go to the cinema. Jane and Lily often take the same bus to work.

Disappointed/ Cheerful,

Lilly/Jane poured herself a drink.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Lily has made plans to spend her day at the seaside. She has not had a day off work in weeks, and has been looking forward to this for a long time. At the last minute, she notices that her rota has changed and she has to work in the afternoon. Jane is at the beach meeting friends she hasn't seen for a long time. Jane and Lily often take the same bus to work.

Disappointed/ Cheerful,
Lilly/Jane poured herself a drink.

Lily has made plans to spend her day at the seaside. She has not had a day off work in weeks, and has been looking forward to this for a long time. At the last minute, she notices that her rota has changed and she has to work in the afternoon. Jane's date has just called and cancelled their dinner. Jane and Lily often take the same bus to work.

Disappointed/ Cheerful,
Lilly/Jane poured herself a drink.

Neutral Character (Experiment 3.3)

Lilly has made plans to meet an old friend and go to the seaside. She has a day off work, and has been planning the trip for a long time. At the last minute, her mother called and wanted to chat. This has happened several times before. As she had to go, she made an excuse and left the house.

Jane has plans to go to the cinema later this evening. Jane and Lilly often take the same bus to work

In a rush/ with plenty of time,
Lilly/Jane set off.

10. Tom likes his food. Nothing made him happier than going to his local pub on a warm day, ordering a big meal and a pint of ale, and watching the day go by. Arriving at the pub early, he met a group of his friends, and they settled down for the meal together. For Luke it was a working day. Luke and Tom often play darts together.

After the big meal, satisfied/ unhappy,
Tom/Luke took a short nap.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Tom likes his food. Nothing makes him happier than going to his local pub on a warm day, ordering a big meal and a pint of ale, and watching the day go by. Arriving at the pub early, he meets a group of his friends, and they settle down for the meal together. Luke has lunch with business partners and learns that he will not be able to close the deal. Luke and Tom often play darts together.

After the big meal, satisfied/ unhappy,
Tom/Luke took a short nap.

Tom likes his food. Nothing makes him happier than going to his local pub on a warm day, ordering a big meal and a pint of ale, and watching the day go by. Arriving at the pub early, he meets a group of his friends, and they settle down for the meal together. Luke also sits in the bar, eating his favourite meal. Luke and Tom often play darts together.

After the big meal, satisfied/ unhappy,

Tom/Luke took a short nap.

Neutral Character (Experiment 3.3)

Tom likes his food. Every Wednesday and especially in summer, he goes to his local pub and orders a big meal and a pint of ale, and lets the day go by. Arriving at the pub early, he met a group of locals, and they settled down for a meal together. For Luke it was a working day. Luke and Tom often play darts together.

After the meal/ meeting,

Tom/Luke took a short nap.

11. Matthew returned home to find that vandals had broken in. There was spray paint across several of his walls, and his furniture has been damaged. He had been very proud of his house, having spent the last two years renovating it and decorating. He clenched his fists as he looked around the house and wondered who would have the nerve to do this to him. Across the street, James was hanging a picture. Matthew and James had both been informed about previous vandalisms.

Feeling hateful/good,

Matthew/James wondered who could have done this.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Matthew returns home to find that vandals have broken in. There is spray paint across several of his walls, and his furniture has been damaged. He had been very proud of his house, having spent the last two years renovating it and decorating. He clenches his fists as he looks around the house and wonders who would have the nerve to do this to him. Next door, James admires the look of his newly decorated living room. Matthew and James have been renovating their houses at the same time.

Feeling hateful/good,

Matthew/James wondered who could have done this.

Matthew returns home to find that vandals have broken in. There is spray paint across several of his walls, and his furniture has been damaged. He had been very proud of his house, having spent the last two years renovating it and decorating. He clenches his fists as he looks around the house and wonders who would have the nerve to do this to him. Next door, James calls the police after he discovered that he has been burgled as well. Matthew and James have been renovating their houses at the same time.

Feeling hateful/good,

Matthew/James wondered who could have done this.

Neutral Character (Experiment 3.3)

Matthew inspected a house where vandals had broken in. There was spray paint across several walls, and the old furniture had been damaged. He had seen scenes like this before, having worked the last two years for the local police. He put on his gloves, looked around the house, and wondered who from his team would come to assist him. Across the street, James was hanging a picture. Matthew and James have both been informed about previous vandalisms.

Looking at the graffiti/ artwork,

Matthew/James wondered who could have done this.

12. With a smile on her face Maya spread rose petals onto the table. For Valentine's Day she has always spoiled her husband in this way and it has become a tradition. They have been married for 3 years now, they have a baby on the way, and they could not be happier. She is looking forward to many more years with him at her side. Elizabeth did her shopping. Maya and Elizabeth knew each other from the local swimming club.

Overcome with love/ disgust,

Maya/Elizabeth has changed her view about Valentine's day.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

With a smile on her face Maya spreads rose petals onto the table. For Valentines Day she always spoils her husband in this way and it has become a tradition. They have been married for 3 years now, they have a baby on the way, and they could not be happier. She looks forward to many more years with him at her side. Elizabeth returns from a date with one of the most sleazy guys she has ever met. Maya and Elizabeth know each other from the local swimming club.

Overcome with love/ disgust,

Maya/Elizabeth has changed her view about Valentine's day.

With a smile on her face Maya spreads rose petals onto the table. For Valentines Day she always spoils her husband in this way and it has become a tradition. They have been married for 3 years now, they have a baby on the way, and they could not be happier. She looks forward to many more years with him at her side. Elizabeth is on honeymoon after the most wonderful wedding. Maya and Elizabeth know each other from the local swimming club.

Overcome with love/ disgust,

Maya/Elizabeth has changed her view about Valentine's day.

Neutral Character (Experiment 3.3)

Maya spread rose petals on the hotel bed. She has been doing this every year for her guests on Valentine's Day, and it has become a tradition. She has been married for 3 years now herself, and they got to know each other at the hotel, which they bought a few years later. She looked around the room, and decided it was finished. She had 5 rooms left to prepare.

Elizabeth did her shopping. Maya and Elizabeth knew each other from the local swimming club.

Being married/ single,

Maya/Elizabeth has changed her view about Valentine's day.

13. Natalie invested all of her money into setting up a new restaurant. It has been her dream to do so since she was a child, and it had started well. However, following some bad reviews, the restaurant had not been full in weeks. The bills were mounting up, the peak season was over, and it became clear that the restaurant had to close. Lucy owned a restaurant in town. Lucy and Natalie have often shared waiting staff between the two restaurants.

The post arrived and hopelessly/ happily

Natalie/Lucy looked at the accounts.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Natalie has invested all of her money into setting up a new restaurant. It has been her dream to do so since she was a child, and it had started well. However, following some bad reviews, the restaurant has not been full in weeks. The bills are mounting up, the peak season is over, and it has become clear that the restaurant will have to close. Lucy owns a restaurant in town that has just received a Michelin star. Lucy and Natalie have often shared waiting staff between the two restaurants.

The post arrived and hopelessly/ happily
Natalie/Lucy looked at the accounts.

Natalie has invested all of her money into setting up a new restaurant. It has been her dream to do so since she was a child, and it had started well. However, following some bad reviews, the restaurant has not been full in weeks. The bills are mounting up, the peak season is over, and it has become clear that the restaurant will have to close. Lucy owns a restaurant in town, but she too will have to shut down next month. Lucy and Natalie have often shared waiting staff between the two restaurants.

The post arrived and hopelessly/ happily
Natalie/Lucy looked at the accounts.

Neutral Character (Experiment 3.3)

Natalie invested all of her money into setting up a new restaurant. She had been working as a manager before, but being the owner is new to her. She was thinking about the reviews left by the first guests after their visit. Bills would have to be paid after the shift was over, and she should not forget the bins when the restaurant was closed.

Lucy owns a restaurant in town. Lucy and Natalie have often shared waiting staff between the two restaurants.

As part of her new/ old routine
Natalie/Lucy looked at the accounts.

14. The day of the test had finally arrived and Ryan felt ready. He had been driving his dad's car for the last few weeks, he had completed his driving lessons, and everyone thought he would breeze through the test. Usually he would have been more worried about a test, but he knew he had the competence to pass without a problem. Charles was picking up his friends. Charles and Ryan often talked about cars together.

Opening the car door confidently/nervously,
Ryan/Charles was held up in traffic.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

The day of the test has finally arrived and Ryan feels ready. He has been driving his dad's car for the last few weeks, he has completed his driving lessons, and everyone thinks he will breeze through the test. Usually he would be more worried about a test, but he knows he has the competence to pass without a problem. Charles has failed two tests already and has the third one today. Charles and Ryan often talk about cars together.

Opening the car door confidently/nervously,
Ryan/Charles was held up in traffic.

The day of the test has finally arrived and Ryan feels ready. He has been driving his dad's car for the last few weeks, he has completed his driving lessons, and everyone thinks he will breeze through the test. Usually he would be more worried about a test, but he knows he has the competence to pass without a problem. Charles has been racing cars for years, and hasn't lost a race yet. Charles and Ryan often talk about cars together.

Opening the car door confidently/nervously,
Ryan/Charles was held up in traffic.

Neutral Character (Experiment 3.3)

The day of the test had arrived and Ryan was getting ready. He had been driving his dad's car for the last few weeks, he had completed his driving lessons, and everyone wished him good luck for the test. Usually he would be in school now, but instead he has had to take the bus to the test centre.

Charles was picking up his friends. Charles and Ryan often talked about cars together. On the way to the test/school,
Ryan/Charles was held up in traffic.

15. Andrew and his wife had their first child last year. The child was born safely, but it soon became clear that there was something wrong. About six months ago the baby was diagnosed with a terminal illness, and yesterday it passed away. Andrew and his wife have not stopped crying. Gavin has just started working at the university. Andrew and Gavin were friends when they were younger, but have lost touch.

Distraught/elated,
Andrew/Gavin considered the day ahead.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Andrew and his wife had their first child last year. The child was born safely, but it soon became clear that there was something wrong. About six months ago the baby was diagnosed with a terminal illness, and yesterday it passed away. Andrew and his wife have not stopped crying. Gavin is holding his healthy new-born daughter. Andrew and Gavin were friends when they were younger, but have lost touch.

Distraught/elated,
Andrew/Gavin considered the day ahead.

Andrew and his wife had their first child last year. The child was born safely, but it soon became clear that there was something wrong. About six months ago the baby was diagnosed with a terminal illness, and yesterday it passed away. Andrew and his wife have not stopped crying. Gavin also lost a child a few weeks ago. Andrew and Gavin were friends when they were younger, but have lost touch.

Distraught/elated,
Andrew/Gavin considered the day ahead.

Neutral Character (Experiment 3.3)

Andrew and his wife had their first child last year. The birth went fine, and they were able to go home soon afterwards. After six months it was clear that the flat was too small for a baby, and yesterday they finally moved. Andrew and his wife have not stopped unpacking.

Gavin has just started working at the university. Andrew and Gavin were friends when they were younger, but have lost touch.
Going for a walk with his baby/children,
Andrew/Gavin considered the day ahead.

16. With the wedding day approaching, Leah had everything planned. She had been concerned about the weather, but all the latest reports had promised fine sunshine throughout the day. Even better, it looked as though a number of her friends who were unsure if they could make it would also be able to come. Nora looked into her wardrobe. Leah and Nora were going to the gym together.
Feeling optimistic/pessimistic
Leah/Nora wanted to look amazing.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

With the wedding day approaching, Leah has everything planned. She had been concerned about the weather, but all the latest reports have promised fine sunshine throughout the day. Even better, it looks as though a number of her friends that were unsure if they could make it will also be able to come. Nora was hoping for rainy weather, as she wants to avoid having to work in the garden. Leah and Nora go to the same gym.
Feeling optimistic/pessimistic
Leah/Nora wanted to look amazing.

With the wedding day approaching, Leah has everything planned. She had been concerned about the weather, but all the latest reports have promised fine sunshine throughout the day. Even better, it looks as though a number of her friends that were unsure if they could make it will also be able to come. After the good weather reports, Nora is looking forward to a day at the beach. Leah and Nora go to the same gym.
Feeling optimistic/pessimistic
Leah/Nora wanted to look amazing.

Neutral Character (Experiment 3.3)

With the wedding day approaching, Leah had everything planned. She had been concerned about the weather, but all the latest reports had promised that it would be stable throughout the day. She wondered whether a number of her friends, who were unsure if they could make it, would be able to attend.
Nora looked into her wardrobe. Leah and Nora were going to the gym together.
As the bride/ a guest,
Leah/Nora wanted to look amazing.

17. Grace bought her dog 18 years ago. It has been a faithful friend and companion through good times and bad, but a week ago the dog died. As she lived on her own in a big house, the dog had been especially important and comforting. In fact, their daily walks together had often been the only reason she had maintained contact with others in the town. Camilla was living across town. Camilla and Grace shared an interest in cooking.
To feel less lonely/ joyful,
Grace/Camilla went for a walk.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Grace bought her dog 18 years ago. It has been a faithful friend and companion through good times and bad, but a week ago the dog died. Living on her own in a big house, the dog has been especially important and comforting. In fact, their daily walks together have often been the only reason she has maintained contact with others in the town. Camilla just got elected as Mayor of the town. Camilla and Grace share an interest in theatre.

To feel less lonely/ joyful,
Grace/Camilla went for a walk.

Grace bought her dog 18 years ago. It has been a faithful friend and companion through good times and bad, but a week ago the dog died. Living on her own in a big house, the dog has been especially important and comforting. In fact, their daily walks together have often been the only reason she has maintained contact with others in the town. Camilla has moved to a new town and still doesn't know anyone. Camilla and Grace share an interest in theatre.

To feel less lonely/ joyful,
Grace/Camilla went for a walk.

Neutral Character (Experiment 3.3)

Grace bought her dog 18 years ago. It has been a faithful friend and companion through good times and bad. A week ago she bought another one. As she lived on her own in a big house, the dog had been especially important and entertaining. In fact, their daily walks together had often been the only reason she had maintained contact with others in the town.

Camilla was living across town. Camilla and Grace shared an interest in cooking.
To get out of her house/ flat,
Grace/Camilla went for a walk.

18. Jamie woke up early to try and catch a glimpse of Father Christmas. Although he failed in this, he was immediately struck by the pile of gifts at the end of his bed. He jumped out of bed, and began ripping off the wrapping paper. Everything he wanted was there and he began to do a dance in celebration. Daniel woke up late. Although they were in the same year at school Daniel and Jamie were not friends.

Overcome with giddiness/ sadness,
Jamie/Daniel had to have a lie down.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Jamie woke up early to try and catch a glimpse of Father Christmas. Although he failed in this, he was immediately struck by the pile of gifts at the end of his bed. He jumped out of bed, and began ripping off the wrapping paper. Everything he wanted was there and he began to do a dance in celebration. Daniel woke up late and found no presents. Although they are in the same year at school, Daniel and Jamie are not friends.

Overcome with giddiness/ sadness,
Jamie/Daniel had to have a lie down.

Jamie woke up early to try and catch a glimpse of Father Christmas. Although he failed in this, he was immediately struck by the pile of gifts at the end of his bed. He jumped

out of bed, and began ripping off the wrapping paper. Everything he wanted was there and he began to do a dance in celebration. Daniel woke up early and heard a noise that could only mean that Santa was in the house! Although they are in the same year at school, Daniel and Jamie are not friends.

Overcome with giddiness/ sadness,
Jamie/Daniel had to have a lie down

Neutral Character (Experiment 3.3)

Jamie woke up early to try and catch a glimpse of Father Christmas. Although he failed in this, he was immediately distracted by his teddy at the end of the bed. He jumped out of bed, and began playing with it. He wanted a new toy car for Christmas, and he began to wonder whether the teddy could drive it.

Daniel woke up late. Although they were in the same year at school, Daniel and Jamie were not friends.

After playing with his teddy/space ship
Jamie/Daniel had to have a lie down.

19. David had been on holiday from school for five of the six weeks. The first two weeks were really fun, with lots of activities and great weather. However, for the last three weeks the weather had been bad, most of his friends were away, and his parents had run out of ideas for things he could do. He was sitting in his room and staring at the wall. Tyler was on holiday with his parents. David and Tyler were classmates in year seven at school.

Looking up at his parents, bored/thrilled,
David/Tyler asked if anything was planned.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

David has been on holiday from school for five of the six weeks. The first two weeks were really fun, with lots of activities and great weather. However, for the last three weeks the weather has been bad, most of his friends are away, and his parents have run out of ideas for things he can do. He sits in his room and stares at the wall. Tyler is going on a Safari tour and is just about to board the plane. David and Tyler are classmates in year seven at school.

Looking up at his parents, bored/thrilled,
David/Tyler asked if anything was planned.

David has been on holiday from school for five of the six weeks. The first two weeks were really fun, with lots of activities and great weather. However, for the last three weeks the weather has been bad, most of his friends are away, and his parents have run out of ideas for things he can do. He sits in his room and stares at the wall. Tyler has to spend his holidays lying on the sofa as he has broken his leg. David and Tyler are classmates in year seven at school.

Looking up at his parents, bored/thrilled,
David/Tyler asked if anything was planned.

Neutral Character (Experiment 3.3)

David had been on holiday from school for five out of six weeks. The first two weeks were good, with a few activities outside and nice weather. However, for the last three

weeks the weather had been not as great. He has played inside with his friends, and his parents have arranged game evenings to entertain him. He was sitting in the living room and set up a new round of monopoly.

Tyler was on holiday with his parents. David and Tyler were classmates in year seven of school.

Having finished setting up the game/laptop,

David/Tyler asked if anything was planned.

20. Lauren had taken many years to conceive a child, and finally did so last year. Today is her first Mother's Day as a parent, and she has been looking forward to it. She didn't expect anything too much, but was surprised by her partner with breakfast in bed and a card showing a picture of the family together. She held the card tightly with a big smile on her face. Alice finished her Sunday lunch. Lauren and Alice were going to the same hairdresser.

Touched/ annoyed by the events of the day,

Lauren/Alice looked at her baby.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Lauren had taken many years to conceive a child, and finally did so last year. Today is her first Mother's Day as a parent, and she has been looking forward to it. She didn't expect anything too much, but was surprised by her partner with breakfast in bed and a card showing a picture of the family together. She held the card tightly with a big smile on her face. Alice has hoped for a nice gesture on Mother's Day from her partner, but just like last year, he has forgotten. Lauren and Alice go to the same hairdresser.

Touched/ annoyed by the events of the day,

Lauren/Alice looked at her baby.

Lauren had taken many years to conceive a child, and finally did so last year. Today is her first Mother's Day as a parent, and she has been looking forward to it. She didn't expect anything too much, but was surprised by her partner with breakfast in bed and a card showing a picture of the family together. She held the card tightly with a big smile on her face. Alice was also surprised, receiving her favourite cake prepared by her husband and her small daughter. Lauren and Alice go to the same hairdresser.

Touched/ annoyed by the events of the day,

Lauren/Alice looked at her baby.

Neutral Character (Experiment 3.3)

Lauren had taken many years to conceive a child, and finally did so last year. Today is her first Mother's Day as a parent, and she had to wake up early. She planned on going to the bakery to have a nice breakfast with her partner before visiting her own mother and the family. She also remembered that she still has to write the card for her mother. Alice finished her Sunday lunch. Lauren and Alice were going to the same hairdresser.

On the way to her mother / father,

Lauren/Alice looked at her baby.

21. Isabel and her family were at the beach. She has spent the entire day making the most amazing sandcastle she has ever made, and was very proud of it. But about 10 minutes ago, when she was relaxing after a job well done, her brother decided to jump

on top of the sandcastle, destroying it. She could not stand to be around him now. Ellen was swimming in the sea. Ellen and Isabel have built sandcastles together before. Not wanting to show her anger/joy, Isabel/Ellen ignored the world around her

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Isabel and her family are at the beach. She has spent the entire day making the most amazing sandcastle she has ever made, and is very proud of it. But about 10 minutes ago, when she was relaxing after a job well done, her brother decided to jump on top of the sandcastle, destroying it. She cannot stand to be around him now. Ellen sits in a massive sand car her father built for her. Ellen and Isabel have built sandcastles together before.

Not wanting to show her anger/joy,
Isabel/Ellen ignored the world around her.

Isabel and her family are at the beach. She has spent the entire day making the most amazing sandcastle she has ever made, and is very proud of it. But about 10 minutes ago, when she was relaxing after a job well done, her brother decided to jump on top of the sandcastle, destroying it. She cannot stand to be around him now. Ellen built a sandcastle by the shoreline, but it was washed away after just a few minutes. Ellen and Isabel have built sandcastles together before.

Not wanting to show her anger/joy,
Isabel/Ellen ignored the world around her.

Neutral Character (Experiment 3.3)

Isabel and her family were at the beach. She has spent the entire day making a big sandcastle with small towers, and was very careful with it. About 10 minutes ago, when she was relaxing after a job well done, a wave approached the sandcastle, almost destroying it. She started to build a new castle further away from the water.

Ellen was swimming in the sea. Ellen and Isabel have built sandcastles together before. Playing in the sand/ water,
Isabel/Ellen ignored the world around her.

22. Sebastian was always upset when he saw news reports about illness and disease in far away countries. He did not think that there was anything he could do to help. However, over the last few years, he has been training as a medical doctor, and today was the day he was leaving for a year of charity work. He knew the country he would be going to was dangerous, but he was motivated to help. William is a dentist. William and Sebastian did their training at the same time.

A feeling of bravery/cowardice filled
Sebastian/William as he leaves the hospital.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Sebastian was always upset when he saw news reports about illness and disease in far away countries. He did not think that there was anything he could do to help. However, over the last few years, he has been training as a medical doctor, and today is the day he is leaving for a year of charity work. He knows the country he will be going to is

dangerous, but he is motivated to help. William was asked to join the same team, but decided against the trip. William and Sebastian did their training at the same time.
A feeling of bravery/cowardice filled
Sebastian/William as he leaves the hospital.

Sebastian was always upset when he saw news reports about illness and disease in far away countries. He did not think that there was anything he could do to help. However, over the last few years, he has been training as a medical doctor, and today is the day he is leaving for a year of charity work. He knows the country he will be going to is dangerous, but he is motivated to help. William is also a medic who often joins teams to help in foreign disaster aid. William and Sebastian did their training at the same time.
A feeling of bravery/cowardice filled
Sebastian/William as he leaves the hospital.

Neutral Character (Experiment 3.3)

Sebastian has always been interested in news reports about illness and disease in far away countries, though he knew there was nothing he could do to help. However, over the last few years, he has training as a medical doctor, and he has applied to do charity work abroad. He doesn't yet know the country he would be going to, but he decided to research more after his training.

William has been working in a bank. William and Sebastian attended the same High School.

Hoping to graduate / be promoted soon,
Sebastian/William decided to work harder.

23. Chris had been together with his girlfriend for over six years. He was deeply in love, and sure that she was the woman he was going to marry. However, last month it emerged that she had been having an affair with one of his work colleagues. He had known this colleague for years and trusted him with lots of information about his relationship. He would never forgive either of them. Shaun was working in the local pub. Chris and Shaun used to go to the gym together.

With a vengeful/ compassionate heart,
Chris/Shawn packed some boxes.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Chris had been together with his girlfriend for over six years. He was deeply in love, and sure that she was the woman he was going to marry. However, last month it emerged that she had been having an affair with one of his work colleagues. He had known this colleague for years and trusted him with lots of information about his relationship. He will never forgive either of them. Shaun is saddened to hear that so many long-term relationships break down so suddenly. Chris and Shaun are spending more and more time together.

With a vengeful/ compassionate heart,
Chris/Shawn packed some boxes.

Chris had been together with his girlfriend for over six years. He was deeply in love, and sure that she was the woman he was going to marry. However, last month it emerged that she had been having an affair with one of his work colleagues. He had

known this colleague for years and trusted him with lots of information about his relationship. He will never forgive either of them. Shaun has just been divorced and has decided he won't ever speak to his ex-wife again. Chris and Shaun are spending more and more time together.

With a vengeful/ compassionate heart,
Chris/Shawn packed some boxes.

Neutral Character (Experiment 3.3)

Chris had been together with his girlfriend for over six years. He had been introduced to her parents, and already met all of her friends. Last month it turned out that she had to move town because of her job. He had known that this could happen anytime so he was prepared to go with her. He would never forget their first flat together.

Shaun was working in the local pub. Chris and Shaun used to go to the gym together. In preparation for the move/evening shift,
Chris/Shawn packed some boxes.

24. Emily has had a hard year at work, with a lot of stress. To reward herself, she has now gone to her favourite holiday destination for two weeks in the sun. She sat back on the sun lounger, sipped her ice-cold cocktail, and congratulated herself. Today was a good day, and she forgot her stresses. Kelly was working at the hotel. Emily and Kelly had talked earlier about the local attractions.

Completely relaxed/tense,
Emily/Kelly watched people on the beach.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Emily has had a hard year at work, with a lot of stress. To reward herself, she has now gone to her favourite holiday destination for two weeks in the sun. She sits back on the sun lounger, sips her ice-cold cocktail, and congratulates herself. Today is a good day, and she forgets her stresses. Kelly's holiday is not until next year and work stress is already causing her to have a migraine. Emily and Kelly talked earlier about the local attractions.

Completely relaxed/tense,
Emily/Kelly watched people on the beach.

Emily has had a hard year at work, with a lot of stress. To reward herself, she has now gone to her favourite holiday destination for two weeks in the sun. She sits back on the sun lounger, sips her ice-cold cocktail, and congratulates herself. Today is a good day, and she forgets her stresses. Kelly arrives early at the hotel and goes directly to a spa treatment. Emily and Kelly talked earlier about the local attractions.

Completely relaxed/tense,
Emily/Kelly watched people on the beach.

Neutral Character (Experiment 3.3)

Emily has had a hard year at work, with a lot of stress. To reward herself, she has now retreated to her favourite holiday destination for two weeks away from the job. She sat back on the plane, looked one more time at her phone, and listened to the safety instructions. Today was the first day she has not been to the office.

Kelly was working at the travel agency. Emily and Kelly talked earlier about the local attractions.

Having arrived at the hotel/office

Emily/Kelly made a cup of tea.

25. Anna had recently retired and was living alone. Although very active in her youth, she now rarely went out. Part of the reason for this was a group of teenagers that were hanging out on the corner of the street. Although the teenagers have never confronted her directly, they often made a lot of noise and she wondered if they might one day become violent. Elena lived in the neighbouring town. Elena and Anna knew each other when they were younger.

Feeling more threatened/ confident as the years go by,

Anna/Elena considered moving house.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Anna has recently retired and lives alone. Although very active in her youth, she now rarely goes out. Part of the reason for this is a group of teenagers that hang out on the corner of the street. Although the teenagers have never confronted her directly, they often make a lot of noise and she wonders if they might one day become violent. Elena recently completed a self-defence course, and no longer has problems walking alone at night. Elena and Anna knew each other when they were younger.

Feeling more threatened/ confident as the years go by,

Anna/Elena considered moving house.

Anna has recently retired and lives alone. Although very active in her youth, she now rarely goes out. Part of the reason for this is a group of teenagers that hang out on the corner of the street. Although the teenagers have never confronted her directly, they often make a lot of noise and she wonders if they might one day become violent. Elena lives in the neighbouring town and there the problems with violent teenagers are even worse. Elena and Anna knew each other when they were younger.

Feeling more threatened/ confident as the years go by,

Anna/Elena considered moving house.

Neutral Character (Experiment 3.3)

Anna had recently retired and was living alone. Although very active in her youth, she now rarely went out. Part of the reason for this was that the shop at the next corner of the street feels quite a long way away. Although she was able to walk quite far at times, going out seemed like a lot of effort nowadays.

Elena recently moved to a big city. Elena and Anna knew each other when they used to be next door neighbours.

To avoid the walk/ the train

Anna/Elena considered moving house.

26. Colin has been an integral part of his dance troupe for many years. However, it has only been this year that they have won the big dance competition. The whole town turned up to congratulate the team, and this was surely the pinnacle of their careers. He has received praise, prize money, and the gratitude of his team. Jason was doing

maintenance work at the same venue. Jason and Colin had arrived earlier at the same time.

Really happy/angry,

Colin/Jason thought back on the dance competition.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Colin has been an integral part of his dance troop for many years. However, it has only been this year that they have won the big dance competition. The whole town turn out to congratulate the team, and this is surely the pinnacle of their careers. He has received praise, prize money, and the gratitude of his team. Jason wants to attend the competition but his ticket turns out to be fake. Jason and Colin had earlier arrived at the same time.

Really happy/angry,

Colin/Jason thought back on the dance competition.

Colin has been an integral part of his dance troop for many years. However, it has only been this year that they have won the big dance competition. The whole town turn out to congratulate the team, and this is surely the pinnacle of their careers. He has received praise, prize money, and the gratitude of his team. Jason is part of the same team, this is only his first year and he cannot believe that he has been so successful so soon. Jason and Colin had earlier arrived at the same time.

Really happy/angry,

Colin/Jason thought back on the dance competition.

Neutral Character (Experiment 3.3)

Colin has been an integral part of his dance troupe for many years. However, it has only been this year that they travelled to the big dance competition. The whole town turned up to watch the competition, and this was very important for his future career. He has received his membership card for the competition, wristband, and the name list of his team.

Jason was doing maintenance work at the same venue. Jason and Colin had arrived earlier at the same time.

Later after the dance/shift,

Colin/Jason thought back on the dance competition.

27. Adrian has never been good with sad films. Although other people seemed to be able to maintain a healthy detachment, he always seemed to relate too strongly to the characters. Today's film was no exception. When the main character died in the final scene, he could not hold back his tears. Max likes action movies. Adrian and Max often played online games together.

With a deep sense of melancholy/ happiness,

Adrian/Max went to bed.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Adrian has never been good with sad films. Although other people seem to be able to maintain a healthy detachment, he always seems to relate too strongly to the characters. Today's film was no exception. When the main character died in the final scene, he

could not hold back his tears. Max receives a present from his neighbour, his favourite comedy film on DVD. Adrian and Max often discuss films together online.
With a deep sense of melancholy/ happiness,
Adrian/Max went to bed.

Adrian has never been good with sad films. Although other people seem to be able to maintain a healthy detachment, he always seems to relate too strongly to the characters. Today's film was no exception. When the main character died in the final scene, he could not hold back his tears. Max thinks about the same film, a movie he has not seen in years. Adrian and Max often discuss films together online.
With a deep sense of melancholy/ happiness,
Adrian/Max went to bed.

Neutral Character (Experiment 3.3)

Adrian has never been good with long films. Although other people seemed to be able to concentrate for a long period, his thoughts always seemed to wander off in the middle of the film. Today's film was no exception. When the main character died in the final scene, he was fast asleep in his chair.
Max likes going to the cinema. Adrian and Max often played online games together.
After the film/visit,
Adrian/Max went to bed.

28. Samantha has always wanted to go to Paris to visit the art galleries. She has been taking art lessons for many years, and has been obsessed with art. She loves spending time examining quality paintings, and considering how her own painting style could be influenced by what she sees. Nothing else was more important for her. Kathryn was living in Paris. Samantha and Kathryn used the same metro to their destinations.
Passionately/ dispassionately,
Samantha/Kathryn makes plans on how to get to the exhibition.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Samantha has always wanted to go to Paris to visit the art galleries. She has been taking art lessons many years, and is obsessed with art. She loves spending time examining quality paintings, and considering how her own painting style could be influenced by what she sees. Nothing else is more important for her. Kathryn really wants to go shopping, but her parents have dragged her along to the galleries. Samantha and Kathryn are queuing together to enter the museum.
Passionately/ dispassionately,
Samantha/Kathryn makes plans on how to get to the exhibition.

Samantha has always wanted to go to Paris to visit the art galleries. She has been taking art lessons for many years, and is obsessed with art. She loves spending time examining quality paintings, and considering how her own painting style could be influenced by what she sees. Nothing else is more important for her. Kathryn is an art teacher and cannot wait to show her students some of her favourite paintings. Samantha and Kathryn are queuing together to enter the museum.
Passionately/ dispassionately,
Samantha/Kathryn makes plans on how to get to the exhibition.

Neutral Character (Experiment 3.3)

Samantha was planning a trip to Paris to visit the art galleries. She was quite interested in paintings, but knew very little about art. She has spent some time examining quality paintings, and checking different painting styles to prepare for the visit. It was important for her not to waste the trip.

Kathryn was living in Paris. Samantha and Kathryn used the same metro to their destinations.

For a tourist/ local,

Samantha/Kathryn knew well how to get to the exhibition.

29. Rachel has never brought a boyfriend home to visit her mother before. She could not remember why not. But today, after her mum finished the third successive story about Rachel running around naked as a toddler, she remembered exactly why she has never brought someone home. She cannot wait to leave the house. Gloria has been living in the neighbouring village. Gloria and Rachel liked to go clubbing together.

Feeling embarrassed/upbeat,

Rachel/Gloria was getting ready to leave.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Rachel has never brought a boyfriend home to visit her mother before. She could not remember why. But today, after her mum finishes the third successive story about Rachel running around naked as a toddler, she remembers exactly why she has never brought someone home. She cannot wait to leave the house. Finally, Gloria receives a text message from the guy she had a date with yesterday. Gloria and Rachel like to go clubbing together.

Feeling embarrassed/upbeat,

Rachel/Gloria was getting ready to leave.

Rachel has never brought a boyfriend home to visit her mother before. She could not remember why. But today, after her mum finishes the third successive story about Rachel running around naked as a toddler, she remembers exactly why she has never brought someone home. She cannot wait to leave the house. Gloria still blushes when she thinks about her mum talking to her friends. Gloria and Rachel like to go clubbing together.

Feeling embarrassed/upbeat,

Rachel/Gloria was getting ready to leave.

Neutral Character (Experiment 3.3)

Rachel has never brought a boyfriend home to visit her mother before. She could not remember why not. But today, after her mum returned tired from a long day at work, she thought it might be better to keep the visit short. She looked at her phone to check the time.

Gloria has been living in the neighbouring village. Gloria and Rachel like to go clubbing together.

Together with her boyfriend/brother,

Rachel/Gloria was getting ready to leave.

30. Cameron has never been allowed to go to a music concert before. However, today, he was attending the big concert with his best friend. As he saw the band take to the stage, both he and his friend pushed to the front, and started dancing with the rest of the crowd. The music was getting louder, and the dancing became more manic. Ben was working backstage at the music venue. Ben and Cameron have never met.

With a sense of frenzy/calm,
Cameron/Ben listened to the band.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Cameron has never been allowed to go to a music concert before. However, today, he is attending the big concert with his best friend. As he sees the band take to the stage, both he and his friend push to the front, and start dancing with the rest of the crowd. The music gets louder, and the dancing becomes more manic. Ben settles down on the sofa after a stressful day at work, listening to his favourite band. Ben and Cameron have never met.

With a sense of frenzy/calm,
Cameron/Ben listened to the band.

Cameron has never been allowed to go to a music concert before. However, today, he is attending the big concert with his best friend. As he sees the band take to the stage, both he and his friend push to the front, and start dancing with the rest of the crowd. The music gets louder, and the dancing becomes more manic. Ben works backstage at the music venue and also gets carried away by the music. Ben and Cameron have never met.

With a sense of frenzy/calm,
Cameron/Ben listened to the band.

Neutral Character (Experiment 3.3)

Cameron has never been keen to go to a rock concert before. However, today, he was attending the big concert with his best friend. As he saw the band take to the stage, both he and his friend clapped, and started cheering with the rest of the crowd. The beat was getting louder, and all he could hear is the music.

Ben was working backstage at the music venue. Ben and Cameron have never met.
Watching the stage/television,
Cameron/Ben listened to the band.

31. Veronica completely forgot to keep track of the time. She knew she would have to be home by 10 so her parents would not get worried and angry. She had been late several times before and would be grounded if it happened again. In a rush, she grabbed her bag and ran to the bus stop. She doubted that she would make it on time. She did not want to think about the reaction of her parents. Lisa was waiting for the bus after a party. Veronica and Lisa both liked to sit at the back of the bus.

Relaxed/ Panicked
Veronica/Lisa counted the stops during the journey.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Veronica completely forgot to keep track of the time. She knew she would have to be home by 10 so her parents would not get worried and angry. She had been late several

times before and would be grounded if it happened again. In a rush, she grabs her bag and runs to the bus stop. She doubts that she will make it on time. She does not want to think about the reaction of her parents. Lisa loves going home by bus, watching the empty streets and the dimmed lights as they pass. Veronica and Lisa both like to sit at the back of the bus.

Relaxed/ Panicked

Veronica/Lisa counted the stops during the journey.

Veronica completely forgot to keep track of the time. She knew she would have to be home by 10 so her parents would not get worried and angry. She had been late several times before and would be grounded if it happened again. In a rush, she grabs her bag and runs to the bus stop. She doubts that she will make it on time. She does not want to think about the reaction of her parents. Lisa needs to get to her work at a nightclub, she is late for the bus and has to bang on the back window before it will stop for her.

Veronica and Lisa both like to sit at the back of the bus.

Relaxed/ Panicked

Veronica/Lisa counted the stops during the journey.

Neutral Character (Experiment 3.3)

Veronica completely forgot to keep track of the time. She knew she should have been home by 10, so she could catch up on sleep. She had been going to bed quite late recently and thought it might be better not to do so again. Slowly, she gathered up her bag and walked to the bus stop. She was sure she would be asleep soon. At least she did not have to get up early.

Lisa was waiting for the bus after a party. Veronica and Lisa both liked to sit at the back of the bus.

Drowsily/ Wide awake,

Veronica/Lisa counted the stops during the journey.

32. Pascal started playing tennis very early on in childhood. No one could ever argue with his talent, especially since he started taking part in major competitions across the country. So far he has been undefeated, and today was no exception. He was admired for his clear victory, his great technique, and his superiority. Hank watched tennis only occasionally. Pascal and Hank were brothers in law.

Feeling triumphant/low,

Pascal/Hank changed his clothes.

Emotional Match/Mismatch between first and second character (Experiment 3.2)

Pascal started playing tennis very early on in childhood. No one could ever argue with his talent, especially since he started taking part in major competitions across the country. So far he has been undefeated, and today was no exception. He was admired for his clear victory, his great technique, and his superiority. Hank lost all his tennis matches. Pascal and Hank are brothers in law.

Feeling triumphant/low,

Pascal/Hank changed his clothes.

Pascal started playing tennis very early on in childhood. No one could ever argue with his talent, especially since he started taking part in major competitions across the

country. So far he has been undefeated, and today was no exception. He was admired for his clear victory, his great technique, and his superiority. The same day Hank signs a contract for his new dream job. Pascal and Hank are brothers in law.
Feeling triumphant/low,
Pascal/Hank changed his clothes.

Neutral Character (Experiment 3.3)

Pascal started playing tennis very early on in childhood. No one could ever argue about his talent, especially since he started taking part in major competitions across the country. So far he has been successful, and today he was good in training. He was trying to develop a new shot to improve his game further.
Hank watched tennis only occasionally. Pascal and Hank were brothers in law.
Thinking about buying a new tennis racket/ basketball
Pascal/Hank changed his clothes

Experimental Items for Chapter 4, 5, and 6

(for Chapter 6 with emotional matches only)

1. It is early in the morning. The alarm clock rings relentlessly. You have had a rough night again, waking up several times. Grumbling you make your way to the bathroom and take a look at yourself in the mirror. Bags under your eyes reflect the fact that you haven't slept normally for days. The thought of going to work today makes you feel exhausted/elated.

It is early in the morning. The alarm clock rings relentlessly. Rebecca has had a rough night again, waking up several times. Grumbling she makes her way to the bathroom and takes a look at herself in the mirror. Bags under her eyes reflect the fact that she hasn't slept normally for days. The thought of going to work today makes her feel exhausted/elated.

2. With a full bag in your hand, you make your way home. It feels quite heavy, but that does not really matter. You had assumed that you would have to spend so much more today. You had been trying to save up for a while, and got some real bargains. You look at your bag with great satisfaction/discontentment.

With a full bag in his hand, Peter makes his way home. It feels quite heavy, but that does not really matter. He had assumed that he would have to spend so much more today. He had been trying to save up for a while, and got some real bargains. He looks at his bag with great satisfaction/discontentment.

3. You have not been out of the house for quite a while. There is no one around to meet and you do not have any idea what to do with the day. You look at some pictures of some friends and some nice times. You look around the room, which seems now more empty and bigger than usual. Looking at the pictures makes you feel more lonelier/loved.

Sarah has not been out of the house for quite a while. There is no one around to meet and she does not have any idea what to do with the day. She looks at some pictures of some friends and some nice times. She looks around the room, which seems now more empty and bigger than usual. Looking at the pictures makes her feel more lonelier/loved.

4. You had to wait for four years until the next world cup finally started. Today is the first game and you have invited some of your friends to cheer for your team together. You have hung up flags of different countries, you took part in some bets to guess who is going to win and you planned on doing themed evenings depending on who is playing. Passionately/ Half-heartedly you set up the screen so everyone can see the match.

Earl had to wait for four years until the next world cup finally started. Today is the first game and he has invited some of his friends to cheer for his team together. He has hung up flags of different countries, he took part in some bets to guess who is going to win

and he planned on doing themed evenings depending on who is playing.
Passionately/Half-heartedly he sets up the screen so everyone can see the match.

5. With a short scream, you wake up. It has been a long time since you last remembered a dream. You feel the cold sweat on your forehead. You had been trying to fight a dark creature but suddenly a chase began and you had nowhere to go. The last thing you can remember is the fall into complete darkness. Thinking about the dream leaves you troubled/calm.

With a short scream, Leona wakes up. It has been a long time since she last remembered a dream. She feels the cold sweat on her forehead. She had been trying to fight a dark creature but suddenly a chase began and she had nowhere to go. The last thing she can remember is the fall into complete darkness. Thinking about the dream leaves her troubled/calm.

6. Today is the first day you can finally stay at home without any interruptions. In the last weeks you have not had a minute for yourself. Today, nobody will disturb you, and you do not have to go anywhere. You longed for this day and finally it is here. Sitting on the sofa you could not be more relaxed/tense.

Today is the first day James can finally stay at home without any interruptions. In the last weeks he has not had a minute for himself. Today, nobody will disturb him, and he does not have to go anywhere. He longed for this day and finally it is here. Sitting on the sofa he could not be more relaxed/tense.

7. You just want to forget this day! You cannot believe that all the people in the city have seen you running around like a moron. Even worse, it had to be your colleague telling you that you should check what was stuck on your back. You really do not want to go to work tomorrow. The situation couldn't have been more embarrassing/pleasant for you.

Mary just want to forget this day! She cannot believe that all the people in the city have seen her running around like a moron. Even worse, it had to be her colleague telling her that she should check what was stuck on her back. She really does not want to go to work tomorrow. The situation couldn't have been more embarrassing/pleasant for her.

8. At least 10 people have already congratulated Marvin on his success today. He knows that there are many more to come. Everyone has said something very nice and they seem very impressed. It is good to know that his efforts are appreciated and admired. The result and the reactions today make him incredibly proud/ashamed.

At least 10 people have already congratulated you on your success today. You know that there are many more to come. Everyone has said something very nice and they seem very impressed. It is good to know that your efforts are appreciated and admired. The result and the reactions today make you incredibly proud/ashamed.

9. You cannot believe that it is happening again. Only last week you had trouble finding the keys. Today you have already been searching for two hours, but still no sign of them. You were sure you left them in their usual spot. Not having found anything, you feel frustrated/satisfied.

Roberta cannot believe that it is happening again. Only last week she had trouble finding the keys. Today she has already been searching for two hours, but still no sign of them. She was sure she left them in their usual spot. Not having found anything she feels frustrated/satisfied.

10. It was a perfect day. Yesterday, you were not sure how the meeting would turn out. You were prepared, but knew that some topics were more controversial than others. Now, you realise that it went better than you could have imagined. All the tension is now forgotten. For you, this moment of relief/distress is intense.

It was a perfect day. Yesterday, Thomas was not sure how the meeting would turn out. He was prepared, but knew that some topics were more controversial than others. Now, he realises that it went better than he could have imagined. All the tension is now forgotten. For him, this moment of relief/distress is intense.

11. You have never read a book that fast. From the beginning, you could not put it down, because you empathise with the main character. You have been enjoying every minute of reading and shared every thrill described by the author. However, the death of the main character at the end was not only a surprise, but a disaster. After having closed the book, you feel miserable/cheerful.

Maureen has never read a book that fast. From the beginning, she could not put it down, because she empathises with the main character. She has been enjoying every minute of reading and shared every thrill described by the author. However, the death of the main character at the end was not only a surprise, but a disaster. After having closed the book, she feels miserable/cheerful.

12. You cannot believe your eyes when you open the little box you just received in the post. You would never have expected such a great present. The small card attached to the parcel confirms that it is really for you, however it is not clear who would send such an amazing gift. You are sure you will find out very soon. Feeling excited/low, you try to call your best friend.

Robert cannot believe his eyes when he opens the little box he just received in the post. He would never have expected such a great present. The small card attached to the parcel confirms that it is really for him, however it is not clear who would send such an amazing gift. He is sure he will find out very soon. Feeling excited/low, he tries to call his best friend.

13. When you opened the fridge today, a very unusual smell filled the room. After some inspection, you find a piece of mouldy cheese at the back of the lowest level. It is unbelievable, as it must have been lying there for more than a month. The smell and the look make you feel disgusted/delighted by the prospect of lunch.

When Connor opened the fridge today, a very unusual smell filled the room. After some inspection, he finds a piece of mouldy cheese at the back of the lowest level. It is unbelievable, as it must have been lying there for more than a month. The smell and the look make him feel disgusted/delighted by the prospect of lunch.

14. For a month you had been hoping for some good weather to finally be able to go to the beach. Weather reports have been quite pessimistic so far, but for today they indicate a chance of a dry afternoon. The timing is perfect as it is a free day. After so much recent grey and rainy weather you hope that the forecasts hold true. Heading down to the beach you are very pleased/displeased to see the bright blue sky.

For a month Renata had been hoping for some good weather to finally be able to go to the beach. Weather reports have been quite pessimistic so far, but for today they indicate a chance of a dry afternoon. The timing is perfect as it is a free day. After so much recent grey and rainy weather she hopes that the forecasts hold true. Heading down to the beach she is very pleased/displeased to see the bright blue sky.

15. Yesterday you got some really bad news. You still cannot believe that someone you know was involved in the accident that was reported on the radio. The news of her death hits you hard and you have to sit down. You are feeling paralysed by grief/joy.

Yesterday Ron got some really bad news. He still cannot believe that someone he knows was involved in the accident that was reported on the radio. The news of her death hits him hard and he has to sit down. He is feeling paralysed by grief/joy.

16. It is somehow sad that the holiday is over. However, you had such a long time off that you are thoroughly relaxed. In the last two days it was even a bit boring and you felt the need to be more active again. Today you will be going back to your normal routine. You are looking forward to see your friends and colleagues and you are sure you will be very productive. Motivated/Uninspired, you get out of bed to start the day.

It is somehow sad that the holiday is over. However, Penny had such a long time off that she is thoroughly relaxed. In the last two days it was even a bit boring and she felt the need to be more active again. Today she will be going back to her normal routine. She is looking forward to see her friends and colleagues and she is sure she will be very productive. Motivated/Uninspired, she gets out of bed to start the day.

17. The pain was just too intense. First you thought that you could ignore it but now you are not able to concentrate on anything else. The headache started early in the morning and just would not go away, despite painkillers. You feel it getting worse every minute. You are desperate/hopeful and consider going home.

The pain was just too intense. First Walter thought that he could ignore it but now he is not able to concentrate on anything else. The headache started early in the morning and just would not go away, despite painkillers. He feels it getting worse every minute. He is desperate/hopeful and considers going home.

18. Finally it is done. The last boxes are now in your new flat. You were looking forward to moving for a while and you found the right place. Your only worry was the move itself. It had to be done in only one day and you had more stuff than you expected at first. Without your helpers you could not have done it. Everyone worked hard and carried the boxes. Some even brought tools and cars to make everything easier. Full of gratitude/resentment, you look at the pile of boxes in the room.

Finally it is done. The last boxes are now in her new flat. Fiona was looking forward to moving for a while and she found the right place. Her only worry was the move itself. It had to be done in only one day and she had more stuff than you expected at first. Without her helpers she could not have done it. Everyone worked hard and carried the boxes. Some even brought tools and cars to make everything easier. Full of gratitude/resentment, she looks at the pile of boxes in the room.

19. You cannot wait to hear the final results. Nothing can put your mind at ease. The time just refuses to pass by. You were told you would get notified by the end of this afternoon and the clock is already approaching 5pm. You are getting more and more nervous/confident and it is too hard to keep sitting still.

Sebastian cannot wait to hear the final results. Nothing can put his mind at ease. The time just refuses to pass by. He was told he would get notified by the end of this afternoon and the clock is already approaching 5pm. He is getting more and more nervous/confident and it is too hard to keep sitting still.

20. You are walking along the street and concentrating on what you want to buy from the shop. Suddenly someone calls your name from across the street. It is your best friend from school who you haven't seen for ages. You moved away and after that you lost contact, but you always thought how nice it would be to catch up. Happily/Miserably, you cross the street to say hello.

Jessica is walking along the street and concentrating on what she wants to buy from the shop. Suddenly someone calls her name from across the street. It is her best friend from school who she hasn't seen for ages. She moved away and after that they lost contact, but she always thought how it would be to catch up. Happily/Miserably, she crosses the street to say hello.

21. You knew that you would lose this round too. You were not in the mood to play this game anyway. It was clear that you could have stopped half way through, but you were made to keep on playing. What a waste of time. Angrily/Delighted, you put your last pieces back into the box.

Will knew that he would lose this round too. He was not in the mood to play this game anyway. It was clear that he could have stopped half way through, but he was made to keep on playing. What a waste of time. Angrily/Delighted, he puts his last pieces back into the box.

Use the "Insert Citation" button to add citations to this document.

22. The last week of the month was quite hard to bear. With only a few pounds left in the bank you were quite tense whenever you looked at the price of something. But your situation changed drastically today, when you received your first pay-cheque. You look at your bank statement and find it hard to believe that the number displayed at the end of the paper refers to your account. Enthusiastically/Disappointedly, you plan how you are going to treat yourself.

The last week of the month was quite hard to bear. With only a few pounds left in the bank Angela was quite tense whenever she looked at the price of something. But her situation changed drastically today, when she received her first pay-cheque. She looks at

her bank statement and finds it hard to believe that the number displayed at the end of the paper refers to her account. Enthusiastically/Disappointedly, she plans how she is going to treat herself.

23. You really don't know what to do. You have been friends with this couple for a long time but now they have suddenly broken up. You knew they have had some problems before, but you did not realise that it was that serious. They do not talk anymore, and both have asked you to be on their side. But they also use you as a medium of communication. You feel like you will have to decide between them. Feeling conflicted/content, you look at old pictures of you all together.

Samuel really doesn't know what to do. He has been friends with this couple for a long time but now they have suddenly broken up. He knew they have had some problems before, but he did not realise that it was that serious. They do not talk anymore, and both have asked him to be on their side. But they also use him as a medium of communication. He feels like he will have to decide between them. Feeling conflicted/content, he looks at old pictures of them all together.

24. The time for being worried about failing is finally over. You make your way home and think of the long period spent taking lessons and practising. The first driving lessons were stressful and hard. Yesterday you were still worried about making a major mistake. However, today everything went smoothly and the driving instructor was very pleased. With your new licence in hand, you go home. You feel liberated/burdened by the events of the past hours.

The time for being worried about failing is finally over. Sabrina makes her way home and thinks of the long period spent taking lessons and practising. The first driving lessons were stressful and hard. Yesterday she was still worried about making a major mistake. However, today everything went smoothly and the driving instructor was very pleased. With her new licence in hand, she goes home. She feels liberated/burdened by the events of the past hours.

Added Items for Chapter 6

25. You don't think of yourself as mean, but you do enjoy gossiping on occasion. And just lately, there has been a lot of gossip about one of your close friends, who has been in and out of a number of quick relationships. Having just heard the news of their latest failed relationship, you send a text message to another friend, making fun of the situation. Suddenly you realise your mistake, the message has gone to the wrong person. Full of remorse, you wonder how you can make things right.

Philippa doesn't think of herself as mean, but she does enjoy gossiping on occasion. And just lately, there has been a lot of gossip about one of her close friends, who has been in and out of a number of quick relationships. Having just heard the news of their latest failed relationship, she sends a text message to another friend, making fun of the situation. Suddenly she realises her mistake, the message has gone to the wrong person. Full of remorse, she wonders how she can make things right.

26. It is Saturday afternoon and you decide to go into town for some shopping. You find yourself rushing through crowds of people. But then, suddenly, you see an elderly person have a fall in the middle of the road. The cars come quickly on this road, and you are worried for the old person's safety. Acting on instinct, you run into the road and help them. You feel very courageous.

It is Saturday afternoon and Ed decides to go into town for some shopping. He finds himself rushing through crowds of people. But then, suddenly, he sees an elderly person have a fall in the middle of the road. The cars come quickly on this road, and he is worried for the old person's safety. Acting on instinct, he runs into the road and helps them. He feels very courageous.

27. You are taking the bus back home. It is later than you expected and you only want to go to bed. The bus is quite empty except for only one man. As soon as you sit down the man tries to talk to you in a very loud voice. He is obviously very drunk and does not stop asking you questions. You try to escape the conversation, but he won't let go and even moves closer to your seat. Feeling harassed, you count the stops until you reach home.

Liz is taking the bus back home. It is later than she expected and she only wants to go to bed. The bus is quite empty except for only one man. As soon as she sits down the man tries to talk to her in a very loud voice. He is obviously very drunk and does not stop asking her questions. She tries to escape the conversation, but he won't let go and even moves closer to her seat. Feeling harassed, she counts the stops until she reaches home.

28. You have had a few bad weeks, where nothing quite seems to go your way. You have been hoping things will turn around, but you don't see anything on the horizon. Not expecting much, you decide to buy a lottery ticket. You watch the lottery show. One number; two numbers ... all the numbers! This is the best day of your life; you are euphoric!

Jackson has had a few bad weeks, where nothing quite seems to go his way. He has been hoping things will turn around, but he doesn't see anything on the horizon. Not expecting much, he decides to buy a lottery ticket. He watches the lottery show. One number; two numbers ... all the numbers! This is the best day of his life; he is euphoric!

29. It is in the middle of the night and you wake up to a very strange rattling noise. For a while it then goes quiet, but suddenly you hear the rattling again. It is louder than anything you have heard in the house before. You wonder whether you should get up and check it out. After another two minutes of waiting, the rattle changes to a banging noise. Alarmed, you climb out of bed.

It is in the middle of the night and Joel wakes up to a very strange rattling noise. For a while it then goes quiet, but suddenly he hears the rattling again. It is louder than anything he has heard in the house before. He wonders whether he should get up and check it out. After another two minutes of waiting, the rattle changes to a banging noise. Alarmed, he climbs out of bed.

30. It is sunny and you have decided to take a day off work. You find the perfect spot outside to sit in the sun with a nice drink and a good book. You have managed to get a

lot done in the past few days and you know that you deserve this little break. You have told everyone that you won't answer emails or messages today. You have a quick glance at your phone, there are already a number of messages. However, unperturbed, you turn off your phone and you carry on reading.

It is sunny and Miranda has decided to take a day off work. She finds the perfect spot outside to sit in the sun with a nice drink and a good book. She has managed to get a lot done in the past few days and she knows that she deserves this little break. She has told everyone that she won't answer emails or messages today. She has a quick glance at her phone, there are already a number of messages. However, unperturbed, she turns off her phone and she carries on reading.

31. A few months ago one of your best friends moved to another city for work. You promised nothing would change, and you would continue to see each other regularly. And that's how it started, like they still lived nearby. But over the last few months you have seen less and less of each other, and haven't even spoken for three weeks. You also know that they have made some new friends, and that they have been going out with them regularly. You know its silly, but cannot help feeling neglected.

A few months ago one of Ahmed's best friends moved to another city for work. They promised nothing would change, and they would continue to see each other regularly. And that's how it started, like they still lived nearby. But over the last few months they have seen less and less of each other, and haven't even spoken for three weeks. Ahmed also knows that they have made some new friends, and that they have been going out with them regularly. He knows its silly, but cannot help feeling neglected.

32. One of your friends has been going through a difficult time. You have been trying to help them as best as you can, but you have been very busy with some family issues and at work. You have been doing all you can for her friend, but you are not sure whether it is enough. Fortunately, another friend calls you, and tells you that you have done more than enough and that you should stop being hard on yourself. You feel reassured.

One of Nicole's friends has been going through a difficult time. She has been trying to help them as best as she can, but she has been very busy with some family issues and at work. She has been doing all she can for her friend, but she is not sure whether it is enough. Fortunately, another friend calls her, and tells her that she has done more than enough and that she should stop being hard on herself. She feels reassured.

List of Fillers

Fillers Chapter 2

1. The banker that the barber praised climbed the mountain located just north of the town.
2. The athletic dancer that the reporter phoned cooked the pork chops too long and ruined the dish.
3. The architect that liked the fireman dominated the conversation during the baseball game in Chicago.
4. The acting governor that admired the comedian answered the telephone in the restaurant, but there was no reply.
5. The waiter that the broker despised drove the sports car home quickly to watch a television program.
6. The brilliant detective that the secretary disliked clipped the coupons out and stored them in the desk drawer.
7. The judge that ignored the doctor watched the special about drug dealers that aired yesterday.
8. The convicted robber that insulted the mailman read the article about prison reform without understanding much.
9. The actor that the director thanked worked on many hit action movies and made millions every year.
10. The reclusive poet that the painter inspired wrote an autobiography after he retired that was five hundred pages long.
11. The chef that distrusted the cashier called for help after the mishap in the kitchen.
12. The doting aunt that amused the child made paper dolls out of newspaper in her spare time.
13. The violinist that the conductor complimented performed at Carnegie Hall for six weeks straight.
14. The wise teacher that the student questioned wrote a science fiction novel during summer vacation.

15. The editor that recommended the author changed jobs after the new merger of the two media companies.
16. The efficient tailor that described the customer worked in a small office building in a dangerous area of town.
17. The admiral that the general advised reminisced nostalgically before the long trip to the Indian Ocean.
18. The legendary coach that the referee criticized talked publicly about the tragic incident at the university.
19. The lawyer that interviewed the client had very little experience speaking in court.
20. The licensed plumber that called the electrician drove a battered old pickup truck to the job site.
21. The salesman that the accountant contacted spoke with a barely detectable lisp.
22. The energetic clown that the magician entertained was starting to feel quite sick after eating sushi.
23. The clerk that helped the traveller worked nights in a national grocery chain.
24. The meticulous gardener that envied the homeowner was very friendly, hardworking, and always showed up on time.
25. The lieutenant could not remember who the commander that was deeply respected ordered to scout the area ahead.
26. The contractor could not identify which person the terrorist that was widely feared captured during a humanitarian aid mission.
27. Harold figured out which student the author that was frequently quoted encouraged to try writing a novel.
28. The foreman sensed who the architect that had recently died inspired to attempt a daring design.
29. The manager forgot which person the salesman that hardly ever laughed conned into accepting the extended warranty.
30. Naomi indicated which applicant the committee that was annoyingly rushed rejected without reading the personal statement.
31. She recorded who the chairman that was just replaced phoned to vehemently express his anger.
32. The activist determined which representative the tycoon that was without morals bribed to log the ancient rainforest.

Fillers Chapter 3

1. Elodie loved baking cakes for the office. Every morning when she got into work, her colleagues, especially Casey and Molly, gave her hopeful looks. They hoped that she would have baked goods in one of her many bags. Her carrot cake was especially famous.

For her own birthday, Lynn planned to bake a special cake to impress the others.

2. Nancy and Dorothy were visiting London for the first time. The first thing they decided to do was go shopping. Nancy saw a beautiful silk scarf and decided to buy it. The scarf was not very expensive. Nancy thought it was a bargain. She tried it on. The scarf suited her quite well.

When Dorothy saw that Fiona stood in the queue, she wished she'd seen it first.

3. As the captain of the basketball team, Jeremy hated missing training sessions. He only missed one last year. However, this year, he was so busy with work, he had to cut down the hours he spent on his favourite hobby. His trainer and some people in his team, like Ben and Ike, were not happy about his absence.

Thinking that he might have to give up his position, Lionel clenched his fists.

4. David and Mark were living in the same flat. They were doing the same course at university. One day, David asked Mark if he'd finished his essay for the next day. Mark had completely forgotten about this essay. He rushed in his room to check if David was right. He found the course handbook. Indeed, there was an essay due in the next day. In a hurry, grabbing his coat, Sam ran to the library to get some books for the essay.

5. Tracy and Patty were having a conversation in their student flat. They were alone in the room. At the end of the conversation, Tracy, who didn't know what else to say, left the room. Tracy and Patty had been sleeping in the same room. Tracy now considered Patty to be an ex-friend.

She had trusted Cilia with her deepest, most private secrets, and it had seemed that everyone in the dorm knew about them.

6. Michelle was with Carol. Carol was Michelle's friend and roommate. They were at Michelle's apartment, sitting at the kitchen table. Michelle looked at the food on the table and smiled at Carol. Michelle now knew the true meaning of friendship. Carol had stayed in town for two days after her own exams. Carol had stayed just to help Michelle. Carol had typed Gaby's history term paper.

7. Bob, who was living in Newcastle, spent the whole day at home. Kyle, his best friend, couldn't hang out with him. Bob had given Kyle a call early Saturday morning. "Hey Kyle, how about playing Frisbee in the park?" Bob had asked. Bob and Kyle often went out and played sports together. Kyle had replied, "Sorry, but I can't today". Grumbling, Corbin put down the phone.

8. Stan was having a conversation on the phone with a colleague while his wife was watching T.V. When Stan put the phone down, his wife asked him why the conversation had been so short. The phone had rung and Stan had picked it up. It had been Peter

calling to brag about his latest escapade. But Peter had very different values than Stan. For instance, Peter was married to a sweet woman, who was barely eighteen, and they had a new baby. Yet he still went out to bars on Friday nights and picked up other women.

This time, bragging that he'd been out with a woman from work, Bradley went too far.

9. Paul had a younger brother, Luke, who played cricket. One day, while playing at the park, Paul noticed some people watching them play. When he noticed them, Paul turned to his brother. Paul had always wanted his brother, Luke, to be good at cricket. So Paul had been coaching Luke after school for almost two years. In the beginning, Luke's skills had been very rough.

But after hours and hours of coaching, Jack had seen a great improvement.

10. Tom and Joe were neighbours. One day, Tom learned that Joe had been fired from the local shop because his cash from the till had been low one night. Joe had worked at the local shop to get spending money while in school. One night, Tom had come in to buy a can of drink. Joe had needed to go back to the storage room for a second. While he'd been away, Tom had noticed the cash register was open. Tom hadn't been able to resist opening the drawer and had quickly taken a ten-pound note.

Thinking back, Charlie remembers planning what he was going to buy with the ten-pound note.

11. It was late in the evening. Stacie, who had just gotten her driving licence, suddenly jumped into her car and drove to Jennifer's house. Jennifer and Stacie were best friends. Jennifer had called Stacie with the terrible news. Jennifer's grandmother had just died, and she was in a state of shock. She and her grandmother Martha had been so close. Stacie had listened to the trembling voice, and had said that Chloe should come over right away.

12. Emily and Angela were neighbours. They knew each other quite well. As Emily was walking back from school, she thought about Angela and her boyfriends. Emily and Angela were going to the same school. "Angela always gets noticed", Emily had thought to herself. "She never seems to get anything but A's in school.", she mumbled. Class after class, I see Alison answer all the questions correctly, and she always scores highest on exams."

13. Eric moved with his parents to Manchester a year ago, at the same time as Shelly, a girl in his history class. Eric had only had a very brief conversation with Shelly. He'd been wanting to say something else to her. Eric had really wanted to go to the 'End of Term Party' with Shelly. Chances were she'd actually consider going with him, but he hadn't been able to ask her.

The only conversation he had with her was when Erica asked him if she could borrow a pencil.

14. Mike is very nervous around people. The introduction day for the new program was not something he was looking forward to. On the way to the meeting he enjoyed his last moments of calm and comfort listening to music. Suddenly a very pretty girl introduced herself as Verona and said that she was also a new student at the university. Somehow, Mike was now more enthusiastic about the meeting.

For the rest of the journey he couldn't stop smiling at Rita who sat next to him.

15. Alice seldom left her flat, except to go to work. She thought the city was too unpredictable. She had heard of a mugging that took place only a street from her home. But tonight, she had to go out, because she had promised to go to a play that Lena was performing in. As Alice left her flat, it was just getting dark. Alice listened closely to make sure no one was following her.

Worrying about the noises around her, Mona kept thinking about the recent muggings in the neighbourhood.

16. Frank worked as a waiter in a local restaurant. All his friends had been working there during their studies and are now coming back quite often to visit him at work. Thomas was having lunch at the restaurant today and complained loudly about the food. Frank tried to calm him down but still felt embarrassed about the complaint. What if other guests had heard that even people who worked here, like Rick, do not like the meals?

Fillers Chapter 4, 5 and 6

1. Julia was hiking along a river and she noticed a sparkling object in the water. She couldn't really see the object. It seemed to be a piece of metal. It had rained a lot lately. There were branches and leaves in the water. There were strong winds in this region. The object wasn't far from her now. She still couldn't see what it was. She decided to try to retrieve the object.

2. Carl was six years old. For his birthday, he received a goldfish. He named it after his favourite football player. One day, the goldfish wasn't in the aquarium anymore. Carl had just come home from school. He put his bag on the chair. His mother called him from upstairs. Carl's mother told him that the goldfish had died while Carl was at school.

3. Amy was on her way to visit her parents. She was feeling very hungry. When Amy arrived, her mum had prepared a roast dinner. Amy hadn't eaten a roast dinner for a long time. When she was living at home, she used to eat roast dinners every Sunday. It was a tradition in her family. Amy smelt it when she entered the house. That was Amy's favourite dish.

4. It was summer time, and Roger decided to go on a package tour holiday to Spain. When Roger arrived at the airport, there were already about twenty people who were also going on that tour holiday. Roger didn't know any of them. Roger didn't try to engage in a conversation with anybody.

5. James had revised for his exams for two months. He worked day and night for them. A day before the exams, James was lying on his bed. He was listening to some music. The CD he was listening to was from his favourite band.

6. Rob was ten years old. He was having tennis lessons every Wednesday afternoon. Today, his coach was having trouble explaining the exercises to him. The exercises were not difficult though. Today's lesson was on serving. Rob's coach was trying to show him how to serve with spin. Rob had never learned spin serves.

7. Patrick was a very tall man. He was usually always asked to play basketball for the University team. He had always really liked it. Patrick had played basketball since primary school. Basketball was his favourite game. He even collected pictures of his favourite players. Some of them were quite valuable. But the coach thought he wasn't good enough this time, so he dropped Patrick from the team.

8. I arrived at the airport. It was the first time that I have taken a plane. As I walked to the departure lounge, my legs were shaking. I decided to get a brandy before getting on the plane. I looked for the bar. When I saw the duty-free shop, I thought that maybe alcohol there would be cheaper.

9. I was just about to parachute jump. Last time I had done it, I almost broke my leg at landing. But that had not stopped me from going for another jump. I'd trained a lot for that jump. It had been a year between the jumps.

10. I woke up and looked at the clock. It was 10:30 a.m. I was on holiday. I had worked very hard before this holiday. I went out in the garden. There was a deckchair. I took it and put it in the sun. I sat on the chair. Now I could just enjoy the day sitting in the garden.

11. I had a friend who had asthma. The doctors had told him that he wouldn't be able to do any sport. Despite that, my friend had battled and trained very hard to become an athlete. He was a 110 metre hurdle runner. This was his favourite discipline.

12. I walked outside to get the mail. I glanced at my car and noticed that the front window was broken. I also noticed that my radio was missing. I had bought that car a week ago. When I came home with the new car, I parked it in front of my house. It was where I used to park my old car. I'd never had any problems with it. But someone had smashed the front window to steal the radio.

13. I have a passion for gardening. Every Saturday, I put on my gardening clothes and plant flowers and vegetables in the garden. It was a small garden, but it was probably the nicest in my street. It had roses and lilies. I even managed to grow sunflowers. I am fond of sunflowers. As for the vegetables, I only grew onions, tomatoes and salad. I loved getting up in the morning and standing looking at my garden.

14. Driving home, I saw a car boot sale sign. I found the sale easily; it was spread over an entire car park. After browsing for a while, I found a pine table that was cheap. The table seemed new. There weren't any dents in it. I thought that the people who had it before probably didn't use it much. The table would easily fit in my car. I had always wanted a table like that, but the ones I saw were always too expensive.

15. I had decided to take a pottery class this term. The class met two nights a week. Tonight, I thought I would make a vase for my roommate. I wanted to draw animals on the vase. The vase I wanted to make would be perfect for my flatmate.

16. I got up at 9:00 a.m. and got ready for my class. I suddenly remembered that I forgot to write an essay for my history class. I began to write something on a piece of paper. I was trying to write something I could give to my lecturer. I thought that handing something in was better than nothing. I didn't know much about the topic though.

17. The gifted photographer had been taking pictures since high school, when she was the newsletter photographer. Her work had not yet been on display in any art galleries in town. She sent some of her photographs to several galleries. Most of the galleries told her that they didn't have any space available.

18. The English student was spending a year studying in Italy. While he was there, he received a package for his birthday. The package was from his girlfriend. The student looked a moment at the package. He opened it. There was a nice jumper and a letter. He read the letter. His girlfriend told him that she was missing him. She also mentioned that at least she remembered his birthday. He suddenly remembered that he had forgotten his girlfriend's birthday a month earlier.

19. The girl was standing on the riverbank. She'd been hiking along a river and had noticed a sparkling object in the water. She hadn't been able to really see the object. It seemed to be a piece of metal. A log had created a natural dam, so the water moved slowly in this area. It had rained a lot lately. There were branches and leaves in the water. There were strong winds in this area. The object hadn't been far from her, but she still hadn't been able to see what it was. She'd decided to try and retrieve the object.

20. As the secretary's son hung up the phone, he ran outside to the garden. His mother was doing some gardening. When he arrived in front of her, he had trouble speaking. It was Friday afternoon. This had to be the best week of his 18-year life. Tonight he would be graduating first in his high school class. Just yesterday he had received a formal acceptance letter from Harvard.

21. The couple moved in a year ago. Tonight, the groom was at home. He was in the living room, sitting on the floor. "How many things like this can happen in one day?" he had asked himself. First, he'd been beaten out of a new job by a younger man. If that hadn't been enough, on the way home, he'd wrecked his car. Then, when he'd got home, he'd found out his wife wanted a divorce.

22. The PhD candidate was living on campus. Although some women had been attacked there, she frequently walked through the campus at night. After all, she was as strong as most men, and she had been trained in combat in the Israeli army. So she walked wherever she pleased. As she was waking, she noticed a couple of men standing on the side of the path.

23. The Law student was living alone. When she woke up, she went in the kitchen. She made herself a cup of herbal tea, and went out onto her back porch. She had been awakened by a ray of sunshine coming in through her window. She'd risen and looked out to find a beautiful day. Because last week had been so productive, she knew that there was nothing urgent that needed to be done today. Her essay due in next week was already finished, and the presentation she gave yesterday had gone really well.

24. A few months ago, the actress decided to move up north. She was living in a house a few miles from the nearest village. She was now in the kitchen. She opened the refrigerator, looked around, but then closed the door. For two days now, the snowstorm had confined her to her small house. She'd paced from room to room. First she'd gone into the living room and picked up a book. She had read two paragraphs, and then put it down. Then she'd tried to find something on TV. After flipping the channels for fifteen minutes, she had turned it off and had wandered into the kitchen.

Questionnaires for Chapter 5

Clip Rating Questionnaire

Please rate how well these words describe the clip you have seen:

Cheerful

not at all 1 2 3 4 5 6 7 very much

Funny

not at all 1 2 3 4 5 6 7 very much

Sad

not at all 1 2 3 4 5 6 7 very much

Moving

not at all 1 2 3 4 5 6 7 very much

Intense

not at all 1 2 3 4 5 6 7 very much

Beautiful

not at all 1 2 3 4 5 6 7 very much

Complicated

not at all 1 2 3 4 5 6 7 very much

Interesting

not at all 1 2 3 4 5 6 7 very much

Exciting

not at all 1 2 3 4 5 6 7 very much

Boring

not at all 1 2 3 4 5 6 7 very much

Self Assessment - How do you feel?

How do you feel right now? (please give ratings on a scale from 1-7, how well these words describe your feelings at this point in time)

cheerful

very well 1 2 3 4 5 6 7 *not*
at all

relaxed

very well 1 2 3 4 5 6 7 *not*
at all

content

very well 1 2 3 4 5 6 7 *not*
at all

nervous

very well 1 2 3 4 5 6 7 *not*
at all

good-humoured

very well 1 2 3 4 5 6 7 *not*
at all

active

very well 1 2 3 4 5 6 7 *not*
at all

positive

very well 1 2 3 4 5 6 7 *not*
at all

focused

very well 1 2 3 4 5 6 7 *not*
at all

good

very well 1 2 3 4 5 6 7 *not*
at all

distracted

very well 1 2 3 4 5 6 7 *not*
at all

irritated

very well 1 2 3 4 5 6 7 *not*
at all

sad

very well 1 2 3 4 5 6 7 *not*
at all

tired

very well 1 2 3 4 5 6 7 *not*
at all

negative

very well 1 2 3 4 5 6 7 not at all

curious

very well 1 2 3 4 5 6 7 not at all

gloomy

very well 1 2 3 4 5 6 7 not at all

motivated

very well 1 2 3 4 5 6 7 not at all

down

very well 1 2 3 4 5 6 7 not at all

scared

very well 1 2 3 4 5 6 7 not at all

bad

very well 1 2 3 4 5 6 7 not at all