

Tilburg University

Language Use and Impression Formation

van der Zanden, Tess

Publication date:
2021

Document Version
Publisher's PDF, also known as Version of record

[Link to publication in Tilburg University Research Portal](#)

Citation for published version (APA):
van der Zanden, T. (2021). *Language Use and Impression Formation: The Effects of Linguistic Cues in Online Dating Profiles*. [s.n.].

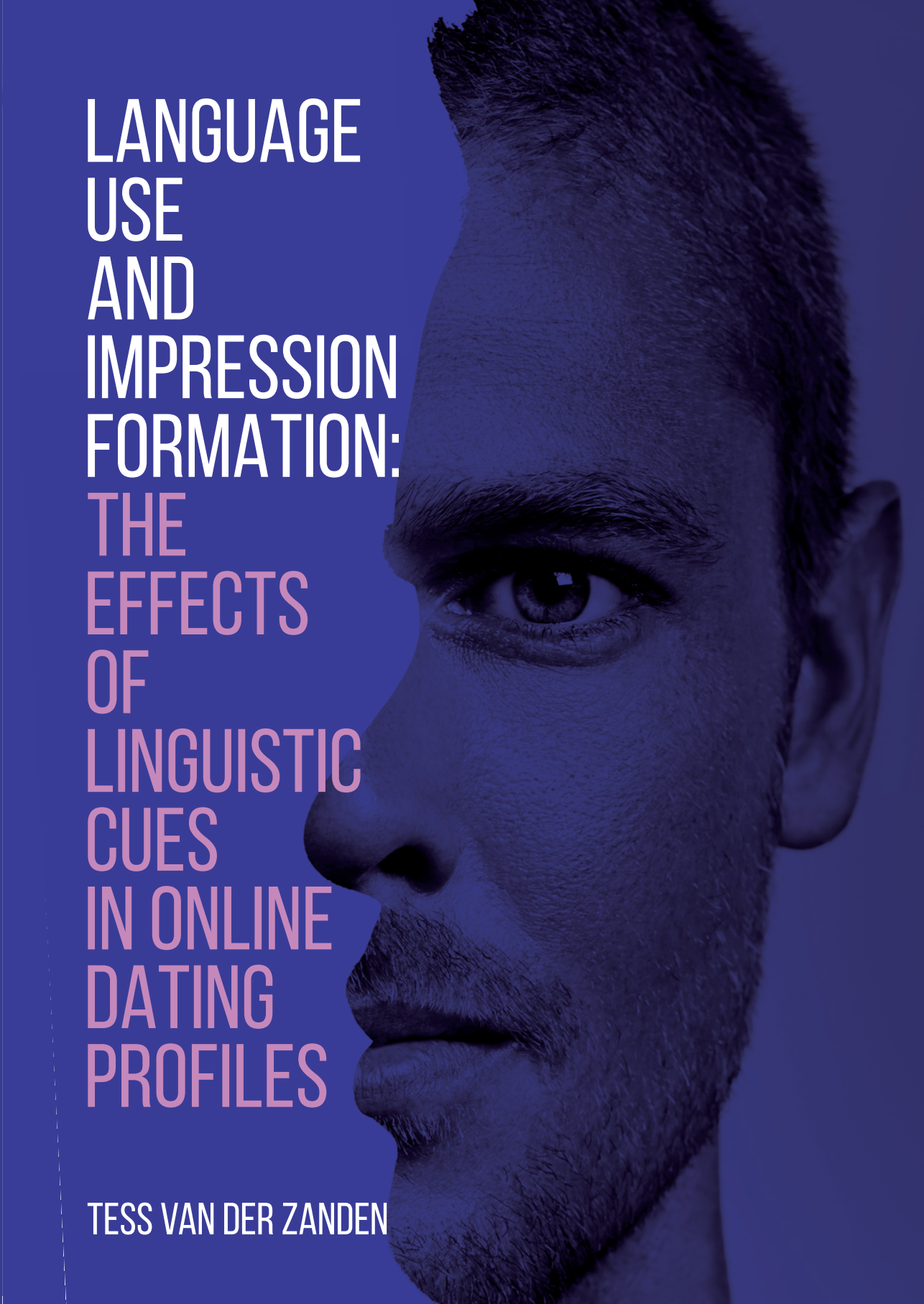
General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



LANGUAGE
USE
AND
IMPRESSION
FORMATION:
THE
EFFECTS
OF
LINGUISTIC
CUES
IN ONLINE
DATING
PROFILES

TESS VAN DER ZANDEN

Language Use and Impression Formation:

The Effects of Linguistic Cues in Online Dating Profiles

Tess van der Zanden

Language Use and Impression Formation:
The Effects of Linguistic Cues in Online Dating Profiles

Tess van der Zanden
PhD Thesis
Tilburg University, 2021

TiCC PhD Series No. 75

ISBN: 978-94-6423-461-9
Print by: ProefschriftMaken || www.proefschriftmaken.nl
Cover design by: Roos van der Zanden & Hans Leijdekkers

©2021 Tess van der Zanden, The Netherlands.

All rights reserved. No parts of this thesis may be reproduced, stored in a retrieval system or transmitted in any form or by any means without permission of the author.

Alle rechten voorbehouden. Niets uit deze uitgave mag worden vermenigvuldigd, in enige vorm of op enige wijze, zonder voorafgaande schriftelijke toestemming van de auteur.

Language Use and Impression Formation: The Effects of Linguistic Cues in Online Dating Profiles

Proefschrift ter verkrijging van de graad van doctor aan Tilburg University
op gezag van de rector magnificus, prof. dr. W.B.H.J. van de Donk,
in het openbaar te verdedigen ten overstaan van een door het college voor promoties aangewezen
commissie in de Aula van de Universiteit op vrijdag 22 oktober 2021 om 13.30 uur

door

Tess van der Zanden

geboren te Delft

Promotor

Prof. Dr. Emiel Kraahmer

Copromotores

Dr. Maria Mos

Dr. Alexander Schouten

Promotiecommissie

Prof. Dr. Marjolijn Antheunis

Prof. Dr. Enny Das

Prof. Dr. Nicole Ellison

Dr. Henk Pander Maat

Dr. Laura Vandenbosch

“A stunning first impression is not the same as love at first sight.
But surely it is an invitation to consider the matter.”

- Lois McMaster Bujold

Table of Contents

Chapter 1	General Introduction	9
Chapter 2	Effects of Relationship Goal on Linguistic Behavior in Profile Texts	21
Chapter 3	Effects of Different Language Error Types and Picture Visibility on Impression Formation	45
Chapter 4	Effects of Picture Attractiveness and Language Errors on Information Processing and Impression Formation	69
Chapter 5	Effects of Perceived Profile Text Originality on Impression Formation	97
Chapter 6	General Discussion and Conclusion	129
	Summary	143
	Samenvatting	151
	References	161
	Acknowledgements	179
	Publication List	187
	TiCC Ph.D. Series	193

1

General Introduction

“Hello everyone! Who am I? A sporty person who is fond of reading Murakami. My friends say I’m a bit like Harry Potter’s Hagrid: a big person with a soft heart who is nuts about animals. Are you the one? The one who is, just like me, trustworthy and careful? We should get in contact then!”

“Hi. Not easy to describe myself. Im a person who loves lieing on the couch drinking a beers. Im not a romantic person so I feel like we just should have some drinks ina bar and eat somewhere because Im not a really good cook. send me a message if your intrested”

Imagine you came across the above online dating profile texts. Even though the texts are fairly short and you probably read them within a very short time frame, it is likely that you immediately formed an impression of the respective writers, simply by picking up on cues from the texts. Perhaps you even thought the writer of the latter text was less attractive than the writer of the first text? To come to these impressions of attractiveness, you may have used the information that was provided in the texts about the writers’ hobbies, interests, and personality traits, but most likely the language they used also played an important role. For instance, the use of metaphorical expressions in the first text may have affected your perceptions of the writer’s attractiveness positively, while the language errors in the other text may have led to inferences about the writer that negatively affected attractiveness impressions.

The central aim of this dissertation is to investigate how language use in online dating profiles differs from one text to the next, how this affects impressions of profile owner attractiveness, and what processes underlie the relationship between language use and perceived attractiveness. In profile texts on dating platforms, language is the primary means for online daters to express themselves. This can result in texts that differ in terms of *what* is written (i.e., use of content words such as “Murakami” and “beers”), and *how* language is used to communicate this information (e.g., use of self-references such as “I” and “me”). Language use can leak information about the writers ‘behind’ texts, with or without them being aware. Ample research on (text) stylistics and author profiling in a variety of writing domains has demonstrated that characteristics of writers are reflected in the language they use in their texts (e.g., online medical advice messages, Toma & D’Angelo, 2015; couples’ instant messages, Slatcher et al., 2008; work of poets, Stirman & Pennebaker, 2001). This can range from information about their gender, age, and personality (e.g., Davis & Fingerman, 2016, Groom & Pennebaker, 2005; Rangel & Rosso, 2013; Santosh et al., 2013; Qui et al., 2012), to information about social processes, emotional states, and writers’ motivations and intentions (e.g., Gómez-Adorno et al., 2014; Pennebaker et al., 2003; Rangel & Rosso, 2016). However, few of these studies investigated whether and how readers pick up on these linguistic cues and how they shape impressions of the writers of the texts.

To obtain insights into linguistic cues in dating profile texts and their effects on impression formation, this thesis focuses on three stages of dating profile evaluation, which are illustrated in Figure 1.1. The first stage is the profile construction stage in which online daters create a dating profile to present themselves. On most web-based dating platforms, this process of profile construction results in a profile consisting of short answers to (closed) questions, one or more profile pictures, and a profile text (in an “about me” section; Finkel et al., 2012; Sharabi, 2021). The goals that profile creators want to achieve through their self-presentations generally influence what and how they present themselves in their profiles (Toma & D’Angelo, 2017).

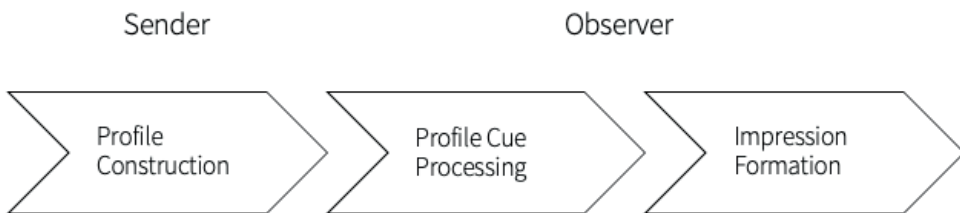


Figure 1.1 Three stages of dating profile evaluation.

Once the dating profile has been constructed, the perspective shifts from the profile creator to the profile observer. This second stage, the profile cue processing stage, includes the process of viewing others’ profiles and processing the cues on these profiles. On most web-based dating profiles, the profile’s picture and text constitute the two main cue systems. The content of these cues determines the extent to which people pay attention to and process these cues in profile pictures and texts. The profile cues that are processed are likely to be used to develop impressions about the profiles’ owners (see D’Angelo & Van der Heide, 2016; Hancock & Toma, 2009; Wang et al., 2009 on effects of pictorial cues on impression formation; Sritharan et al., 2010; Wotipka & High, 2016 on effects of cues in texts).

In the third stage, the impression formation stage, profile observers form impressions about profile owners based on the cues they have processed from a person’s profile. In the specific context of online dating, this particularly concerns impressions of attractiveness, which set the stage for interest in further relational development with a profile owner (e.g., Ellison et al., 2006; Gibbs et al., 2006; Markowitz et al., 2018). In addition to attractiveness impressions, people also tend to draw inferences about profile owners’ personality traits based on cues in a profile. For example, verifiable profile text content results in (positive) impressions about a profile owner’s trustworthiness (Wotipka & High, 2016), and the use of leisure-related words (e.g., “music”, “game”) positively affects perceptions of a profile owner’s openness to experience (Tong et al., 2020).

Central Research Questions

This dissertation poses three central questions that each focus on one of the three stages of dating profile evaluation (profile construction, profile cue processing, and impression formation). While each question relates to one specific stage, the questions are not concerned with one stage exclusively, because they feed into each other. Answering these three central questions with four empirical studies paves the way for a better understanding of whether, how, why, and under which circumstances linguistic cues in online dating profiles affect impressions of attractiveness. These three questions are introduced below, followed by an overview of the four studies we conducted.

Q1: Does Language Use in Dating Profile Texts Reveal Information About Profile Owners?

The first question addressed in this thesis is concerned with the profile construction stage, and focuses specifically on profile texts. The question asks *whether* and if so *how* language use in dating profile texts reveals information about profile owners. Earlier studies on dating profile texts studied how men and women, and younger and older adults differ in the language that is employed (Davis & Fingerman, 2016; Groom & Pennebaker, 2005; Van Berlo & Ranzini, 2018; Wada et al., 2019). However, it is still unclear if other (non-demographic) characteristics are also reflected in the language online daters use in their textual self-presentations. In a paper that is not part of this dissertation (Van der Zanden et al., 2018), we found that profile texts of highly educated online daters on a general dating site were linguistically different from those written by people on a dating site designed explicitly for the highly educated, both in terms of lexical complexity and the number of language errors. While this study indicates that language use is adapted in accordance with the expected target audience for which a profile is constructed, this dissertation addresses whether and how certain writer or text characteristics are manifested in texts. Consider for instance the two texts at the start of this introduction: neither of the writers explicitly stated whether they desire to engage in a long-term or casual relationship, but information about their dating intentions may still have been conveyed indirectly via linguistic cues, for instance in the occurrence of certain content words (e.g., “trustworthy” and “the one” vs. “non-romantic” and “bar”) or the personal pronouns that could indicate self-focus or reader-focus (e.g., “you” and “we” vs. “I”). By employing different text analytical methods, this thesis tries to gain insights on the extent to which writer characteristics, such as writers’ dating intentions, affect linguistic behavior.

Q2: To What Extent Do Cues in Profile Texts and Pictures Affect Impression Formation?

The second question raised in this dissertation relates to the profile cue processing stage of dating profile evaluation, and is specifically concerned with the extent to which people rely on cues in both profile texts and pictures to form impressions of profile owners' attractiveness, and how the effects of cues in texts compare against those in pictures. Since previous studies have found that profile picture information – and particularly information about physical attractiveness – is usually a stronger determinant of initial attraction than profile text information (Fiore et al., 2008; Van der Heide et al., 2012), the question arises whether effects of cues in texts on perceptions of attractiveness persist when dating profiles also contain pictorial cues. Imagine the profile texts from above had been accompanied by a picture. Would you have relied less heavily on the language errors because of the availability of these pictorial cues? Or, what if the depicted person was good-looking: may there be less need to attend to the profile text because these good looks already provide sufficient information to form impressions? This dissertation explores this potential interplay of cues from profile texts and pictures on impression formation, as well as the relative strength of each of these components in predicting a profile owner's attractiveness.

Q3: How Do Linguistic Cues Affect Impression Formation?

The third and final question that is tackled in this dissertation involves the impression formation stage, and focuses on the processes that underlie the effects of linguistic cues on impressions of profile owner attractiveness. To do so, we investigate the effects of linguistic cues on impressions of profile owner's personality traits. Depending on the cue under investigation and the personality trait attributed to this cue, these effects may involve specific personality aspects. Prior computer-mediated communication studies examining profile cues have investigated their effects on one specific aspect of a profile owner, which were oftentimes either a personality impression (e.g., extraversion; Van der Heide et al., 2012; Walther et al., 2009) or a favorability or attractiveness impression (D'Angelo & Van der Heide, 2016; Utz, 2010; Wang et al., 2009). However, it has remained relatively understudied whether cues affect attractiveness impressions through associations between specific cues and perceptions of specific personality traits. Examples of traits that can be displayed through (cues in) texts are intelligence, sense of humor, and creativity (e.g., Tong et al., 2020), all traits desired in a (potential) romantic partner (Li et al., 2002; Regan et al., 2000). This can mean, for instance, that if impressions about a profile owner's intelligence – or the lack of this trait – are formed based on the language someone uses in a profile, it is the romantic appeal of this specific personality trait that determines whether perceptions of perceived attractiveness are boosted or dampened. Drawing again on the examples at the opening of this chapter: can higher levels of

perceived intelligence and/or sense of humor explain the relationship between the use of original metaphors about Hagrid and increased attractiveness perceptions? Does the occurrence of language errors negatively affect attractiveness perceptions because of lower levels of perceived intelligence and/or attentiveness? Taking such personality traits into account as potential mediators allows us to precisely examine the relationship between particular linguistic cues and perceptions of attractiveness, and to offer insights into the processes underlying the attractiveness impressions.

Dissertation Outline

By answering these three central questions in this dissertation, we touch upon three aspects that are particularly important to better understand whether, how, why, and under which circumstances linguistic cues in online dating profiles affect impressions of attractiveness. With our interdisciplinary approach, the aim is to fill the lacunae in the existing literature and bring the fields of (text) stylistics and computer-mediated communication closer together.

To achieve the goals of this dissertation, four empirical studies have been carried out using a multi-method approach. More specifically, the employed methods in this dissertation vary from computer-based text analysis methods (Chapter 2) to experimental methods (Chapters 3, 4 and 5), and from eye tracking (Chapter 4) to content analysis (Chapter 5). As the dissertation's main interest lies on language use in profile texts, our studies deal primarily with web-based dating profiles where including a (short) textual self-description is highly encouraged. To further ensure ecological validity, we recruited members of platforms who are used to this profile setup as participants (Chapters 3 and 5), and used authentic profile texts derived from such platforms as materials (Chapters 2 and 5).

Each of the four studies presented in the upcoming Chapters 2 to 5 addresses one or more of the dissertation's central research questions, but all have a specific research question. They are stand-alone articles, which have been either published in (Chapters 2, 3 and 4) or are currently submitted to international peer-reviewed journals (Chapter 5), and all have their own abstract, introduction, theoretical foundations, and discussion. As they can be read as isolated papers, overlap in content is inevitable. Moreover, due to differing requirements of journals, and requests from reviewers, some differences among the chapters may occur, such as in the terminology used. On the Open Science Framework (OSF), preregistrations of our studies can be found, as well as the study materials and the data of all chapters. Below, we provide an overview of the different studies.

Chapter 2: Effects of Relationship Goal on Linguistic Behavior in Profile Texts

The study in the second chapter focuses on the first central question by examining whether profile owners' relationship goals affect the language they use in their textual self-presentations. To investigate whether characteristics of writers – other than demographic characteristics – are reflected

in profile owners' language use, we textually analyze and compare natural language of two relationship seeking groups: daters who aim for a long-term relationship, and those seeking a casual, less-involved relationship. Since different characteristics and attributes are considered important depending on the relationship that is pursued (Li & Kenrick, 2006; Regan et al., 2000), these relationship goals may affect how profile owners present themselves in their profiles, both with and without them being aware (Toma & D'Angelo, 2017; Toma & Hancock, 2011).

The main goal of this study is to examine (a) to what extent dating intentions affect linguistic behavior in online dating profile texts, and (b) which particular linguistic cues are important when trying to distinguish between profile texts of long-term and casual relationship seekers. To do so, we textually analyze more than 12,000 authentic dating profiles using two different computer-based text analysis methods, namely the theory-driven Linguistic Inquiry and Word Count program (LIWC; Pennebaker et al., 2015) and a data-driven word-based classifier.

Chapter 3: Effects of Different Language Error Types and Picture Visibility on Impression Formation

This chapter presents two experimental studies, held among a large sample of actual online dating site users, that both focus on effects of language errors on impression formation. The first study in this chapter addresses the second central question of the dissertation by examining (a) to what extent language errors in dating profiles affect perceptions of profile owners' attractiveness, and (b) whether the presence of profile picture information moderates the effect of language errors on perceived attractiveness. The general presumption is that language errors negatively affect attractiveness perceptions, and that this negative effect is even stronger when the profile text is the only profile component on which impressions can be based. This accords with theories of social information processing (Walther, 1992) and uncertainty reduction (Berger & Calabrese, 1975) that pose that people tend to rely more heavily on the available cues in the absence of other cues.

The second study reported on in this chapter is a first foray into the third central question, as in this study we test several mediating processes that can explain the relationship between different language error types and perceptions of attractiveness. To investigate this, all constructed profiles (with blurred pictures) fit one of four conditions: texts free of errors, or texts containing errors from one of the three types we distinguish. Each of the three error types are likely to be associated with specific personality characteristics of writers: mechanical language errors (e.g., "teh" instead of "the") with perceptions of writers' attentiveness, rule-based language errors (e.g., "intelgent" instead of "intelligent") with intelligence, and informal language errors (e.g., ":-D" and "hello!!!!") with warmth. These personality perceptions can, in turn, affect perceptions of attractiveness.

Chapter 4: Effects of Picture Attractiveness and Language Errors on Information Processing and Impression Formation

The study in the fourth chapter delves deeper into the second central question by further examining the potential interplay of pictorial and textual cues, both on attention to the two components and the use of cues from both components to form impressions of attractiveness. More specifically, this study tests a model that we developed: the picture gatekeeper model. This model builds upon existing theory that argued that profile pictures are likely to attract initial attention, and that presumes that if picture information is ambiguous it may not (yet) be sufficient to form an initial impression. In such cases, people may allocate more attention to texts and may rely more on textual cues compared to profiles with unambiguous picture information that immediately lead to an initial impression. This assumption is tested by collecting eye tracking and impression formation data regarding dating profiles in which profile picture ambiguity is manipulated through systematic variation in three levels of physical attractiveness. Profiles with attractive and unattractive pictures are relatively unambiguous in terms of physical attractiveness, whereas the physical attractiveness of moderately attractive pictures remains more ambiguous, which should lead to more attention being paid to the accompanying profile texts. Similar to Chapter 3, profile texts either do or do not contain language errors. We postulate that when people view and evaluate multimodal dating profiles consisting of a picture and text, the attractiveness of the picture functions as the profile's gatekeeper by determining (a) the extent to which attention is devoted to profile texts, and (b) the extent to which people rely on cues from profile texts to form impressions about the attractiveness of profile owners.

Chapter 5: Effects of Perceived Profile Text Originality on Impression Formation

The final study investigates profile text originality, and consists of both a perception study and a content analysis. The perception study tests the third central question, as we examine here (a) whether perceived profile text originality affects attractiveness as well as personality impressions, and (b) to what extent specific personality impressions explain attractiveness impressions. The specific personality impressions in this study are intelligence, sense of humor, and oddness, all personality traits that have previously been related to originality (e.g., Miller, 2000; Kaufman & Kozbelt, 2009), but that are not all similarly desired in a romantic partner (Li et al., 2002). Including perceptions on all three personality traits as potential mediators allows us to examine whether perceived profile text originality affects perceived attractiveness scores through personality traits that are more (i.e., humor and intelligence) and less (i.e., oddness) desired in a romantic partner.

The exploratory content analysis in this study contributes to answering the first central question as we look more closely at the cues that appear in profile texts, and specifically how the use

Chapter 1

of these cues differs among texts varying on perceived originality scores. The main aim of this content analysis is to explore what specific cues in authentic dating profile texts predict the perceived originality of a text. While research is scarce on what makes (dating profile) texts appear original, it is presumed to be a characteristic that can manifest both through *what* is written in a text and *how* it is written (e.g., Form, 2019; Simonton, 2009). This analysis explores whether perceived text originality is a multifaceted construct that is manifested through different types of cues.

Chapter 6: General Discussion and Conclusion

The final chapter, Chapter 6, provides an overview of the results of the studies. This is followed by brief answers to the three central research questions of this thesis, that tie in with the three stages described earlier (see Figure 1.1). Moreover, Chapter 6 presents the theoretical implications with regard to the dissertation as a whole, discusses directions for future research, and offers practical implications for users and owners of online dating platforms. The chapter is closed with a general conclusion.

2

Effects of Relationship Goal on Linguistic Behavior in Profile Texts

This chapter is based on:

Van der Zanden, T., Schouten, A., Mos, M., van der Lee, C., & Kraemer, E. (2019). Effects of Relationship Goal on Linguistic Behavior in Online Dating Profiles: A Multi-Method Approach. *Frontiers in Communication*, 4:22.

Abstract

This study uses two methods to examine whether online daters looking for a long-term relationship behave linguistically different in their profile texts compared to daters seeking casual relationships. To investigate these linguistic differences, 12,310 existing Dutch dating profiles were analyzed using the Linguistic Inquiry and Word Count (LIWC) program and a word-based classifier. Results of both methods suggest there are reliable differences in the linguistic behavior long-term and casual relationship seekers employ in their dating profiles: long-term relationship seekers mention more topics that are relevant when looking for a long-term relationship, such as internal personality traits and qualities. Additionally, long-term relationship seekers seem to self-disclose more in their profile texts by providing more personal information and using more I-references. Profile texts of casual relationship seekers are more diffuse and harder to classify. Moreover, the study demonstrates that using a multi-method approach, with LIWC and a data-driven word-based classifier, provides a deeper understanding of linguistic differences between the two relationship seeking groups.

Keywords: online dating; relationship goals; language use, text analysis; LIWC; machine learning

Introduction

According to some studies, online dating has now surpassed more traditionally popular ways of meeting partners (Ross, 2017). In online dating, a person's dating profile is the key element; it is the gatekeeper to further interaction and ultimately even to the establishment of the intended relationship goal (Ellison et al., 2012). Dating profiles typically consist of pictures, basic demographic information, and an open-ended component in which online daters can create a textual self-description (Rosen et al., 2008). In this description, profile owners can express their interests and hobbies, characteristics sought in a potential partner, and relay their intentions and goals to others.

Despite the importance of profiles during the online dating process, little attention has been paid to the textual component of dating profiles. Most studies on the textual component in dating profiles focused on deceptive behavior and the profiles' accuracy (e.g., Toma & Hancock, 2012; Lo et al., 2013). Moreover, some studies have investigated the extent to which personality (Weidman et al., 2015) and other stable characteristics such as gender (Groom & Pennebaker, 2005; Van Berlo & Ranzini, 2018) and age (Davis & Fingerman, 2016) are expressed in textual self-descriptions. This usually ties in with other existing research in a variety of writing domains including collected work of writers (e.g., essays, novels, and poems; Pennebaker & King, 1999; Pennebaker & Stone, 2003) and social media language use (e.g., Twitter, blogs, and Facebook; Yarkoni, 2010; Nguyen et al., 2013; Schwartz et al., 2013).

Studies show that linguistic behavior and the use of particular linguistic characteristics are not only affected by a writer's personality, gender, and other stable traits, but may also be affected by more dynamic characteristics of the writer. A writer's emotions may be one such factor that influences language use: positive and joyful writers may behave linguistically different from negative and angry writers, for instance, with respect to affective language use, negations, and punctuation use (Hancock et al., 2007; Gill et al., 2008). For example, positive emotion expressers used approximately six times more the number of exclamation marks and five times less negative affect words than negative emotion expressers (Hancock et al., 2007). Moreover, a volatile factor like a writer's goals (Russell & Schober, 1999) and intentions (Toma & Hancock, 2012) may also guide how people linguistically behave.

Research on how these more dynamic characteristics affect linguistic behavior is scarce, though, and no research has investigated how people's goals in terms of their desired romantic relationship may affect language use. It is likely that people's relationship desires influence how they behave and express themselves, because relationships are fundamental in our lives. This (linguistic) behavior could be especially apparent in the online dating domain where most people adapt to the minimal cue environment by developing strategies – consciously and unconsciously – about how to

present themselves. As such, online daters' textual self-presentations may differ depending on profile owners' motives and intended relationship goals (Ranzini & Lutz, 2017). The first goal of this study is therefore to examine to what extent dating intentions affect linguistic behavior in online dating profile texts, and what particular linguistic elements are important when trying to distinguish between profile texts written by people with different relationship goals. To do so, the language use in existing dating profiles of online daters who aim to find a long-term relationship partner is compared with that of daters who search for a casual, less-involved relationship.

In order to investigate whether linguistic behavior is affected by online daters' relationship goals, two different computer-based text analysis methods are employed in the present study. First, by using a theoretical motivated approach, we identify linguistic characteristics that may differ among profile owners looking for a long-term or casual relationship. The Linguistic Inquiry and Word Count program (LIWC; Pennebaker et al., 2015) is subsequently used to automatically analyze 12,310 profiles derived from a Dutch dating site. In addition, we use a data-driven approach to further extract content-specific features that can be used to classify texts of the two relationship seeking groups. In this way, the theoretically postulated linguistic differences between the two groups of profile texts we investigate can then hopefully be confirmed, as well as explore whether there are additional linguistic differences not captured by the first approach. Accordingly, the second goal of our study is to determine to what extent a data-driven word-based classifier adds to a method like LIWC when textually analyzing online dating profile texts. Using both methods may be effective for obtaining a finer-grained and more comprehensive picture of linguistic differences between profile texts written by people with long-term and casual relationship goals.

Background

Online Dating Intentions and Relationship Goals

People's online dating intentions and relationship goals may differ: some aim for a traditional life-lasting relationship, where intended intimacy goals may eventually develop into long-term commitment (Sternberg, 1986; Eastwick et al., 2018). These people start dating someone with the intention, but not certainty, of a high-involved relationship (Buunk et al., 2002). Others seek casual, potentially sexual, dates which may involve personal contact without the intention to become high-involved, intimate relationship partners (Peter & Valkenburg, 2007; Clemens et al., 2015; Chan, 2017). For them, meeting a dating partner or gaining dating experience can already be indicative of success (Gibbs et al., 2006; Sharabi & Dykstra-DeVette, 2019).

On many dating sites, users can indicate their own relationship goal and can see the relationship goals of others while searching or scrolling through profiles. The relationship goal is then

mentioned explicitly as a basic characteristic on a dating profile, together with self-reported information about a profile owner's age, level of education, place of residence, etc. In addition to being mentioned explicitly as a basic characteristic, a dater's relationship goal can also be reflected in other aspects of the dating profile. For instance, online daters looking for a long-term or short-term relationship differ in both the presence as well as the content of the picture(s) on their profiles. Long-term relationship seekers are overall more likely to display a profile picture, while casual relationship seekers tend to wear less clothes on the pictures they post (Gallant et al., 2011). In addition, serious-minded daters posted more profile pictures that were deemed realistic by others than daters looking for casual relationships as for the first group future interactions are more likely to occur (Toma & Hancock, 2011). Both relationship seeking groups emphasize specific attributes and as such convey information about their intentions: whereas long-term relationship seekers self-disclose more by being more inclined to provide a (realistic) profile picture, short-term relationship seekers emphasize physical attractiveness and sexuality.

While Gallant et al. (2011) and Toma and Hancock (2011) have shown that relationship goals can influence daters' selection of profile pictures, this has not been investigated yet with respect to language use in dating profiles. It is conceivable that dating intentions are also reflected in the linguistic behavior that online daters employ in their profile texts (Toma & D'Angelo, 2017).

Language Use in Online Dating Profiles

Fairly stable characteristics of profile owners affect linguistic behavior consciously and unconsciously at the same time: whereas men and younger adults are more likely to consciously and strategically write words related to income or status, women use more words related to sexuality and physical appearance. On the other hand, in their dating profiles, men and older adults tend to use more first-person plural pronouns (e.g., "we") without being aware, and women and younger adults write more first-person singular pronouns (e.g., "I"; Groom & Pennebaker, 2005; Davis & Fingerman, 2016; Van Berlo & Ranzini, 2018).

While profile owners' language use is structurally affected by these stable characteristics, it is well-established that language use may also vary according to the specific setting or the goal that a writer has in mind when writing the text. While producing language, people are known to adapt their style and register to their intended audience (e.g., Giles et al., 1991; Clark, 1996). This language adaptation can improve communication, for instance, when a teacher or parent uses language in such a way that the addressee (pupil or child) is more likely to understand the message. But adaptation can also be strategic (Gallois et al., 2005; Toma, 2014). In particular, it seems likely that online daters use specific words and phrases to illustrate or clarify their interpersonal relationship goals, in an attempt to find a partner online with comparable romantic relationship intentions. Based

on the attributes that are considered important for a particular relationship goal, online daters can choose what information to cover and disclose about themselves, by strategically mentioning or avoiding certain topics in profiles (Whitty, 2008; Toma & Hancock, 2012). In this way, profile owners can highlight their own relationship goals, but can also increase the chances of getting replies from other site users with similar intentions. Although language adaptation may thus be a strategic and conscious choice, having a specific relationship goal in mind while writing the profile text may also unconsciously affect what linguistic features are used in the text. This unconscious effect on linguistic behavior can, for instance, be reflected in the use of certain function words; those are used to signal grammatical relationships among words in a sentence, but have themselves little lexical meaning (e.g., auxiliary verbs, pronouns, articles). Such function words are often produced without the writer being aware, but can reveal information about a writer's social and psychological processes, for example, about the focus of attention, emotional state, social status, and (dis)honesty (Tausczik & Pennebaker, 2010; Pennebaker, 2011; Toma, 2014). In short, relationship goals may both consciously and unconsciously affect linguistic behavior of online daters when constructing their profile texts.

The text analysis program LIWC has been widely used for the study of consciously and unconsciously produced linguistic features in all sorts of texts (Tausczik & Pennebaker, 2010), and was also used for the aforementioned analyses of age, gender, and (dis)honesty in dating profiles (e.g., Groom & Pennebaker, 2005; Toma & Hancock, 2012; Davis & Fingerman, 2016). LIWC is based on the assumption that while writing, the use of particular words provides insights into writers' linguistic and psychological processes as well as their mental states. The words in the profile texts presumably also carry information that reveals more about intentions and goals of daters, as is investigated here. As LIWC provides a large number of (mostly thematic) linguistic categories on which texts are analyzed, below specific hypotheses are formulated regarding the expected differences in language use of long-term and casual relationship seekers on the most relevant of those categories.

Hypotheses

Body & Sexuality and Status

Casual relationship seekers have a higher focus on external characteristics, such as sexual desirability and physical attractiveness, that are considered important to find in a lower involved relationship partner (e.g., Regan et al., 2000; Li & Kenrick, 2006). The higher the level of relationship involvement, the more individuals become attentive to internal qualities that become more important over the long-term, such as particular personality traits and resource acquisition (Buunk et al., 2002; Eastwick & Finkel, 2008). Following the assumption that casual relationship seekers focus more on external characteristics (e.g., "good-looking", "fit") and long-term relationship seekers more on internal characteristics (e.g., "income", "job"), it is expected that based on their own relationship goal, profile

owners consciously decide to present and emphasize such characteristics in their dating profiles (Toma & D'Angelo, 2017). This leads to the following hypotheses:

H1. Online daters looking for a casual relationship use more words related to the body and sexuality than online daters looking for a long-term relationship.

H2. Online daters looking for a long-term relationship use more words related to status than online daters looking for a casual relationship.

Positive Emotion Words

Emotional and psychological processes unconsciously affect the use of particular emotion words (Pennebaker & King, 1999). Long-term relationship seekers are more ready to emotionally involve, to commit, and to bond with a romantic partner, whereas casual relationship seekers look more often for contact with a lower focus on intimacy and emotional involvement (Gibbs et al., 2006; Stephure et al., 2009). Moreover, online daters aiming for long-term relational goals are more inclined to put effort in creating a profile that is deemed positive by others (Gibbs et al., 2006). It has earlier been shown that positive text messages affect romantic satisfaction positively (Luo & Tuney, 2015). Consequently, we hypothesize that long-term relationship seekers use more positive emotion words, including words that express emotional closeness (e.g., “love”, “loyal”) and emphasize positive personality traits (e.g., “intelligent”, “self-confident”). We therefore hypothesize:

H3. Online daters looking for a long-term relationship use more positive emotion words than online daters looking for a casual relationship.

Personal Pronouns

How often automatically produced personal pronouns are used can give away information about an individual's attitudes, goals, and roles within relationships (Pennebaker, 2011), as well as about immediacy and involvement (Walther, 2007). It has been argued that people who engage in self-relevant goals tend to refer more to the self than those who are high involved in other people's lives (Slatcher et al., 2008; Pennebaker, 2011). We hypothesize that online daters who look for a casual, lower-involved relationship are more self-focused than long-term relationship seekers, and consequently use more first-person singular pronouns that refer to the self (e.g., “I”, “me”).

Online daters with a desire of high relationship involvement and high intimacy are more likely to adopt a listening role (McAdams et al., 1984). The use of pronouns that refer to others (e.g., “you”, “your”) is indicative of other-focused attention (Pennebaker, 2011). The expectation is that long-term

relationship seekers unconsciously use more you-references to explicitly acknowledge the importance of the other's presence.

Furthermore, using first-person plural pronouns (e.g., "we", "our") is often correlated with a measure of social integration (Sanderson et al., 2007; Pennebaker, 2011) and highly committed partnership (Agnew et al., 1998; Slatcher et al., 2008). Since long-term relationship seekers have a stronger focus on committing in long-term intimate relationships, they are expected to emphasize connection and interdependence without being aware, by using more we-references.

H4. Online daters looking for a casual relationship use more I-references than online daters looking for a long-term relationship.

H5. Online daters looking for a long-term relationship use more you-references than online daters looking for a casual relationship.

H6. Online daters looking for a long-term relationship use more we-references than online daters looking for a casual relationship.

LIWC and the Word-Based Classifier

To test the hypotheses, we use the program LIWC, perhaps the most commonly used automated text analysis program in the field of language and social psychology (Tausczik & Pennebaker, 2010). The program counts occurrences of specific words in a text, which are taken from list of words that are assigned to different predefined categories related to thought processes, emotional states, and intentions (Pennebaker et al., 2015). The word and category validations by human judgments make LIWC appealing for hypothesis-testing research (Tausczik & Pennebaker, 2010). At the same time, these validated categories are also sometimes perceived as one of the method's limitations (e.g., Schwartz et al., 2013; boyd, 2017). LIWC works with a closed-vocabulary approach and hence not all words in a text necessarily occur on this fixed word list. As a result, words that are characteristic of a particular phenomenon under investigation (like a dating profile text) may be missed. In addition, LIWC categories can be rather broad, with some categories containing over a thousand words (e.g., positive emotion words category). As such, differences between groups of texts on the use of words from these broader categories provide information about underlying psychological constructs of writers, but lack information about the specific words within these categories that discriminate the two text groups, which may complicate interpretation of observed differences by LIWC.

Although studies focusing on language use in dating profile texts have used LIWC (e.g., Toma & Hancock, 2012; Davis & Fingerman, 2016), the lexicon's suitability to the domain has received little

regard. It may be the case that LIWC does not cover the content-specific features that are specifically relevant and common among online dating profile texts. Dating profiles can be rather noisy; they are of informal nature and written by a very diverse population, who do not necessarily adhere to standard language conventions (Van der Zanden et al., 2018). Furthermore, LIWC can provide a wide perspective on structure, tone, and the extent to which psychological processes of intentions are reflected in dating profiles, but reveals little about which content-specific features are particularly distinctive for profile texts of long-term and casual relationship seekers. Perhaps, differences in language use between the two relationship seeking groups manifest themselves not so much in the words captured by the broader LIWC categories, but rather in the use of particular content-specific features, where profile owners may use particular words or word combinations that are considered to be important in a profile text.

In contrast to LIWC, word-based machine learning methods do not rely on a priori word or category judgments but use the texts as linguistic input. Such open-vocabulary methods offer finer-grained methods for profile text analysis, yielding additional insights and more information that leverages findings of closed-vocabulary LIWC analyses (Schwartz et al., 2013). It thereby captures the content-specific features that are specifically relevant within the online dating domain. On the other hand, compared to a text analysis method like LIWC, the output of (word-based) computational approaches is harder to interpret. These computational approaches tend not to explicitly show how underlying psychological constructs, such as personal (relationship) goals, are reflected in language use.

Prior online dating studies using machine learning methods primarily aimed at building recommendation systems, also those that focused on (natural) language in online dating (e.g., Diaz et al., 2010; Akehurst et al., 2011; Tay et al., 2018). One exception is the study of Van Berlo and Ranzini (2018) who used a data-driven word-based classifier approach to investigate how male and female users of Tinder differ from each other in their textual self-presentations, by focusing on their usage of pronouns, nouns, adjectives, and verbs. For instance, they found nouns like “music”, “film”, “friend”, and “student” to occur relatively frequently: men were more likely to mention “film” and women used “student” more often, while neither men nor women were distinctive in their use of “music” and “friend”. The frequencies in which words occur give an indication of what Tinder profile owners prioritize in their self-presentation.

Both LIWC and a data-driven word-based classifier are methods that come with advantages and disadvantages. For that reason, it is beneficial to combine the two computer-based text analysis methods. Previous studies that combined LIWC and a machine learning approach to investigate complex, natural language in online environments have shown that using both methods results in a better explanation for linguistic behavior than when only of the two is used (e.g., Gill et al., 2008;

Paltoglou & Thelwall, 2012; Schwartz et al., 2013). By employing this multi-method approach, the second research goal is addressed: to investigate the extent to which it is valuable to use an open-vocabulary word-based classifier with a closed-vocabulary approach as LIWC for dating profile text analysis. By doing so, it can be investigated which additional content-specific features can be uncovered that differentiate between profile texts written by long-term and casual relationship seekers.

Methods

Corpus

Our sample included 12,310 dating profiles from a popular Dutch dating site, which presents itself as “the dating site for everyone”. The site has more than 75,000 active members of different ages and education levels, as the site explicitly mentions that it is open for everyone. The profile texts for our sample were extracted automatically from the site by means of the free online tool Web Scraper. For anonymity reasons, pictures and user names of profile owners were not collected. The main analyses were performed on an aggregated level, which means that only differences between long-term and casual relationship seekers were examined. Ethical clearance for data collection and text analysis was obtained in 2017 by the Research Ethics and Data Management Committee of Tilburg School of Humanities and Digital Sciences.

When creating a profile on this dating site, members are asked to write a short piece of text in a section called “about myself”, consisting of information about who the profile owner is and the type of partner and relationship they look for. Together with the profile text, the profile owner’s self-reported gender, age, education level, and desired relationship goal were extracted. These were the standard profile characteristics that were directly visible when scrolling through profiles of other site members. Only the first hundred words of each profile text were analyzed as this is what other site users see when initially searching for potential dates or partners. Furthermore, only profiles were included in the sample that had a word count of more than fifty words and were written in Dutch by someone who indicated to live in the Netherlands. Each profile text therefore contained between fifty and hundred words ($M = 80.71$, $SD = 12.99$). Below, an example of an anonymized, translated version of a profile text is presented.

My name is [name] and I live in [place]. I look for a woman with both IQ and EQ. For me it is important that you feel comfortable in your skin and that you know what you want in life. I am a no-nonsense type myself. Also I am a passionate cyclist and I relax the most in my classic car. Moreover, I have my heart on my sleeve but I like it if someone pushes back a bit. Everything with respect for each other. Show who you are by being yourself. That’s what I do too.

Site users can select one of six relationship preferences provided by the dating site when setting up their profile (“I don’t care”, “mail contact”, “friendship”, “date”, “LAT relationship” (i.e., living-apart-together) or “long-term relationship”). For this study, the group of long-term relationship seekers consisted of profile owners who selected “long-term relationship” as the preferred relationship goal ($n = 10,696$). Our casual relationship seeking group contained profiles of those who selected the option “date” as the preferred relationship outcome ($n = 1,614$).

The sample contained only profiles of heterosexuals because the focus of the dating site is primarily on heterosexual singles. The profile owners’ mean age was 42 years and 8 months ($SD = 11.7$) and 64.2% ($n = 7,907$) were men. Profile texts were written by people with different educational backgrounds (lower education: 42.3%, higher education: 57.7%). Lower educated people were the profile owners with a vocational education background and higher educated those who completed higher levels of high school or had a higher professional education or university background. Table 2.1 shows that the long-term and casual relationship seekers were comparable in terms of their self-reported gender, mean age, and level of education.

Table 2.1 Demographic Composition of the Sample for Both Relationship Seeking Groups.

	Gender		Mean age	Education level	
	Men	Women		Low	High
Long-Term	6,773 (63.3%)	3,923 (36.7%)	42.8 (11.83)	4,644 (43.3%)	6,052 (56.6%)
Casual	1,134 (70.3%)	480 (29.7%)	42.2 (11.08)	567 (35.1%)	1,047 (64.9%)
Total	7,907	4,403	42.7 (11.74)	5,211	7,099

Note. This concerns profile owner’s self-reported demographic information.

LIWC

All profile texts from the sample were analyzed by means of LIWC, which calculates the proportions of words related to the different predefined linguistic categories. The Dutch LIWC2015 vocabulary was used, containing more than 13,000 words, in which each word is assigned to one or more categories (Boot et al., 2017; Van Wissen & Boot, 2017). By default, this vocabulary analyzes each text file on 73 established linguistic categories. In this study, the focus is on three sets of categories, with a total of six categories. The first set of categories looked into the use of words related to body and sexuality, and status. Here, the words in the predefined LIWC categories Body and Sexuality were grouped to form one umbrella category. From LIWC’s main category Personal Concerns, the categories Work and Money were merged into one category Status, as potential partners’ careers and incomes are often associated with status in the dating environment. Other sub categories within this main category (i.e., Leisure, Home, Religion, and Death) did not cover word related to status. In these umbrella

categories, words that occurred in more than one of the original LIWC categories were listed only once. The second set gauged the use of positive emotion words and only included the words from the LIWC category Positive Emotions. The third set looked into the use of personal pronouns, in which our focus was on the proportion of I-, You-, and We-references in the profile texts.

Finally, an additional LIWC category was defined by the authors consisting of a list with sixty words related to long-term relational involvement (e.g., “to settle”, “long-term”; see osf.io/wustr/ for the complete list). This category Long-Term Relational Involvement was compiled as a manipulation check to examine whether, compared to casual relationship seekers, profile owners looking for a long-term relationship mention more words related to long-term commitment and involvement.

To test our hypotheses with LIWC, a multivariate analysis of variance (MANOVA) was conducted, with relationship goal as independent variable and six dependent variables, being the proportion of words matching with the words within the six linguistic categories, viz. Body & Sexuality, Status, Positive Emotion Words, I-references, You-references, and We-references.

In order to obtain more information about differences in frequencies of words within the six linguistic categories, a log-likelihood ratio analysis was conducted (Dunning, 1993). This analysis tests whether a word's relative frequency differs significantly for profiles written by people looking for a long-term or casual relationship partner.

Word-Based Classifier

The word-based classifier is based on the classifier approach of Van der Lee and Van den Bosch (2017; see also Aggarwal & Zhai, 2012). Six different machine learning methods are used: linear SVM (support vector machine), Naive Bayes, and four variants of tree-based algorithms (decision tree, random forest, AdaBoost, and XGBoost). In contrast with LIWC, this open-vocabulary approach does not deal with any preassembled word list but uses aspects from the profile texts as direct input and extracts content-specific features (word n-grams) from the texts that are distinctive for either of the two relationship seeking groups.

Two steps were applied to the texts in a preprocessing stage. Most of the stop words from the regular list of Dutch stop words from the Natural Language Toolkit (NLTK), a module for natural language processing, were not considered as content-specific features. Exceptions are the personal pronouns that are part of this list (e.g., “I”, “my”, “you”), because these function words are assumed to play an important role in the context of dating profile texts. The classifier operates on the level of the lemma, meaning that it converts the texts into distinctive lemmas. Lemmatization was performed with Frog (Van den Bosch et al., 2007).

To maximize the chances that the classifier assigned a relationship type to a text based on the investigated content-specific features rather than on the statistical chance that a text is written by a

long-term or casual relationship seeker, two similarly sized samples of profile texts were needed. To do so, 1,614 texts of each relationship group were used: the entire subset of the group of casual relationship seekers' texts and an equally large subset of the 10,696 texts for the long-term relationship seekers. This subset of long-term texts was randomly stratified on gender, age, and level of education based on the distribution of the casual relationship group. Consequently, the baseline chance of the word-based classifier to classify a profile text in the correct relationship group was 50%.

A ten-fold cross validation method was used, meaning that the classifier uses ten times 90 percent of the data to classify the other 10 percent. To obtain a more robust output, it was decided to run this ten-fold cross validation ten times using ten different seeds. To control for text length effects, the word-based classifier used ratio scores to calculate feature importance scores rather than absolute values. These importance scores are also known as Gini importance (Breiman et al., 1984), and are normalized scores that together add up to one. The higher the feature importance score, the more distinctive that feature is for texts of long-term or casual relationship seekers. On github.com/TallChris91/Relationship-goals-in-online-dating-profile-texts-LIWC-Word-based-classifier, the materials used to run the word-based classifier and the LIWC category log-likelihood ratio analysis can be found, including the scripts and the regular stop word list of NLTK with our adaptations of personal pronouns being included.

Results

LIWC

Overall, LIWC recognized 80.9 percent of the words in the profiles ($SD = 6.52$). Profile texts of long-term relationship seekers were on average longer ($M = 81.0$, $SD = 12.9$) than those of casual relationship seekers ($M = 79.2$, $SD = 13.5$), $F(1, 12309) = 26.8$, $p < .001$, $\eta_p^2 = .002$. Other results were not influenced by this word count difference because LIWC operates with proportion scores. In the Appendix at the end of this chapter, more detailed information about other text characteristics of the two relationship seeking groups can be found. Moreover, it was found that long-term relationship seekers use more words related to long-term relational involvement ($M = 1.05$, $SD = 1.43$) than casual relationship seekers ($M = 0.78$, $SD = 1.18$), $F(1, 12309) = 52.5$, $p < .001$, $\eta_p^2 = .004$.

Hypothesis 1 stated that casual relationship seekers would use more words related to the body and sexuality than long-term relationship seekers because of a higher focus on external characteristics and sexual desirability in lower involved relationships. Hypothesis 2 concerned the use of words related to status, where we expected that long-term relationship seekers would use these words more than casual relationship seekers. In contrast with both hypotheses, neither the long-term nor the casual relationship seekers use more words related to the body and sexuality or

status. The data did support Hypothesis 3 that posed that online daters who indicated to look for a long-term relationship partner use more positive emotion words in the profile texts they write than online daters who seek for a casual relationship ($\eta_p^2 = .001$). Hypothesis 4 stated casual relationship seekers use more I-references. It is, however, not the casual but the long-term relationship seeking group that use more I-references in their profile texts ($\eta_p^2 = .002$). Furthermore, the results are not in line with the hypotheses stating that long-term relationship seekers use more you-references because of a higher focus on others (H5) and more we-references to emphasize connection and interdependence (H6): the groups use you- and we-references equally often. Means and standard deviations for the linguistic categories included in the MANOVA are presented in Table 2.2.

Interaction effects of relationship goal and gender were only significant for text length, $F(1, 12306) = 6.49, p = .011, \eta_p^2 = .001$, and the use of I-references, $F(1, 12306) = 7.83, p = .005, \eta_p^2 = .001$. Simple effects analyses showed that men wrote significantly longer texts when looking for a long-term relationship, $F(1, 12306) = 33.33, p < .001$, while for women relationship type sought did not affect profile length, $F(1, 12306) = 0.597, p = .440$. Men and women both use more I-references when seeking a long-term than a casual relationship, but this difference was more pronounced for women than for men (men: $F(1, 12306) = 6.47, p = .011$; women: $F(1, 12306) = 25.46, p < .001$). No significant interaction effect of relationship goal and level of education was found, and results with and without age as covariate were similar. The data used for our LIWC analysis can be found at osf.io/wustr/.

Word-Based Classifier

XGBoost appeared to be the most effective algorithm for the word-based classifier, with an accuracy score of 59.6%, improving accuracy above chance with 9.6%. For both relationship seeking groups, the ten most important content-specific features are provided in Table 2.3, together with their English translations and the importance score for each feature. These features are obtained based on the importance scores given by XGBoost, the best performing tree-based algorithm. Together, all the features given by the classifier add up to one. Only those features with a total frequency score of hundred or more were selected.

Table 2.4 reports the percentages of texts being classified correctly and incorrectly in the group to which it belongs. Profile texts of long-term relationship seekers were more often classified correctly than those of casual relationship seekers, $\chi^2(1) = 4.79, p = .03$. A smaller proportion of long-term texts were incorrectly classified as casual text (38.5%) than vice versa (42.3%).

Table 2.2 Average Proportion Score (SD) for Each Linguistic Category and Relationship Goal.

Linguistic Category	Long-Term	Casual	F^a	p
Body & Sexuality	0.30 (0.70)	0.30 (0.75)	0.040	.854
Status	1.53 (1.29)	1.53 (1.24)	0.027	.869
Positive Emotions	6.26 (3.36)	5.70 (3.19)	39.70*	< .001
I-references	7.33 (3.35)	6.88 (3.36)	25.20*	< .001
You-references	1.76 (1.89)	1.82 (1.99)	1.50	.200
We-references	0.23 (0.33)	0.21 (0.25)	1.64	.220

^aWith for all measures of relationship goal $F(1, 12308)$.

Table 2.3 Top Ten Most Important Content-Specific Features with the Importance Score (IS) Per Relationship Seeking Group.

Long-term			Casual		
Dutch	English	IS	Dutch	English	IS
betrouwbaar	trustworthy	.032	date	date	.087
samen	together	.028	zin	feel like	.017
mijn profiel	my profile	.027	weten	to know	.016
rustig	calm	.026	vrouw	woman	.011
eerlijk	honest	.026	gek	crazy	.010
ik	I	.024	geen	no	.009
dag	day	.023	even	for a while	.009
serieus	serious	.023	eten	to eat	.005
mijn	my	.022	komen	to come	.005
genieten	to enjoy	.022	sturen	to send	.005

Table 2.4 Percentages of Correctly and Incorrectly Classified Texts Based on the Distinctive Content-Specific Features.

True text type	Correctly classified	Incorrectly classified
Long-term	61.5%	38.5%
Casual	57.7%	42.3%

Table 2.5 Top Ten Most Distinctive Words Used Within the LIWC Category Positive Emotion Words with the Log-Likelihood Ratio Score (LLR).

Dutch	English	LLR
graag	would like	24.07**
genieten	to enjoy	20.10**
eerlijk	honest	12.25**
lief	sweet	7.43*
delen	to share	25.97**
heerlijk	lovely	7.14*

Note. Each of these words were most frequently used by long-term relationship seekers. * $p < .01$, ** $p < .001$.

Distinctive LIWC Category Words

An additional log-likelihood ratio analysis was conducted to examine which words that were part of the six LIWC categories were most distinctive for long-term and casual relationship seekers. This log-likelihood ratio analysis calculated whether the relative frequency of a word within a LIWC category was significantly higher in profile texts of long-term or casual relationship seekers, focusing on the three broader LIWC categories Body & Sexuality, Status, and Positive Emotion, with a particular interest for the Positive Emotion category as for this category a significant different LIWC score between the two relationship groups was found. Table 2.5 presents the ten most distinctive words that are part of the Positive Emotion LIWC category in which profile texts of long-term and casual relationship seekers were distinctive. Considering that long-term relationship seekers were more prolific users of positive emotion words, it may not be surprising that the top ten of most distinctive words within this category were all words used more frequently by long-term relationship seekers.

For the other two broader LIWC categories, for which no significant difference in use was found (i.e., Body & Sexuality and Status), relatively few words in that category were found to be distinctive for either of the relationship groups. The few words within the Status word category that were used relatively frequent and which were used significantly more by long-term than by casual relationship seekers were “work”, “job”, and “company”. However, those words in the category Body

& Sexuality that were used significantly more often by long-term or casual relationship seekers occurred so infrequently making interpretation difficult (e.g., “sexy” was used 11 times in the total of 10,969 long-term texts and 9 times in the 1,614 casual texts).

Discussion

The main aim of the current study was to examine whether dating intentions of online daters are reflected in the language use they employ in their dating profiles and, if so, which linguistic elements are important when trying to distinguish between profile texts written by people with two different relationship goals: on the one hand, online daters aiming for a high-involved, long-term relationship, on the other hand, online daters who indicated to look for a casual, lower-involved relationship. This first research goal was addressed by textually analyzing 12,310 existing dating profiles from a dating site.

Two types of analyses were applied to the texts, both operating on word-count basis but pursuing different approaches: LIWC has a top-down approach, in which predefined categories have been manually compiled and validated by scholars, enabling us to set up and test predefined hypotheses. The word-based classifier, on the other hand, uses a data-driven approach, where word n-grams from the profile texts are taken as the linguistic input and provides distinctive content-specific features for both text groups. The secondary goal of this study was to determine to what extent it is effective to add a word-based classifier to LIWC, so far the most commonly used computerized program for profile text analysis.

Linguistic Behavior of Long-Term Relationship Seekers

Results of LIWC indicated that long-term and casual relationship seekers behave linguistically different in their profile texts on some of the linguistic categories investigated: long-term relationship seekers seem to use more positive emotion words and references to the self. Likewise, the word-based classifier provided distinctive content-specific features for the two relationship seeking groups. These content-specific features were relatable to the findings examined by LIWC, especially those extracted from the texts of long-term relationship seekers.

First of all, LIWC showed that long-term relationship seekers use more positive emotion words than casual relationship seekers. Presumably, such positive emotion words are more important to mention when looking for a long-term relationship because they emphasize long-term internal qualities. In addition, words such as “trustworthy”, “honest”, and “serious”, all words distinctive for the texts of long-term relationship seekers, highlight personality traits particularly valued in a long-term relationship partner. For those people looking for a long-term relationship, trust is considered an important factor when determining dating desirability and likelihood of contacting (Wotipka &

High, 2016). Mentioning these words gives an indication of what a profile owner finds important, either as an own personality trait or as a trait sought for in a potential partner (Van Berlo & Ranzini, 2018). Some of these distinctive content-specific features of long-term texts provided by the word-based classifier matched with the words considered distinctive for long-term relationship seekers within the Positive Emotion LIWC category. The log-likelihood ratio analysis presented positive emotion words such as “sweet” and “careful” to be distinctive for long-term relationship texts. This analysis for the words in the Status category also revealed that long-term relationship seekers tend to use the words “work”, “job”, and “company” more often than casual relationship seekers, which can give a tentative indication of long-term relationship seekers valuing resources more in their relationships than casual relationship seekers. Taken together, this suggests that online daters looking for a high-involved, long-term relationship act strategically by emphasizing personal attributes that are (considered to be) important when being involved in a long-term relationship (e.g., Gibbs et al., 2006; Eastwick & Finkel, 2008).

At the same time, profile owner’s language use seems to be affected by the intended relationship goal online daters have in mind, without them being aware of this. LIWC found long-term relationship seekers to use more I-references and also the word-based classifier provided “my (profile)” and “I” as distinctive features for texts of long-term relationship seekers. These findings are not line in with our hypothesis, which stated that casual relationship seekers use more self-references because of higher self-focus and self-involvement. One of the explanations for this contrasting finding may be that using I-references can also be interpreted as a sign of increased levels of self-disclosure, where self-disclosure promotes intimacy and closeness (Laurenceau et al., 1998; Slatcher et al., 2008). Serious relational objectives, such as relationships with higher chances of leading to offline encounters, can affect the type and amount people self-disclose in their self-presentation (Gibbs et al., 2006; Ranzini & Lutz, 2017). Since long-term relationship seekers are more tempted to involve in intimate and close relationships, it may perhaps not be surprising that they self-disclose more by using more I-references. The fact that long-term relationship seekers wrote on average longer profile texts supports the assumption that long-term relationship seekers engage in higher levels of self-disclosure, by being more honest, providing more personal information, and making more conscious and intentional disclosures to others online (Gibbs et al., 2006; Toma & Hancock, 2011). Casual relationship seekers are in general considered to be more impersonal and have a lower need to invest in others, which may lead them to disclose less information about themselves and asking for less information about others (Gibbs et al., 2006; Toma & Hancock, 2011). Higher levels of self-disclosure may help as a mean to reduce uncertainty, with people who believe there will be future (offline) contact relying more heavily on more information and reduced uncertainty (Gibbs et al., 2006).

Taken together, results of both LIWC and the word-based classifier seem to imply that during the profile writing process, long-term relationship seekers' linguistic behavior is affected both consciously and unconsciously. On the one hand, long-term relationship seekers consciously mention topics and internal characteristics and qualities that become more important over the long-term. On the other hand, they are distinctive in their use of I-references, pronouns that are automatically produced. Conscious and unconscious processes affecting language use in parallel corresponds with earlier indications in Toma and Hancock's study (2012) on deceptive linguistic behavior. They argued that lying profile owners make strategic decisions about what topics to mention, by using more work- and achievement-related words to emphasize more truthful aspects of themselves, but also use fewer self-references and more negations because of an unconscious process of psychological distancing from the deceptive behavior.

Linguistic Behavior of Casual Relationship Seekers

All findings discussed so far concerned profile texts of long-term relationship seekers. It is, however, much more challenging to get a grip on the content of profile texts written by casual relationship seekers. Identifying patterns among the distinctive features provided by the word-based classifier for texts of casual relationship seekers was fairly difficult. This raises the question what casual relationship seekers do write about in their profiles, as they seem to contain less self-disclosing and personal information. Presumably, profile texts of casual relationship seekers have less in common and are more diffuse. Their profiles may be less in-depth and remain more on the surface. Perhaps, the fact that casual relationship seekers do not necessarily have long-term perspectives, makes them less motivated to self-disclose.

The word-based classifier has shown that it was harder to classify the texts of casual relationship seekers than those of long-term relationship seekers. This corresponds with the earlier indication that profile texts of casual relationship seekers share less commonalities and are more diffuse. In addition to that, when looking at the texts of profile owners with casual relationship goals, it appears that fewer of these distinctive content-specific features are important for explaining the variance between the two groups of texts, compared to texts written by those looking for a long-term relationship partner. To illustrate, "to send," the tenth most important distinctive feature for the texts of casual relationship seekers had an importance score of 0.005, compared to 0.022 for the tenth word "to enjoy" for the long-term relationship texts. This indicates that relatively few words were meaningful to classify casual texts as such, with the exception of the word "date", with an importance score of 0.087.

LIWC and the Word-Based Classifier

The second goal of this study was to determine what a data-driven word-based classifier would add to LIWC when analyzing dating profile texts. Both classification methods deal differently with linguistic input and use other vocabulary approaches; the word-based classifier uses an open-vocabulary and LIWC a closed-vocabulary approach. In our study, we see two main advantages of adding a word-based classifier to the LIWC analysis. First, the classifier finds words relevant within the domain of online dating that do not occur in the predefined LIWC word list. In our case, four from the twenty content-specific features provided by the word-based classifier in Table 2.3 were not part of the LIWC dictionary (i.e., “date”, “feel like”, “(my) profile”, “serious” (adjective)). This shows, that although the word list of LIWC seems to capture most of the content-specific features that distinguishes texts of casual and long-term relationship seekers, some important distinctive content-specific features were uncovered by the classifier. Second, while LIWC offered a broader perspective, reflective of underlying psychological processes that may have influenced profile owners’ language use, the word-based classifier zoomed in more specifically on the content-specific features within a category that may be important to indicate differences between profile texts of the two relationship seeking groups. For example, as LIWC showed long-term relationship seekers to use more positive emotion words, a category that contains a vast amount of words all related to positive emotions, the word-based classifier identified the content-specific features that may play an important part within this broad category of positive emotions (i.e., “trustworthy” and “honest”).

The size of the word lists in some LIWC categories makes it difficult to interpret differences between two groups of texts. Therefore, an additional log-likelihood ratio analysis was conducted, which examined which words within the LIWC categories were used significantly more by long-term or casual relationship seekers. This analysis showed comparable results with the distinctive content-specific features provided by the word-based classifier, particularly for the long-term relationship seeking group. Some words that were distinctive for long-term relationship seekers within the Positive Emotion category were the same as the distinctive content-specific features of long-term relationship seekers provided by the word-based classifier (“to enjoy”, “honest”, “calm”, and “trustworthy”). This indicates that similar words may have driven linguistic differences between the two relationship groups within this LIWC category as for the word-based classifier. Positive emotion words that were distinctive for casual relationship texts within this category (e.g., “adventurous”, “festivals”, and “adventure”) can be an indication of their more casual attitude toward dating and relationships, and can be associated with distinctive content-specific features like “date”, “feel like”, and “to eat” provided by the word-based classifier. While there is a considerable degree of overlap between the distinctive LIWC category words and the content-specific features of the word-based

classifier for the long-term relationship seekers, this is not the case for the other group of texts. This can imply that positive emotion words are not the words through which casual relationship seekers distinguish themselves from long-term relationship seekers. This corresponds with the relatively low frequency scores of these distinctive positive emotion words (e.g., “adventurous” and “festival” occurred respectively 50 and 34 times in casual relationship texts). Moreover, that long-term and casual relationship seekers showed minimal differences in use of words within the LIWC categories Body & Sexuality and Status corresponds with the fact that no body, sexuality, and status words were part of the content-specific feature list of the word-based classifier. Overall, results of the two methods reveal similar patterns, with these patterns being more pronounced in texts of long-term relationship seekers than in those of people looking for a more casual relationship.

Suggestions for Future Work

Although most profile owners follow dating sites’ guidelines and hold on to emerged conventions among profile owners, there are still many different ways of constructing a profile text. It may therefore not be surprising that the effect sizes are rather small and that the classifier predicts accurately only around 10% above chance. Our results are observed on the basis of a large collection of dating profiles and although there seem to be indications of linguistic differences between the two groups of texts, we cannot make strong claims about the extent to which an online dater’s relationship goal can be immediately derived from a linguistic analysis of this person’s profile text. The use of a specific textual element is not restricted to only one relationship type category: texts of casual relationship seekers do contain features distinctive for texts of long-term relationship seekers and vice versa. To examine whether individuals are able to identify profile owners’ relationship goals based on the profile texts that are written, a more experimental, controlled experiment should be conducted with human judges.

Moreover, it would be interesting to investigate what combination of linguistic and other (visual) cues in dating profiles affect online daters’ behaviors and what combination of cues are effective to achieve the intended relationship goal. As the current corpus did not include any information about the number of contact messages in response to each dating profile, it was impossible to investigate the profiles’ success and effectiveness. However, it would be interesting to include this, so as to examine how the way profile owners textually present themselves plays a role in establishing desired romantic relationships. In addition, follow-up research could further examine the collocations with which particular words occur to provide how and in what context these words are more likely to be used (e.g., “I” from a self-centered or self-disclosing perspective or “honest” as an own personality trait or a desired trait in a partner). A next step could then be to investigate whether linguistic differences between relationship seeking groups can also be observed at

propositional, sentence, or text levels, for example, in verb argument constructions, question and declarative sentence constructions, and topics that are mentioned. With a better understanding of preferences of online daters who seek either a long-term or casual relationship, it could be possible for profile owners to increase chances of finding the intended relationship partner by adjusting the profile (texts) based on the relationship goal.

Conclusion

Results of LIWC and the word-based classifier in this study suggest that relationship goals can leave linguistic traces in the textual component of the dating profile, including both strategic linguistic cues as well as unconsciously leaked cues. As far as we are aware, this is the first study which shows that online dating profile owners differ in how they linguistically present themselves dependent on the type of relationship sought. Although the present study shows that intentions and relationship goals of online daters can affect language use in dating profiles, additional empirical work is necessary to shed better light on the effects of writers' intentions and goals on linguistic behavior.

Appendix

Text Characteristics of Profile Texts of Long-Term and Casual Relationship Seekers.

Text Characteristic	Long-Term	Casual	Total
Total number of profile texts	10,696	1,614	12,310
Average number of words in profile text	80.95 (12.87)	79.15 (13.5)	80.71 (12.97)
Average percentage of words recognized by LIWC	81.06 (6.40)	80.13 (7.22)	80.9 (6.52)
Average number of sentences in profile text	5.66 (2.23)	5.56 (2.21)	5.64 (2.23)
Average number of words in sentence	16.75 (11.50)	16.25 (10.36)	16.68 (11.36)
Average word length	4.41 (2.50)	4.45 (2.54)	4.41 (2.50)
Total number of types	31,157	11,141	34,429
Total number of tokens	86,5541	12,8074	993,615
Type-token-ratio	0.036	0.087	0.035

Note. Numbers in brackets indicate standard deviations.

3

Effects of Different Language Error Types and Picture Visibility on Impression Formation

This chapter is based on:

Van der Zanden, T., Schouten, A., Mos, M., & Kraemer, E. (2020). Impression formation on online dating sites: Effects of language errors in profile texts on perceptions of profile owners' attractiveness. *Journal of Social and Personal Relationships*, *37*, 758-778.

Abstract

This article presents two experimental studies investigating the impact of language errors in online dating profiles on impression formation. A first study examined whether language errors have a negative effect on perceptions of attractiveness and dating intention and whether this effect is moderated by the presence of visual information, that is, the profile picture. This 2 (Language Errors/No Language Errors) × 2 (Visible/Blurred Picture) experiment revealed that language errors negatively affect perceptions of social and romantic attractiveness and that a visible picture on a profile positively affects perceptions of physical attractiveness. Study 2 focused on mechanical, rule-based, and informal language errors, which can each be attributed to different personality traits. Mechanical and rule-based errors lead to lower scores on, respectively, perceived attentiveness and intelligence, which in turn lead to lower attractiveness and dating intention scores. These results highlight the importance of error-free language use as a cue for attractiveness.

Keywords: dating profiles; impression formation; language errors; language use; online dating; profile picture

Introduction

Forming an accurate impression of someone's attractiveness and romantic potential is paramount in the initial stages of online dating. To form these impressions about others, people use whatever cues are available to reduce uncertainty (Hancock & Dunham, 2001). In online dating, people form first impressions based on the cues that are available on the dating profile. Usually, such a profile consists of both pictures and a textual description of the profile owner, and both have been shown to shape daters' impressions of overall attractiveness and romantic appeal (Fiore et al., 2008).

Earlier research has highlighted the importance of profile pictures in dating profiles on attractiveness (e.g., Hitsch et al., 2010; Whitty, 2008), while the effect of the profile text on attractiveness perceptions has been relatively understudied. The textual component, though, may be especially relevant in forming impressions because it does not only contain cues that people intentionally construct but also contain cues that people unintentionally give off (Ellison et al., 2006). Examples of such unintentional cues are language errors, typographic characteristics (Lea & Spears, 1992; Walther & D'Addario, 2001), message length (Donath, 1999), and last login date (Ellison et al., 2006). Such cues have high warranting value because they are provided unintentionally and may therefore be useful for obtaining a more accurate impression of the profile owner's actual self (Walther & Parks, 2002; Wotipka & High, 2016). Regarding dating profile texts, such implicit cues are considered to be equally or even more important for impression formation than the explicit content due to their high warranting value (Ellison et al., 2006).

Language errors may be one such cue that is given off and therefore have high warranting value. Language errors convey information that can strongly affect impressions and can help to make inferences about the profile owner (Ellison et al., 2006; Sharabi & Dykstra-DeVette, 2019). Research on written texts in other online environments, such as housemate e-mail advertisements (Queen & Boland, 2015), direct mail letters (Kloet et al., 2003), and product feedback comments (Stiff, 2012), has shown that in general texts with language errors are rated more negative than texts without errors. Moreover, these studies have shown that errors negatively affect perceptions about others' cognitive and intellectual abilities, level of education, or attentiveness. Different types of language errors could affect these perceptions differently. For example, whereas mechanical language errors (e.g., typographical errors) tend to be associated with writers' attentiveness and lack of interest, rule-based errors (e.g., grammatical and spelling errors) are attributed to writers' competence and intelligence (Kreiner et al., 2002; Queen & Boland, 2015).

Thus far, the effect of language errors on impression formation has not been investigated in an online dating context and particularly not in a naturalistic online dating context with a large sample of actual dating site users. Since most online daters search for a partner who is intelligent,

attentive, and warm (Ellison et al., 2006; Whitty, 2008), it is likely that they use cues tied to these attributes to develop impressions. Although online daters indicate that cues given off, such as language errors, are important for impression formation (Ellison et al., 2006), little online dating research has focused on how such unintentional cues affect impression formation. To that end, this article presents two studies in which dating site users read fictitious dating profiles with and without language errors and then rate profile owners' attractiveness.

The goal of the first study is to determine whether language errors in online dating profile texts affect perceptions of attractiveness and dating intention. The profile picture and profile text being the two most important components people use in impression formation (Fiore et al., 2008), this study investigates to what extent (a) language errors in dating profiles affect perceptions of the profile owners' attractiveness and (b) whether these effects persist when visual cues in the form of profile pictures are added to the available cues on the profile.

The goal of the second study is to gain a better understanding in how different types of language errors may affect impression formation. Different language error types can be tied to different personality attributions (e.g., Kloet et al., 2003; Kreiner et al., 2002; Queen & Boland, 2015). Perceptions of these attributions could, in turn, affect a profile owner's perceived attractiveness. In a second study, we therefore investigate the extent to which mechanical, rule-based, and informal language errors affect a profile owner's attractiveness and whether perceptions of attentiveness, intelligence, and warmth mediate the relationship between language error type and perceptions of attractiveness and dating intention.

Study 1: Effects of Language Errors and Profile Picture Visibility

On dating profiles, a limited number of cues are available to form impressions about a potential romantic partner, especially compared to the number of cues available during traditional face-to-face dating (Rosen et al., 2008). In situations with reduced cues, people try to gather enough social information to be able to form reasoned impressions (Sharabi & Dykstra-DeVette, 2019). According to the uncertainty reduction theory (URT; Berger & Calabrese, 1975), people have an aversion against uncertainty and try to reduce uncertainty by using all available cues to acquire enough information. One of the uncertainty reduction strategies online daters employ, is to seek out cues that give off unintended information in addition to cues that are consciously employed to self-present (e.g., Gibbs et al., 2011; Wotipka & High, 2016). Since cues given off are more likely to convey information about the profile owner's actual self, the warranting value of such cues is high (Walther & Parks, 2002). The higher the warranting value of a cue, the higher the impact of this cue on impression formation.

As language errors are likely to be made unintentionally, they may constitute cues with high warranting value and are therefore useful to reduce uncertainty and form impressions. Following language expectancy theory (Burgoon & Miller, 1985), people develop expected norms as to what language use is appropriate in a specific context. In the context of online dating, even though online language use is considered to be a rather informal genre, dating profiles without language errors are still the norm and so expected (Ellison et al., 2006).

When language expectations are violated in a text, this often results in negative perceptions and attitudes towards the text, the writer of the text, and the writer's expected cognitive abilities and work ethics (e.g., Figueredo & Varnhagen, 2005; Kloet et al., 2003; Stiff, 2012). For example, a study of Queen and Boland (2015) in which participants evaluated short email responses to a housemate advertisement with or without language errors, showed that errors negatively affected readers' evaluations about the writer's academic and social skills. A reason for this negative effect is that people associate errors with negative attributes, such as writers being inattentive, clumsy, or ignorant. A qualitative study by Ellison et al. (2006), based on telephonic interviews, revealed that online daters perceive language errors in profiles as negative, as it can be indicative of a lack of education or interest in putting time and effort in constructing a profile (text). These negative attributes associated with errors are, in turn, interpreted as important signals that may influence perceptions of attractiveness. We therefore pose the following hypothesis:

H1. Profile owners with dating profile texts that contain language errors are rated lower on attractiveness and dating intention than profile owners with profile texts without language errors.

Language errors may especially play a role in impression formation when other impression formation cues are absent. Social information processing theory (SIP; Walther, 1992) argues that, in the absence of specific cues that people normally use to form impressions of each other, people turn to the cues that *are* available and rely on those cues more heavily. Previous research has shown that visual cues, or more specifically profile pictures, influence users' perceptions of the profile owner to a large extent (Fiore et al., 2008). When visual information about a profile owner's physical appearance is hidden, people's focus may shift to other profile components and they have to use these cues to form impressions. This has prompted several dating platforms to initially show dating profiles without pictures or with blurred pictures.¹ In cases of unrevealed pictures, online daters are likely to be more attentive to and rely more on errors in profile texts when forming impressions, which can amplify their negative perceptions about the profile owner. We therefore pose the following hypothesis:

H2. The negative effect of language errors in dating profile texts on attractiveness perceptions and dating intention is stronger when a profile includes a blurred picture than when a profile includes a visible picture.

Method

Ethical clearance for data collection was obtained in fall 2018 by the Research Ethics and Data Management Committee of Tilburg School of Humanities and Digital Sciences. To support transparency, rigor, and reproducibility in science (Nosek et al., 2018), this study was preregistered on OSF. The research design, hypotheses, and analysis plan can be found at: osf.io/w64mu/registrations.²

Participants

To collect data, we collaborated with Parship, one of the largest online dating sites in the Netherlands, for which everyone can sign up. On this dating site, it is customary that profiles initially show only blurred pictures. Once site users agree upon mutual interest, they are able to unblur and reveal their pictures to each other. Parship assisted by recruiting participants via an e-mail that was sent to all members who had been active on the site the last three months. Participation was on a voluntary basis. Parship was not involved in any further aspects of the study, such as the experimental setup or study outcomes.

Participants who indicated being bisexual or did not want to disclose their sexual preference could not be assigned to a condition and were therefore excluded from participation. Only data from those who completed the entire experiment were included for analyses, which resulted in a total of 373 participants. All participants were 18 years or older ($M = 55.6$, $SD = 11.5$) and were native speakers of Dutch. From those participants, 52.5% indicated to be men, 66.7% had a college degree, and the other 33.3% had a vocational or high school level degree. The participants in this study were mostly older adults, while anyone over 18 can become a Parship member. Our sample may therefore not perfectly mirror the site's overall user demographic.

At the end of the experiment, participants were asked to indicate whether they noticed language errors in the two profiles they had been presented with. From the 373 participants, 125 (33.5%) reported to have noticed errors, while 248 (66.5%) indicated not to have noticed errors or were not sure.

Design and Procedure

The experiment had a 2×2 design, with language errors (language errors/no language errors) as within-subject variable and profile picture (visible/blurred picture) as between-subject variable. Participants were presented with profiles that matched their indicated sexual preference, that is,

male or female profiles with corresponding pictures and textual references (“love of his/her life”). Figure 3.1 presents two examples of original profiles in Dutch that were part of the experimental material presented to the participants (i.e., profiles (a) and (c)) and translations of the profile texts in English (i.e., profiles (b) and (d)).

The experiment was conducted online and took approximately five minutes to complete. First, participants were welcomed, informed, and gave informed consent. Then, some demographic questions were answered and participants were randomly assigned to the visible or blurred profile picture condition. Subsequently, they were presented with a fictitious profile, either with or without language errors, and with a blurred or a visible picture dependent on the assigned picture condition. To assess how well participants examined the profiles, they answered two questions about each profile’s content. These were followed by their ratings on the dependent variables. After the first profile, participants were presented with a second dating profile, with a randomly different profile text, now in the other error condition (i.e., if they had first seen a profile without errors, they now would see one with errors and vice versa), and the same procedure was followed.

To make sure physical attractiveness of profile owners would not influence overall participants’ perceived attractiveness too strongly in the main study, a pretest was conducted to identify pictures of two moderately attractive men and women to use in the main experiment. If physical attractiveness of the profile owner would be too extreme (either too high or low), this could obscure any effects of language use. Ten pictures depicting a man and ten depicting a woman, ranging in expected attractiveness, were preselected from a free stock image site. All photos were free to use and licensed under creative commons. None of the 107 participants who took part in the pretest (47.7% men) participated in the main study. Participants scored the physical attractiveness of the depicted people of their preferred sex on a 10-point scale. The two pictures of men and women rated around the median (i.e., those rated as fifth and sixth in terms of physical attractiveness) were selected for the profiles in the main experiment. The same four pictures were blurred for the blurred picture condition.

The four profile texts constructed for this study differed in content, each containing seven or eight sentences and ranging between 92 words and 101 words. The texts were based on existing profiles (Van der Zanden et al., 2018) and were kept relatively neutral to avoid that participants would be too repelled or attracted by specific interests, such as a preference for death metal music or being vegan. Except for one gender-specific word (e.g., “woman”, “his”), the texts were identical in content for men and women.

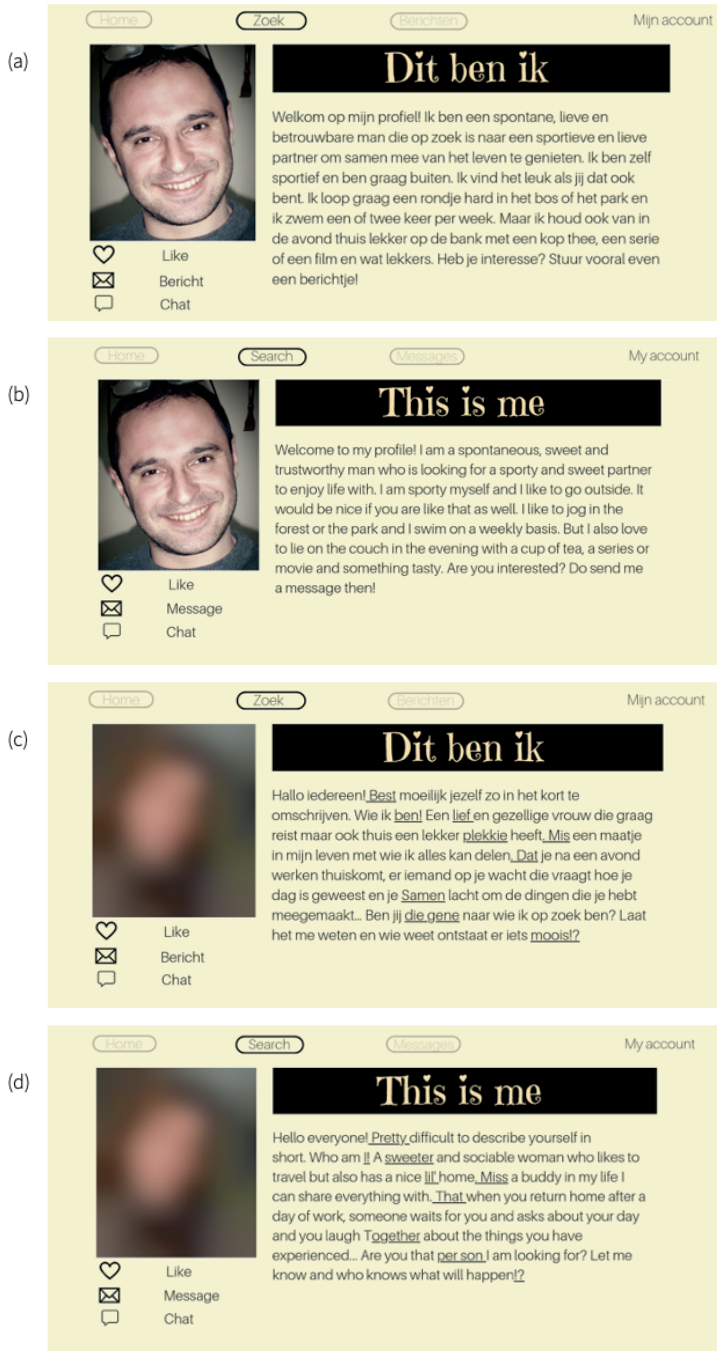


Figure 3.1 Examples of the original Dutch dating profiles used for the experiment (a, c) and translated English versions (b, d). Profiles (a) and (b) are male profiles with a visible picture and without language errors, and profiles (c) and (d) are female profiles with a blurred picture and with language errors.

Note. Language errors are underlined here, but not in the profiles presented to participants.

In the language error condition, the texts contained ten errors that were evenly distributed throughout the text and reflected the proportional use of different types of errors observed in a corpus analysis with authentic profile texts (Van der Zanden et al., 2018). Examples of sentences with language errors included in the texts are (translated from Dutch, errors underlined here for clarity reasons): “I just feel like I want to fall love again” (typographical error) or “That you laugh Together about the things you experienced” (capital letter error). A pretest with 89 participants (not part of the main study sample; 38.2% men) showed that language errors did affect participants’ perceptions of text quality. On a scale from 1 to 10, the quality of profile texts with errors was graded lower ($M = 5.48$, $SD = 1.50$) than the quality of those without errors ($M = 6.84$, $SD = 1.48$), $F(1, 88) = 64.76$, $p < .001$, $\eta_p^2 = .42$. All materials used for this study are available in OSF, at osf.io/w64mu/.

Measures

All six dependent variables were measured on a scale from 1 (*completely disagree*) to 7 (*completely agree*). The used items were predominantly derived from existing scales, with the wording translated and slightly adjusted to fit our experiment.

Perceived attractiveness of the profile owner was measured by four determinants: physical attractiveness, social attractiveness (McCroskey & McCain, 1974), romantic attractiveness (Campbell, 1999), and dating intention. Example items include “I think this person is good-looking” for physical attractiveness, “I think this person and I could be friends” for social attractiveness, “I would not want to have a relationship with this person” (reverse-coded) for romantic attractiveness, and “I would like to know more about this person” for dating intention. The nine items of attractiveness formed a two-dimensional scale with social and romantic attractiveness as one factor with a Cronbach’s α of .82, and physical attractiveness as the other (Cronbach’s $\alpha = .92$). The three items of dating intention were considered as one factor (Cronbach’s $\alpha = .87$).

Analysis

To analyze the data, linear mixed-effect models were conducted in SPSS. The individual profile assessments served as the unit of analysis. As each participant assessed two profiles, there were two cases for each participant. To control for the nonindependence between cases, participants were treated as a random factor in the design.³ Fixed factors were language error presence and profile picture visibility and the outcome variables the ratings on social-romantic attractiveness, physical attractiveness, and dating intention. Whether the questions about the text’s content were answered correctly or incorrectly was included as a covariate. The denominator degrees of freedom are obtained by a Satterthwaite approximation. The data of this study are available on OSF, at: osf.io/w64mu/.

Results

The means and standard deviations for language error presence and picture visibility on all three dependent variables can be found in Table 3.1.

Profile owners with profile texts with language errors ($M = 4.29, SD = 1.12$) are rated as less socially and romantically attractive than profile owners with texts without errors ($M = 4.45, SD = 1.12$), $F(1, 370.27) = 5.15, p = .024, d = .15$. No main effects of errors on physical attractiveness, $F(1, 372.16) = 0.37, p = .543$, and dating intention, $F(1, 371.12) = 3.72, p = .054$, were obtained. Results show that H1, stating that profile owners with errors in profile texts would be rated lower on perceived attractiveness and dating intention than profile owners without errors in their profiles, was confirmed for social-romantic attractiveness, but not for physical attractiveness and dating intention.

A main effect of picture visibility on physical attractiveness, $F(1, 371.23) = 48.83, p < .001, d = .56$, showed that profile owners with visible pictures ($M = 4.71, SD = 1.34$) are perceived as physically more attractive than those with blurred pictures ($M = 4.06, SD = 0.96$). For social-romantic attractiveness and dating intention, no main effect of picture visibility was found (with both F 's < 0.83 and p 's $> .364$).

For none of the three dependent variables, any significant interaction effects of language errors and profile picture visibility were found, with F 's < 3.04 and p 's $> .08$.⁴ This means that H2 was not confirmed, as the negative effect of errors on perceived attractiveness and dating intention was not stronger when a profile includes a blurred picture than when it includes a visible picture.

Because only a third of the participants indicated to have noticed errors in the profiles, we also ran linear mixed-effect models with those who noticed the errors versus those who did not, added as an extra fixed factor. There was a significant interaction effect of language errors and error noticing for social-romantic attractiveness, $F(1, 370.65) = 11.85, p = .001$. Pairwise comparisons using least significant difference (LSD) adjustments showed that participants who noticed errors in the profiles gave lower social-romantic attractiveness scores when a profile included errors ($M = 3.91, SD = 1.15$) than when it was free of errors ($M = 4.43, SD = 1.27$), $F(1, 370.81) = 17.15, p < .001, d = .43$, while participants who did not notice them or were not sure gave similar social-romantic attractiveness scores to profile owners with ($M = 4.47, SD = 1.05$) and without errors ($M = 4.46, SD = 1.04$) in their profiles, $F(1, 369.90) = 0.01, p = .912$.

Table 3.1 Mean Scores (SD) for All Variables per Condition in Study 1.

	Visible profile picture (<i>n</i> = 352)		Blurred profile picture (<i>n</i> = 360)	
	Language errors	No language errors	Language errors	No language errors
Social-romantic attractiveness	4.34 (1.17)	4.48 (1.17)	4.23 (1.05)	4.43 (1.06)
Physical attractiveness	4.62 (1.39)	4.80 (1.29)	4.10 (1.01)	4.01 (0.90)
Intention to date	4.26 (1.60)	4.42 (1.59)	4.30 (1.56)	4.52 (1.44)

Note: Perception scores could range from 1 (negative attitude) to 7 (positive attitude).

While the interaction effect of language error condition and error noticing was not significant for physical attractiveness, it was for dating intention, $F(1, 371.47) = 11.51, p = .001$. Pairwise comparisons showed a similar pattern for dating intention as for social-romantic attractiveness. Participants who noticed errors gave lower dating intention scores to profile owners with errors ($M = 3.77, SD = 1.61$) than to those without errors ($M = 4.42, SD = 1.60$) in their texts, $F(1, 371.63) = 15.26, p < .001, d = .40$, while participants who did not notice them or were not sure gave similar dating intention scores to profile owners with ($M = 4.54, SD = 1.50$) and without errors ($M = 4.49, SD = 1.48$), $F(1, 370.74) = 0.13, p = .722$.

Conclusion Study 1

The first study investigated whether language errors in a profile text negatively affect daters' perceptions about the profile owner's attractiveness and their intention to date the profile owner. Our findings reveal that profile owners with profile texts containing errors were evaluated as less socially and romantically attractive by participants than profile owners without errors in their profiles. Further analyses showed that this effect was caused solely by the one third of participants who noticed the errors. Apparently, most people do not observe language errors in online dating profiles, but for those who do, the errors severely damage the profile owner's dating potential.

With regard to attraction and dating intention, we expected to find interaction effects of language errors and profile picture visibility. It was hypothesized that the negative effect of errors would be stronger when a profile contains a blurred picture than when it contains a visible picture. In contrast to H2, no interaction effects were found for both dimensions of attractiveness nor for dating intention. The lack of visual information does not increase attentiveness to and importance of textual cues. Results did show that profile owners with visible pictures are perceived as physically more attractive than those with blurred pictures, whereas profile picture visibility did not affect ratings on social-romantic attractiveness and dating intention. It seems to be the case that language errors and

picture visibility influence separate dimensions of attractiveness (i.e., social-romantic and physical attractiveness, respectively), which explains the absence of any interaction effects.

Study 1 showed that, overall, language errors negatively affect perceptions of social-romantic attractiveness, regardless of the profile picture's visibility. However, in this study, we adhered to a formal definition of language errors, that is, anything that violated conventions on standard, formal written Dutch. This results in profiles containing a broad range of rather diverse language errors that reflect the wide error distribution of authentic dating profiles (Van der Zanden et al., 2018). The variation of errors in the experimental materials of Study 1 gives little insight into whether particular types of errors affect impression formation differently. Earlier research has suggested that this might be the case (e.g., Kreiner et al., 2002; Queen & Boland, 2015).

Study 2: Effects of Different Language Error Types

To obtain a clearer understanding on how language errors affect impression formation, a second study was conducted, in which we manipulated specific types of errors and investigated their effects on perceived attractiveness and dating intention. This study focused on three language error types: mechanical, rule-based, and informal language errors. All errors included in the profiles of Study 2 correspond with one particular error type. By constructing profile texts that each contained only one error type, it could be determined whether particular personality attributions that are associated with certain error types mediate the relationship between language error type and perceptions of attractiveness and dating intention.

When making mechanical language errors, writers mistake as a result of a mechanical problem, such as writing “teh” for “the”. It is assumed that people who make mechanical errors are cognizant with the correct rule, but did not apply this rule correctly at the moment of writing. Such errors are often perceived as a signal of sloppiness, clumsiness, and inattentiveness (e.g., Kreiner et al., 2002; Lea & Spears, 1992). In the case of online dating, inattentiveness can be interpreted as a lack of effort and interest in putting time and effort in constructing a dating profile, which is subsequently likely to be perceived as unattractive. Therefore, we pose the following hypothesis:

H3. Mechanical language errors in profile texts negatively affect perceptions of profile owners' attentiveness which, in turn, negatively affect perceptions of attraction and dating intention.

Writers make rule-based language errors when they are ignorant of the correct form or spelling convention. This implies one is likely to be unable to correct an incorrect form when the text is reread. Rule-based errors can violate syntactic constraints, leading to grammatical errors, such as

using the incorrect personal pronoun “me” instead of “I” in “My friends and me often go out”, but can also violate lexical constraints, resulting in a spelling error (e.g., writing “intellegent” for “intelligent”). The assumption that the writer is ignorant of the correct form or rule is likely to negatively affect readers’ perceptions of writers’ intellectual abilities and competence, especially when it comes to strangers (Vignovic & Thompson, 2010). Intelligence and competence, in turn, are important determinants when assessing the attractiveness of a potential partner (Regan et al., 2000).

H4. Rule-based language errors in profile texts negatively affect perceptions of profile owners’ intelligence which, in turn, negatively affect perceptions of attraction and dating intention.

Informal language errors are incorrect when following the strict rules of formal written standard language, but may not be directly perceived as incorrect on computer-mediated communication (CMC) platforms. Examples are usage of emoticons (e.g., “:-D”), abbreviations (e.g., “w8”), and expressive punctuation (e.g., “hello!!!!”). These cues are mostly used to compensate for the lack of paralinguistic and prosodic cues in CMC, enhancing the richness of a written text (Hård af Segerstad, 2002). Writers can strategically decide to make such informal errors, as it adds meta-communicative meaning to texts, helps people to express themselves, and can enhance feelings of spontaneity, directness, and intimacy. In addition, informal errors can regulate the reader’s interpretation and can provide signals about a writer’s character, disposition, and attitude (Huffaker & Calvert, 2005). We therefore hypothesize:

H5. Informal language errors in profile texts positively affect perceptions of profile owners’ warmth which, in turn, positively affect perceptions of attraction and dating intention.

Method

This study’s preregistration can be found at: osf.io/7gkju/registrations.

Participants

Recruitment of participants was similar to Study 1; 365 other members of the Dutch dating site Parship participated voluntarily. The distribution of participant’s self-indicated gender (48.2% men), education level (68.8% college degree), and $M_{age} = 54.6$ years ($SD = 12.2$) was comparable to Study 1. From all participants of this study, 221 (60.5%) indicated to have noticed language errors, while 144 (39.5%) did not or did not know.

Design and Procedure

Since the results of Study 1 showed that errors affect perceived attractiveness regardless of the profile picture's visibility, only language errors were manipulated in Study 2, while the picture was kept constant. Only blurred pictures were used in this study, being the same as those used in Study 1. Starting from the same four profile texts used in the first study, four versions of each text were made that differed in the type of errors they contained: eight mechanical errors ("spotaneous", "in short:~"), eight rule-based errors ("your self," "intrested"), eight informal errors (":-D," "w8"), or no errors (control). Each of the three language error types corresponded with one or more categories of a coding scheme used in a corpus analysis on language errors in existing dating profiles (Van der Zanden et al., 2018).

Study 2 followed the same procedure as Study 1, with the same general instruction, demographic questions, content-related questions, and again the question whether they noticed errors in the profiles or not. Similar to Study 1, each participant assessed two profiles consecutively. First, the participant was shown one of the four profile texts in one of the four conditions. Next, the participant was presented with one of the other profile texts, this time in another condition. Again, the individual profiles served as the unit of analysis, so each participant contributed two cases to the dataset.

To check whether texts with mechanical, rule-based, and informal errors were perceived as less attentively written, more ignorant, and more informal than those without errors, a pretest was performed with 29 people (not part of the main study; 34.5% men). They rated four texts with different language error types on their attentiveness, ignorance, and informality on a 7-point scale. Results showed that compared with profiles without errors, profiles with mechanical errors were rated as less attentively written, profiles with rule-based errors as more ignorant, and texts with informal errors as more informal, with for all t 's (28) > 7.42 and p 's < .001. Moreover, a one-way analysis of variance (ANOVA) indicated that for all four conditions profile text content did not affect ratings on attentiveness, ignorance, and informality, all F 's (3, 28) < 2.24 and p 's > .11.

Participants in the pretest were then asked to identify and categorize the errors in the text, by selecting and categorizing the incorrect word (group) or punctuation in one of the three language error types. In 73.4% of the cases, the errors included by the authors were also identified as errors by participants. From those identified errors, 84.1% were categorized in the intended language error type. Based on these pretest findings, some minor adaptations were made in the texts used for the main study.

Measures

To measure attractiveness and dating intention, the same 12 statements were used in Study 2 as in Study 1. Again a factor analysis showed that the nine items of attractiveness form the same two factors: social-romantic attractiveness and physical attractiveness (Cronbach's $\alpha = .85$ and $.90$, respectively). The scale reliability of date intention was also good, with a Cronbach's α of $.88$.

In addition, participants answered three items with regard to the perceived attentiveness of the profile owner (based on the work of Janssen & Jansen, 2016), for example: "I think this person is attentive." These items formed a one-dimensional scale (Cronbach's $\alpha = .81$). Perceived intelligence was measured by means of three items (based on the work of Leach et al., 2007), such as "I think this person is intelligent" (Cronbach's $\alpha = .80$). In addition, there were three items about the profile owner's perceived warmth, which together formed one factor with a Cronbach's α of $.71$. An example of an item of perceived warmth is "I think this person is friendly."

Analysis

To test our hypotheses, mediation analyses were conducted (Preacher & Hayes, 2008). Language error type was the independent variable with four levels: mechanical, rule-based, informal, and no language errors. Each error type was compared to the control condition of no errors. Perceived attractiveness and dating intention were the dependent variables; attentiveness, intelligence, and warmth were the mediators, and the score on the content-related questions was the covariate. We used a bootstrapping approach with 10,000 samples and bias-corrected and accelerated (BCa) bootstrap intervals. The materials and data of this study are available in OSF, at osf.io/7gkju/.

Results

Before conducting mediation analyses, a one-way ANOVA revealed a main effect of language error type on social-romantic attractiveness, $F(3, 729) = 12.38, p < .001$. Planned contrast analyses with no language errors as the baseline contrasted with each of the three error types separately showed that when a text was free of errors, participants gave higher social-romantic attractiveness scores than when a text contained mechanical, rule-based, or informal errors, with for all $t(726) > 3.62, p \leq .001$, and $d > .36$. For physical attractiveness, no significant main effect of language error type was found, $F(3, 729) = 0.86, p = .462$.

The main effect of language error type on dating intention was significant, $F(3, 729) = 11.66, p < .001$. When a profile was free of errors, participants gave higher dating intention scores than when a text contained mechanical, rule-based, or informal errors, with for all $t(726) > 3.65, p < .001$, and $d > .38$. In addition, results showed differences between language error types on perceived attentiveness, $F(3, 729) = 18.74, p < .001$, and intelligence, $F(3, 729) = 22.87, p < .001$, but not on

warmth, $F(3, 729) = 2.20, p = .087$.⁵ Table 3.2 presents for each language error type the mean scores on all dependent and mediating variables.

Results indicated that mechanical errors in profiles are a significant predictor of perceived attentiveness, $b = -.72, SE = .11, p < .001$. Attentiveness fully mediated the relationship between mechanical errors and perceived social-romantic attractiveness, $b = -.38, SE = .06$, BCa CI: [-0.513, -0.266], physical attractiveness, $b = -.22, SE = .05$, BCa CI: [-0.324, -0.138], and dating intention, $b = -.49, SE = .08$, BCa CI: [-0.656, -0.331]. After controlling for the mediator attentiveness, mechanical errors are no longer a significant predictor of social-romantic attractiveness, $b = -.03, SE = .11, p = .777$, and dating intention, $b = -.13, SE = .16, p = .402$. The direct effect of mechanical errors on physical attractiveness was still significant after controlling for perceived attentiveness, $b = .21, SE = .11, p = .046$. The data confirm H3 stating that mechanical errors negatively affect perceptions of attentiveness which then negatively affect attractiveness and dating intention perceptions.

Rule-based language errors are a significant predictor of lower intelligence perceptions, $b = -.92, SE = .11, p < .001$. The occurrence of rule-based errors was thereby a significant predictor of social-romantic attractiveness, $b = -.61, SE = .08$, BCa CI: [-0.787, -0.453]; physical attractiveness, $b = -.36, SE = .06$, BCa CI: [-0.497, -0.241]; and dating intention, $b = -.88, SE = .12$, BCa CI: [-1.108, -0.650], when mediated by intelligence. This supports the hypothesis that perceived intelligence mediates the relationship between rule-based errors and perceived attractiveness and dating intention (H4). After controlling for intelligence, rule-based errors were no longer a significant predictor of social-romantic attractiveness, $b = -.14, SE = .10, p = .169$, and dating intention, $b = -.11, SE = .14, p = .427$, indicating full mediation. Results for physical attractiveness point at partial mediation, as the direct effect of rule-based errors was significant even after controlling for intelligence, $b = .20, SE = .10, p = .046$.

Table 3.2 Means (SD) for All Variables for Each Language Error Type in Study 2.

	No (<i>n</i> = 180)	Mechanical (<i>n</i> = 177)	Rule-based (<i>n</i> = 179)	Informal (<i>n</i> = 194)
Social-romantic attractiveness	4.51 (1.02)	4.09 (1.29)	3.75 (1.15)	4.06 (1.25)
Physical attractiveness	4.00 (0.92)	3.99 (1.08)	3.85 (0.98)	3.95 (0.95)
Intention to date	4.58 (1.44)	3.95 (1.71)	3.59 (1.63)	3.97 (1.63)
Attentiveness	4.39 (0.81)	3.66 (1.27)	3.72 (1.17)	4.14 (1.04)
Intelligence	4.43 (0.95)	3.85 (1.12)	3.52 (1.11)	4.08 (1.11)
Warmth	5.03 (0.86)	4.85 (0.91)	4.80 (0.90)	4.89 (0.93)

Note: Perception scores could range from 1 (negative attitude) to 7 (positive attitude).

H5 posed that informal errors in profiles positively affect perceptions of profile owners' warmth which, in turn, positively affect perceptions of attractiveness and dating intentions. However, informal errors did not significantly affect perceptions of warmth, $b = -.14$, $SE = .09$, $p = .132$. Warmth did not mediate the relationship between informal errors and physical attractiveness, $b = -.05$, $SE = .04$, BCa CI: [-0.123, 0.015], and dating intentions, $b = -.10$, $SE = .07$, BCa CI: [-0.241, 0.031], but did for social-romantic attractiveness, $b = -.10$, $SE = .06$, BCa CI: [-0.224, -0.028]. After controlling for warmth, the effect of informal errors on social-romantic attractiveness, $b = -.35$, $SE = .10$, $p < .001$, was still significant, indicating partial mediation (see Figure 3.2).

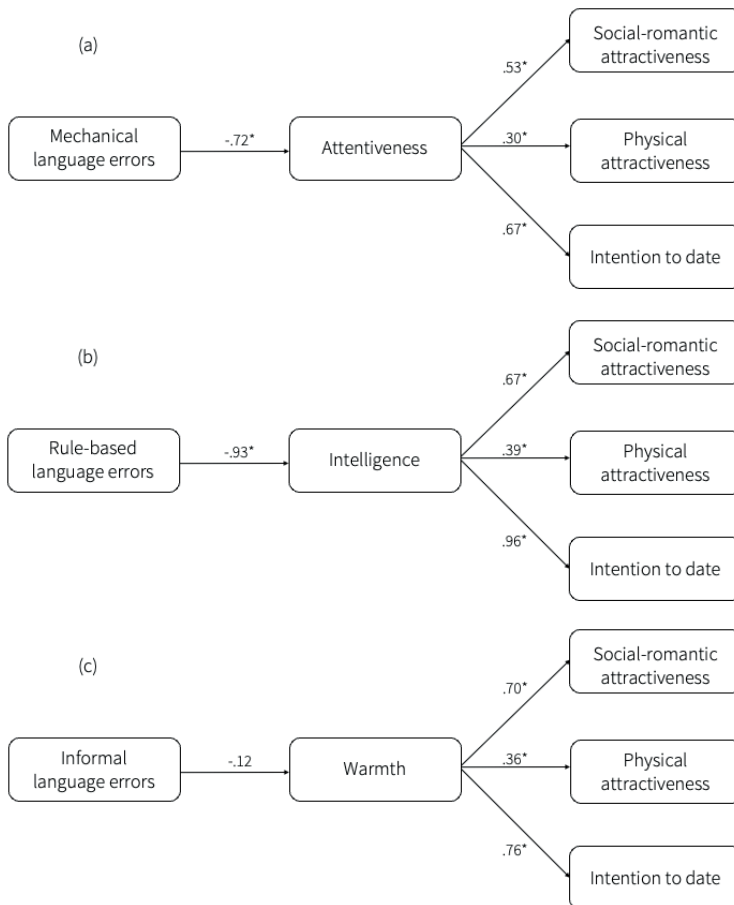


Figure 3.2 Results of the three mediation analyses displaying (a) perceived attentiveness mediating the effect of mechanical language errors, (b) intelligence mediating the effect of rule-based language errors, and (c) warmth not mediating the effect of informal language errors on all three dependent variables. The coefficients represent the unstandardized coefficients.

Note. * $p < .001$.

Additional exploratory analyses of variances were conducted, in which whether participants noticed errors or not was considered as another fixed factor. Only for rule-based errors, interaction effects between errors type and error noticing were found for social-romantic attractiveness, $F(1, 354) = 15.13, p < .001$, and dating intention, $F(1, 354) = 15.79, p < .001$, but not for physical attractiveness. Pairwise comparisons with LSD adjustments showed that participants who noticed errors gave lower scores on social-romantic attractiveness when a text included rule-based errors ($M = 3.49, SD = 1.18$) than when it was free of errors ($M = 4.52, SD = 1.06$), $F(1, 354) = 47.54, p < .001, d = .92$. Those who noticed errors also gave lower dating intention scores to profile owners with rule-based errors ($M = 3.19, SD = 1.60$) than to those without errors ($M = 4.54, SD = 1.51$), $F(1, 354) = 42.52, p < .001, d = .87$. Similar to what we found in Study 1, for those who indicated not to have seen any language errors or did not know, there were no differences on ratings of social-romantic attractiveness and dating intention between language error conditions, with both F 's < 0.361 and $p > .549$.

Conclusion Study 2

The aim of Study 2 was to examine whether different types of language errors affect impression formation differently. To do so, three language error types were distinguished: mechanical, rule-based, and informal errors. Each of the three types was expected to be associated with a particular personality attribution that would then mediate perceptions of attractiveness and dating intention.

H3 and H4 were supported, as the results showed that mechanical errors were perceived as a signal of inattentiveness, with lower attentiveness scores when a text contained mechanical errors than when it was error-free. Lower attentiveness scores resulted in lower scores on perceived social-romantic and physical attractiveness, as well as on dating intention. Rule-based errors lead to lower scores on perceived intelligence which, in turn, lead to lower scores on attractiveness and dating intention.

In H5, we focused on informal language errors. The expectation was that, in contrast with mechanical and rule-based errors, informal errors would positively affect attractiveness as mediated by a positive effect of these errors on warmth. This hypothesis was not supported: Warmth partially mediated the relationship between informal errors and attractiveness but in the opposite direction than expected. Profile owners with informal errors in their profiles are seen as less warm than those without errors, resulting in lower attractiveness perceptions. However, as the mediation is weak, with the main effect of informal errors on warmth not being significant, there seems to be little effect of informal language use on attractiveness perceptions.

General Discussion

The two studies reported in this article focused on whether and how language errors in dating profiles affect the impressions online dating site users form of profile owners. Although online daters have mentioned language errors to be a letdown in the dating process (Ellison et al., 2006), this had not yet been empirically addressed. We conducted two experimental studies in which dating site users were presented with made-up dating profiles with or without language errors and rated profile owners' social-romantic and physical attractiveness, as well as their intention to date the profile owner.

Results of both studies suggest that errors in profiles negatively affect impressions people form of profile owners. First, Study 1 showed that, overall, language errors negatively affect perceptions of social-romantic attraction, confirming H1. People devote attention to language errors as a cue regardless of whether the profile picture was visible or blurred. This effect was not stronger for profiles with a blurred picture than with a visible one (contra H2). Results from Study 1 also showed a main effect of profile picture visibility: Visible pictures led to higher ratings of physical attractiveness than blurred pictures. A possible explanation is that people withhold their judgment of physical attractiveness when they cannot observe someone's appearance. In the blurred conditions, physical appearance hovered around the midpoint of the scale, while the scores were higher when profile pictures were visible.

Study 2 confirmed the results of Study 1 and showed that perceived attractiveness and dating intention perceptions were mediated by particular attributes tied to different language error types. Mechanical errors lead to lower attractiveness and dating intention scores as mediated by lower attentiveness scores, while perceived intelligence mediated the relationship between rule-based errors and attractiveness and dating intention scores, supporting H3 and H4. Contrary to our H5, results showed that writers of profiles with informal language errors were rated less positively than writers of profiles without errors (cf. Scott et al., 2014). It seems that even though making informal errors can be a decision made consciously to come across warm, people perceive such errors in a similar manner as errors made unintentionally (i.e., mechanical and rule-based errors).

Additional analyses suggested that the overall negative effect of errors may be driven by the subset of participants who indicated to have noticed errors in the profiles they read. In both studies, participants who did not notice errors or were not sure did not seem to be affected by the errors, as their attractiveness perceptions were similar for profile owners with and without errors in their texts. The interaction effect of error noticing and rule-based errors in Study 2 indicate that primarily those who noticed errors were negatively affected by the rule-based error type, while this was not necessarily the case for profiles with mechanical or informal errors. Taken together, it seems that not

all individuals are attentive to language errors. However, for those who do notice errors, perceptions of attentiveness, intelligence, and attractiveness were severely dampened.

Our results may have several theoretical implications for research into online impression formation. First, this study has shown that language errors have relatively high warranting value and serve as an important cue to impression formation, such as about a person's social-romantic attractiveness and personality traits. These findings support warranting theory, which supposes that cues that are less prone to manipulation have the strongest impact on impression formation (Walther & Parks, 2002). Self-generated cues, such as the profile text, are seen as cues with low warranting value. However, our research shows that people are aware that self-constructed texts can also contain cues that people unintentionally give off, such as language errors, and that people use those cues to form impressions. This accords with findings of Wotipka and High (2016) who showed warranting content (e.g., college attendance details, friend network references) in a dating profile increases impressions of trust.

Second, our results showed that textual and visual cues in dating profiles affected different dimensions of perceived attractiveness. That is, language errors lead to lower scores on social-romantic but not on physical attractiveness, while profile pictures affected perceived physical but not social-romantic attractiveness. As such, impressions on one dimension of attractiveness do not simply seem to spill over into other dimensions. Our hypotheses did not posit different potential cue effects for separate aspects of attractiveness, as we based these on the SIP, which poses people form impressions of others based on the cues that are available (Walther, 1992). However, SIP is not specific about which cues affect which dimensions of attractiveness, instead expecting uniform effects on impression formation (McCroskey & McCain, 1974). According to this theory, to form impressions about, say, physical appearance, people fill in the blanks using other cues in the absence of visual cues. Based on our findings, though, it seems that people are specific about which cues they use to form impressions and need different cues in the profile that fit specific dimensions of impression formation. Inferences about physical attractiveness seem to be made based on information from the profile picture, and characteristics of the texts are likely to affect impressions of a profile owner's social-romantic attractiveness. Future research could investigate which cues in online impression formation are tied to specific dimensions of attractiveness. Moreover, research could test if spill-over effects exist where impressions formed on one dimension also affect other aspects of impression formation.

Third, our research shows that language errors seem to be used as a meaningful indicator for obtaining insights into a profile owner's personality, such as about one's attentiveness and intelligence. These attributions then affect perceptions of social-romantic attractiveness and dating intention. Also previous research in other (online) environments demonstrated that language errors

are used as a cue to make inferences about a writer's personality (e.g., Kreiner et al., 2002; Queen & Boland, 2015). Our findings do corroborate SIP and show that people indeed use whatever cues at their disposal to form impression about others, not only concerning attractiveness but also concerning their personality.

Finally, we would like to point out two possible limitations. First, effect sizes in our study were all somewhere between small and medium. This shows that language errors are but one of the cues that people pay attention to when forming impressions. However, considering the other available cues that language errors compete with, such as profile text content and profile picture, the observed effects of errors on impression formation are not trivial, especially for those who noticed them. Second, the fact that many people did not notice or did not know whether they had been presented with profiles with errors (Study 1: 66.5%, Study 2: 39.5%) raises the question which individuals are prone to notice language errors. While the present study focused on how textual characteristics of dating profiles (i.e., language errors) can influence perceptions of readers, an interesting next step would be to investigate which reader characteristics affect which cues are used for impression formation.

Concluding, our results show that language errors affect impressions of online dating profile owners. Language errors are likely to be seen as a cue that is unintentionally given off and therefore affect perceptions of personality, which in turn affect perceived attractiveness. In general, our research supports that the textual component of an online dating profile is important for impression formation. Future research should further determine which and how other (linguistic) cues in dating profiles influence impression formation, such as the order in which topics in a profile are mentioned, usage of dialect, or word and sentence complexity.

Footnotes

¹ Examples of online dating platforms that do not immediately present a person's picture are dating sites Parship and PersonalityMatch and dating applications Taffy, Willow, and Twine.

² In the preregistration of Study 1, another hypothesis was posed considering the main effect of profile picture visibility on perceptions of attractiveness and dating intention. As the main focus of this study was on the effects of language errors on impression formation, this hypothesis was not integrated in the chapter to retain the chapter's focus and flow. However, the effects of picture visibility on the dependent variables are discussed in the Results section of Study 1.

³ The results presented are based on the model with participants included as random factor. To see whether comparing effects for the four different profile texts and pictures led to better model fit, we ran additional models with text and picture as random effects. For each dependent variable, the critical value for the χ^2 distribution was < 3.84 ($p > .05$, $df = 1$). Adding these random factors to the model did not result in significantly better models and were thus not included in the final model used for analysis.

⁴ As mentioned in the preregistration of Study 1, we had two other dependent variables, both consisting of three items: attributional confidence (Clatterbuck, 1979) and perceived text warmth (based on Janssen & Jansen, 2016). Both formed a one-dimensional scale (attributional confidence, Cronbach's $\alpha = .70$; text warmth, Cronbach's $\alpha = .78$). No main or interaction effects of picture visibility and language error presence were found on these two variables, with F 's < 1.54 and p 's $> .215$. In addition, gender and age did not interact with the other fixed factors of the model on any of the dependent variables.

⁵ For Study 2, gender interacted with language error type for social-romantic attractiveness and dating intention, with for both $F(3, 718) > 3.56$ and $p < .018$. For both dependent variables, pairwise comparisons showed that women were more negatively affected by mechanical errors than men, with for both $F(1, 718) > 23.17$ and $p < .001$. As in Study 1, analyses with and without age as covariate led to similar results.

4

Effects of Picture Attractiveness and Language Errors on Information Processing and Impression Formation

This chapter is based on:

Van der Zanden, T., Mos, M., Schouten, A., & Krahmer, E. (2021). What People Look at in Multimodal Online Dating Profiles: How Pictorial and Textual Cues Affect Impression Formation. *Communication Research*. Advance online publication.

Abstract

This study investigates how online dating profiles, consisting of both pictures and texts, are visually processed, and how both components affect impression formation. The attractiveness of the profile picture was varied systematically, and texts either included language errors or not. By collecting eye tracking and perception data, we investigated whether picture attractiveness determines attention to the profile text and if the text plays a secondary role. Eye tracking results revealed that pictures are more likely to attract initial attention and that more attractive pictures receive more attention. Texts received attention regardless of the picture's attractiveness. Moreover, perception data showed that both the pictorial and textual cues affect impression formation, but that they affect different dimensions of perceived attractiveness differently. Based on our results, a new multimodal information processing model is proposed, which suggests that pictures and texts are processed independently and lead to separate assessments of cue attractiveness before impression formation.

Keywords: online dating; eye tracking; impression formation; interpersonal attraction; dating profiles; profile picture attractiveness; language errors

Introduction

Cues in both pictures and texts on online dating profiles can affect the impressions people form of the owner of the profile. For instance, profile owners with attractive pictures score higher on perceived physical attractiveness and dating desirability than those with unattractive pictures (e.g., Fiore et al., 2008; McGloin & Denes, 2018), but score lower on authenticity (Lo et al., 2013). Regarding dating profile texts, language errors (Chapter 3), low self-described ambition (Sritharan et al., 2010), and providing highly selective positive information (Wotipka & High, 2016) have been shown to negatively impact perceptions of a profile owner's attractiveness, likeability, and dating desirability.

When searching for romantic potential, the single most important determinant is the other person's physical attractiveness (e.g., Hitsch et al., 2010; Toma & Hancock, 2010). In multimodal dating profiles, this information can mainly be derived from a profile picture. Previous research into initial impression formation has shown that based on pictorial information, people rapidly, intuitively, and effortlessly form impressions about physical attractiveness and use this information to infer personality traits (e.g., Dion et al., 1972; Miller, 1970; Olson & Marshuetz, 2005; Willis & Todorov, 2006). With regard to impression formation in online dating settings, this implies that information from the profile picture automatically leads to an initial impression, after which people could either stick to this impression without much more deliberation or process other available information on the profile more deliberately, such as the profile text. These two ways of processing a multimodal dating profile may be likened to the two processing modes proposed by prevalent dual information processing theories as elaboration likelihood model (ELM; Petty & Cacioppo, 1986) and heuristic-systematic model (HSM; Chaiken, 1980, 1987).

A profile picture may thus function as the profile's gatekeeper, with the profile owner's physical attractiveness determining whether there is need for additional information processing from the profile text. The ambiguity of picture information is likely to play a role here: extreme cues with little ambiguity, such as highly attractive or unattractive pictures, oftentimes result in an immediate and (rather) consistent impression about this person (e.g., Miller, 1970; Willis & Todorov, 2006). Picture information will then often be sufficient for impression formation and there may therefore be little need for more information from the profile text. On the other hand, ambiguous pictures, such as those that are neither attractive nor unattractive (i.e., moderately attractive), may not provide enough information to form an impression. To compensate for this, people can develop this impression by being more attentive to the profile text and using the cues within this text.

Previous research on the effects of pictorial and textual cues on impression formation focused primarily on the outcomes of impression formation processes (e.g., Chapter 3; Fiore et al., 2008; Lo et

al., 2013). While inferences can be made about how attentive people are to profile pictures and texts based on these studies, little is known about how attention is actually allocated to these profile components to establish these impressions, and how profile cues affect information processing. An effective way of investigating attention allocation and information processing regarding dating profiles is by means of eye tracking. Eye movement behavior can provide information about which profile component attracts initial and most attention (e.g., Scott & Hand, 2016; Seidman & Miller, 2013 on Facebook profiles), and can shed light on how cues in profile components affect information processing.

The main goal of this study is to investigate how pictures and texts on online dating profiles are visually processed. More specifically, we examine the potential of the profile picture—and its attractiveness—as the profile’s gatekeeper, by investigating (a) whether profile picture attractiveness influences text processing, as measured by frequency and duration of fixations, and (b) whether profile picture attractiveness influences the extent to which textual cues (here language errors) affect impression formation, as measured by ratings on perceived attraction. To do so, participants viewed multimodal dating profiles which comprise a picture that scores high, moderate, or low on physical attractiveness and a text with or without language errors, and rated the profile owners in terms of perceived attraction.

Processing and Assessing Profile Cues

Pictures often immediately evoke a spontaneous affective response, especially since attractiveness cues are highly salient (Olson & Marshuetz, 2005; Willis & Todorov, 2006). With only a few glances at a picture, people can already gather information ranging from, for example, age, ethnicity, and eye color to physical attractiveness. Without much effort or awareness, information about physical attractiveness can lead to fast, intuitive, and unreflective impressions on other dimensions of attractiveness and personality traits (Locher et al., 1993; Willis & Todorov, 2006). The valence (positive or negative) of the impression about a person’s physical attractiveness is usually consistent with impressions regarding other characteristics of that person. For example, physically attractive people are also perceived as more likeable, trustworthy, careful, and confident, and unattractive people as insensitive, less trustworthy, and more aggressive (Dion et al., 1972; Miller, 1970; Willis & Todorov, 2006).

Picture information is not only easily accessible to form a quick initial impression, but also carries a great impression formation weight. A visual primacy effect is found before, emphasizing the importance of profile pictures over profile texts when forming impressions about Facebook profile owners (D’Angelo et al., 2014; Van der Heide et al., 2012). Pictures carry more weight in the final

assessment (e.g., Fiore et al., 2008) and are also more likely to attract initial attention (Scott & Hand, 2016; Seidman & Miller, 2013). In addition to providing important information about profile owners' looks, pictures are an easy "point of entry" (Scott & Hand, 2016). In particular, pictorial information is arguably less densely packed than textual information, which suggests that more information can be decoded per fixation on a picture than on a text (Rayner et al., 2001). Taken together, this indicates that it is more efficient for people to first focus on pictorial rather than textual information when being presented with multimodal dating profiles, and we therefore pose:

H1. When viewing online dating profiles, containing a profile picture and text, people first fixate on the profile picture rather than on the profile text.

While profile pictures are likely to attract initial attention regardless of the person's beauty, the physical attractiveness of a depicted person presumably determines the frequency and duration of the fixations on the picture. Both how often and how long people look at a component can signify which information resources are processed and receive cognitive attention (Rayner, 1998; Scott & Hand, 2016). Studies have shown that beauty captures attention: the more attractive the face, the more and longer people look at it (e.g., Langlois et al., 2000; Leder et al., 2016; Maner et al., 2003; Valuch et al., 2015). In previous studies, eye tracking has been used as a method to demonstrate that gazing varied as a function of physical attractiveness. Particularly within the field of psychology, various eye tracking studies have shown that people tend to look longer at attractive individuals on pictures (Leder et al., 2010, 2016; Maner et al., 2003; Mitrovic et al., 2016) and in (offline) dating contexts (Van Straaten et al., 2010), but also in a social media context where other (non-pictorial) information was available on profiles (Seidman & Miller, 2013).

This bias of gazing at attractive individuals appears to be functional. In relationships, people want to maximize their outputs. In deciding the rewards that people may derive from others, physical attractiveness is one of the most important factors (Dion et al., 1972; Walster et al., 1973). Following this line of research, it is expected that on online dating profiles the attractiveness of a profile picture similarly determines how often and long people look at the picture. This leads to the following hypothesis:

H2. The more attractive the profile picture on an online dating profile, the more and longer people fixate on this profile picture.

When being exposed to attractive or unattractive pictures of potential partners on dating profiles, people form initial impressions about physical attractiveness based on intuitive reactions (Sritharan et al., 2010). The “what is beautiful is good” stereotype poses that physical attractiveness fosters positive attributions about other personality traits that are (socially) desirable (Dion et al., 1972). Considering this stereotype, it is likely that an initial impression based on physical attractiveness is extrapolated to an overall impression about the profile owner: a positive impression of a physically attractive profile owner and a negative impression of a profile owner with an unattractive picture.

In an online dating context, Sritharan et al. (2010) previously examined how intuitive heuristic responses to profile pictures affected assessments of other social information, in their study, profile text information. They conducted two studies among female participants who viewed and rated online dating profiles containing an attractive or unattractive picture and a text with high or low self-described ambition—with high ambition being more attractive than low ambition. They found that only picture attractiveness affected spontaneous affective responses, as measured in an affective priming task, whereas both picture attractiveness and self-described ambition influenced reported scores on likeability. More specifically, text evaluations varied as a function of spontaneous picture evaluations: for both profiles with high and low self-described ambition, likeability scores were higher when an attractive picture evoked a positive spontaneous response than when a negative spontaneous response was evoked by an unattractive picture (Sritharan et al., 2010). These results indicate that the attractiveness-related initial impressions influenced likeability impressions based on profile text attractiveness.

Once an overall initial impression about a profile owner has been formed based on picture attractiveness, people may or may not proceed to put more effort in processing other available profile information, such as the profile text. If the initial impression about physical attractiveness is strongly valenced, that is: very positive or very negative, little further information processing may be needed, because physical attractiveness is such a strong determinant of perceived attractiveness in (online) dating. After all, people are willing to date highly attractive others anyways (Walster et al., 1966), whereas profile owners with unattractive pictures will presumably be excluded as potential partners based on the picture information that has been evaluated first (Fiore et al., 2008).

This implies that a profile owner’s physical attractiveness, as depicted in the profile picture, may function as a “gatekeeper” to the rest of the profile: picture attractiveness can determine to what extent profile texts receive attention in addition to the profile picture. This not to say that people will not look at the profile text at all when seeing an attractive or unattractive picture, but that relatively less attention will be paid to the profile texts. We expect people to process the text more heuristically, as the picture provides enough information to form an impression of the profile owner’s

attractiveness, diminishing the need for further information processing (Chaiken, 1980, 1987; Petty & Cacioppo, 1986). The schematic representation of this picture gatekeeper model is presented in Figure 4.1, and here (a) illustrates the extreme case in which the positive and negative impressions formed based on attractive or unattractive pictures, respectively, immediately lead to perceptions on all three dimensions of attractiveness, with no attention paid to the profile text.¹

When a person is moderately attractive, information about physical attractiveness remains ambiguous in a picture. Therefore, heuristic processing of the profile may not be possible, as a profile owner can neither be immediately accepted (in the case of an attractive picture) nor rejected (unattractive picture) as a potential romantic partner. In such cases, mental shortcuts or stereotypes may not be applicable. People may consequently seek for additional information to form an impression. In the case of multimodal online dating profiles, this could mean shifting attention from the profile picture to the profile text. Therefore, we pose that when a profile picture provides ambiguous information about physical attractiveness (i.e., when the profile owner is moderately attractive), more systematic (central) processing will take place, resulting in more attention to textual information than when the initial impression is unambiguous (i.e., when the picture is either attractive or unattractive). In this latter case, more heuristic (peripheral) processing of the profile will take place, resulting in less profile text attention. Path (b) in Figure 4.1 illustrates this alternative route for profiles with moderately attractive pictures compared to that of profiles with attractive and unattractive pictures. We thus hypothesize:²

H3. People fixate more often and longer on the profile text when a moderately attractive picture is shown on the online dating profile than when the profile contains an (a) attractive or (b) unattractive profile picture.

Our picture gatekeeper model, as depicted in Figure 4.1, is compatible with prevalent models of dual information processing, such as the elaboration likelihood model (ELM; Petty & Cacioppo, 1986) and heuristic-systematic model (HSM; Chaiken, 1980, 1987), in that it proposes an automatic and a more deliberate information processing route. Our model has, however, been formulated specifically to describe how information on multimodal online dating profiles is processed automatically and systematically, whereas ELM and HSM were introduced in the context of persuasion and have later been applied to general information processing. Notice, incidentally, that while information in pictures can be processed more quickly and holistically, and text processing requires more time and effort (e.g., Barry, 1997; Chaiken & Eagly, 1976), there is no necessary one-on-one link between pictorial information and automatic processing on the one hand, and textual

information and deliberate processing on the other hand in theories about dual information processing.

The gatekeeping function of the picture makes it likely that people will not only be more attentive to textual cues when pictorial cues are ambiguous, but will also rely on those cues more heavily to accrue an impression of a profile owner with a moderately attractive picture (Tidwell & Walther, 2002). It is expected that people extend the initial positive or negative impression for profiles with attractive or unattractive pictures to impressions on other dimensions of attractiveness, such as about the person’s social attractiveness, which indicates people’s desires to spend time with someone (McCroskey & McCain, 1974), and romantic attractiveness, that is, how much people feel romantically attracted to someone (Campbell, 1999). This overall impression of attractiveness is then presumably not amplified by attractive or unattractive textual cues in a profile. However, if picture information is ambiguous, people may be more prone to cues that could help them come to an overall impression. Therefore, cues in texts accompanied by moderately attractive profile pictures may carry more impression formation weight compared to the same textual cues in profiles with attractive or unattractive pictures.

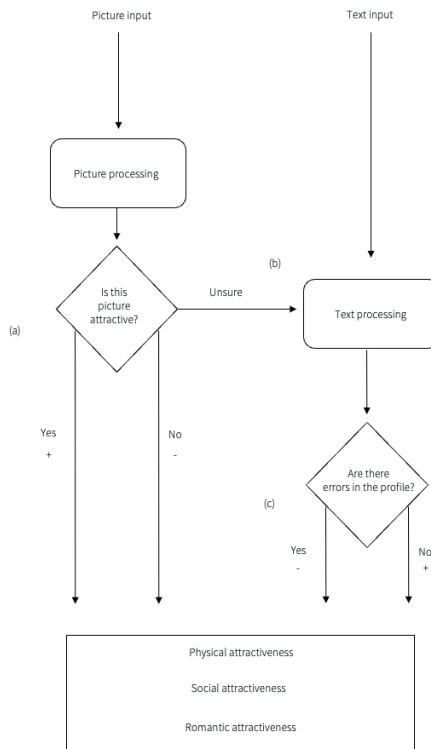


Figure 4.1 Schematic representation of the picture gatekeeper model.

To test this in this study, we manipulate language errors in the profile texts. Language errors have been shown to negatively affect perceptions of attractiveness, especially perceived social and romantic attractiveness (Chapter 3). Path (c) in Figure 4.1 shows how for profiles with moderately attractive pictures, the absence or presence of language errors may affect perceived attractiveness, where the presence of language errors has a negative effect and the absence has a positive effect. This leads to the following hypothesis:

H4. Language errors in a profile text negatively affect perceptions of profile owners' attractiveness more strongly when a profile picture on an online dating profile is moderately attractive than when a profile picture is attractive or unattractive.

Method

Before data collection, ethical clearance was obtained in Spring 2019 by the Research Ethics and Data Management Committee of Tilburg School of Humanities and Digital Sciences. On OSF, the research design, hypotheses, and analysis plan were preregistered: osf.io/cbtv2/registrations.

Participants

In this study, 57 undergraduate students participated, who earned credits for their participation. Due to technical difficulties and calibration problems, data of 48 participants could be included for analyses. All participants had normal or corrected to normal vision, were native speakers of Dutch and were between 18 and 27 years old ($M = 21.4$ years, $SD = 2.34$; 67.2% women).

Design and Material

This experiment had a 3×2 design, with both profile picture attractiveness (attractive/ moderately attractive/unattractive picture) and language errors (language errors/no language errors) as within-subject variables. Participants were exposed to all conditions, and were presented with a total of 18 dating profiles, three from each condition. We thus aimed for a total of 864 cases, that is, 48 (participants) \times 18 (dating profiles). However, due to technical issues 33 observations are missing, resulting in a total of 831 cases. All dating profiles consisted of a picture and text, and whether a participant saw profiles of males or females was determined by asking the participants what gender they feel most attracted to.

Profile Pictures

For both profiles of males and females, 18 pictures were selected: six attractive, six moderately attractive, and six unattractive pictures. Which pictures belonged to each of the three categories was

determined with a pretest, in which 85 participants ($M_{\text{age}} = 26.7$ years, $SD_{\text{age}} = 5.47$, 68.2% women) rated the physical attractiveness of 50 depicted individuals of their indicated preferred sex on a ten-point scale. The pictures, which were preselected from free stock image sites (e.g., PXXhere, Flickr, Pexels) and were licensed under creative commons, ranged in expected physical attractiveness. Any potential confounding picture variables that could affect perceptions of picture attractiveness other than the depicted person's physical attractiveness were avoided. The set of pictures was homogenous in terms of characteristics and demographics, and matched with the presumed demographics of the participants (e.g., age, ethnicity). All people were frontally depicted with head and shoulders, looked friendly into the camera, and did not depict characteristics that may repel or attract participants immediately, such as regarding clothing style, piercings, or tattoos.

Scores for the 50 male pictures were between 1.58 and 6.77 with an average score of 3.62 ($SD = 1.67$) and the 50 female pictures scored between 2.15 and 8.04 with an average score of 4.96 ($SD = 1.67$). For both sets of pictures, the six pictures that scored highest were selected as the attractive pictures (male pictures: $M = 6.18$, $SD = 1.94$, $Mdn = 7.00$; female pictures: $M = 7.46$, $SD = 1.30$, $Mdn = 8.00$), and the six that scored lowest were categorized as the unattractive pictures (male pictures: $M = 1.83$, $SD = 1.02$, $Mdn = 2.00$; female pictures: $M = 2.51$, $SD = 1.58$, $Mdn = 2.00$). The pictures in the moderately attractive category were those six pictures that scored right above and below the average score given to the 50 pictures. The six male pictures within this category scored on average 3.65 ($SD = 1.96$, $Mdn = 3.00$) and the six female pictures 4.95 ($SD = 1.75$, $Mdn = 5.00$). Planned contrast analyses of the pretest showed that for both pictures of men and women all groups were rated significantly different from each other, with t 's > 13.00 and p 's $< .001$. Also in the main experiment, attractive, moderately attractive, and unattractive pictures differed significantly in the scores given on perceived physical attractiveness, with for all contrasts t 's > 15.83 and p 's $< .001$.

Profile Texts

Based on existing dating profiles (Van der Zanden et al., 2018), 18 profile texts were constructed, with different contents for each. This content was kept neutral, meaning that no potentially extreme preferences, interests, or hobbies were mentioned. Primarily, the texts provided a textual description of who the profile owner is, what their hobbies/interests are and what kind of partner and relationship (s)he seeks. The contents of texts supposedly written by male and female profile owners were identical, with the exception of one or two gender-specific word(s) in each text (e.g., "man", "her"). Texts ranged from 60 to 67 words.

For each profile text, a version with and without language errors was created. The text with errors each contained eight errors, based on observations made in a corpus analysis on language errors in existing dating profiles (Van der Zanden et al., 2018). Different types of errors were included

in each text (e.g., grammatical, typographical error). Figure 4.2 shows two examples of translated versions of the dating profiles used for the experiment. The profile on the right includes language errors, with the first three errors, for example, being a spacing error, a typographical error, and an ellipsis, respectively.

A pretest with 55 participants ($M_{\text{age}} = 26.3$ years, $SD_{\text{age}} = 7.71$, 63.6% women) was conducted to check whether the overall text quality of texts with language errors was rated lower compared to texts without errors. To measure this, for half of the texts participants answered the question “How do you assess the quality of this text?” on a scale from 1 to 10. Overall text quality scores were lower for texts with errors ($M = 4.18, SD = 1.32$) than for texts without errors ($M = 6.29, SD = 1.29$), $F(1, 52) = 88.58, p < .001, \eta_p^2 = .630$. Based on these pretest findings, some minor adaptations were made to 5 of the 18 texts for the main experiment. This was done to make the overall perceived text quality scores of all texts with and without errors more even; parts of two texts were exchanged as the overall score was relatively high for one text and relatively low for the other. In two other texts, one error was replaced by a less remarkable one as the error version of this text scored lower compared to other texts with errors. Finally, the overall text quality score of one error-free text was relatively low, and a sentence was reformulated in such a way it was expected to improve overall text quality.



Figure 4.2 Examples of translated English versions of the original Dutch dating profiles used in the experiment. The left profile is a moderately attractive male profile without language errors and with the picture on the left side, and the right profile presents an attractive female profile with language errors and with the picture right-sided.

Note. Language errors are underlined here, but not in the profiles presented to participants.

Dating Profiles

A subset of 108 combinations of pictures and texts were made as experimental material for both profiles of males and females (6 pictures \times 18 texts). All picture-text combinations were unique and randomized to avoid an effect of a particular picture or text. To control for a potential leftward fixation bias (Leder et al., 2016), half of the profiles a participant saw had the picture on the profile's left side, and the other half depicted it on the right side. The position of the picture and text was fully crossed

across conditions. The profile's picture and text were of equal size (See Figure 4.2). All materials used for this study are available in OSF, at osf.io/cbtv2/.

Procedure

Participants were seated approximately 70 cm in front of a computer screen (1,680 × 1,050 pixels) at the eye tracking laboratory of our university. Before the experiment started, participants were welcomed and provided written informed consent. Then, the participant's eyes were calibrated and validated using a nine-point procedure using the SMI RED 2015 device with a sampling rate of 250 Hz. The experiment was opened in Qualtrics after successful calibration, and participants' eye movements on this site were followed. They were then instructed and answered some demographic questions (i.e., gender, age, sexual preference, relationship status). Participants were told that they would see around twenty mock-up dating profiles that they had to view and judge in a natural manner. Before participants were randomly assigned to one of the available six lists of 18 male or female profiles (based on the indicated sexual preference), they viewed one test profile. The 18 profiles, from which nine contained language errors and nine were free of errors, were then presented to them in a random order. When participants were done viewing a profile, they pressed a key to answer three impression formation statements about the owner of the profile.³ Once the statements were answered, a cross was displayed on the screen for three seconds on which participants had to focus before the next profile appeared. When all 18 profiles were viewed and rated, one last post-test profile with language errors was shown, about which they also had to indicate whether they had noticed language errors in that profile (86.1% indicated to have noticed the errors). The pre- and post-test profiles used were the same across lists, and the data from these profiles were not analyzed. In total, the experiment took approximately 20 minutes, dependent on the duration of the calibration.

Measures and Analysis

Eye Tracking Measures

Only fixations that occurred on either the profile picture or text were included, and a fixation only counted as one if it lasted 40ms or longer (Bar et al., 2006; Scott & Hand, 2016). As each participant assessed 18 profiles, there were 18 cases for each participant (3.70% missing cases because no fixations occurred on the profile at all). While viewing was binocular, eye movements from the right eye were analyzed with an average tracking ratio of 97.2% ($SD = 4.67$). Five eye tracking measures were used as dependent variables to test our hypotheses: (a) first fixation location, that is whether the first fixation occurred on either the profile picture or text (H1), (b) picture fixation count (abbreviated as PFC), that is the total number of fixations on the picture (H2), (c) picture fixation duration (PFD), being the total fixation duration on the picture in milliseconds (H2), (d) fixation count

on the text (TFC), that is the number of fixations on the text (H3), and (e) fixation duration on the text (TFD), that is the total fixation duration on the text in milliseconds (H3).

Attractiveness Perception Measures

Impressions of attractiveness were measured with three items, each covering another dimension of perceived attractiveness: physical attractiveness, social attractiveness (McCroskey & McCain, 1974), and romantic attractiveness (Campbell, 1999). To fit our experiment, the wording of the used items was translated and slightly adjusted. The items were “I think this person is good-looking” for physical attractiveness, “I think this person is nice to spend time with” for social attractiveness, and “I feel attracted to this person” for romantic attractiveness. Each of these items were measured on a scale from 1 (*completely disagree*) to 7 (*completely agree*).⁴

Analysis

To test whether pictures are more likely to attract initial attention (H1), a chi-square test was performed, with first fixation location (picture/text) and picture position (left/right) as binary variables. To test H2, H3, and H4, linear effect models were conducted in R using the *lme4* package (Bates et al. 2014),⁵ as well as the *lmerTest* package to obtain *p*-values applying the Satterthwaite approximation (Kuznetsova et al., 2014). Picture attractiveness and language error presence were included as fixed factors and a random intercept was included for participants.⁶ Interactions between factors were included. For H2 the dependent variables were the picture fixation count and duration and for H3 the text fixation count and duration. The mean scores on all three dimensions of perceived attractiveness were the dependent variables for H4. The data underlying this article are available at osf.io/cbtv2/.

Results

In this section, we first report on the tests of the preregistered hypotheses on both the eye tracking and perception data, followed by an exploratory follow-up analysis section that zooms in more specifically on how the dating profiles are processed.

Independent of picture or text condition, participants fixated on average 10.97 seconds ($SD = 6.70$) on the dating profiles, from which 2.23 seconds (20.3%, $SD = 2.75$) were on the picture and 8.74 seconds (79.7%, $SD = 4.99$) on the text. Within this period of time, people made on average 59.8 ($SD = 32.3$) fixations per profile, from which 9.5 (15.9%, $SD = 11.6$) were on the picture and 50.3 (84.1%, $SD = 25.4$) on the text.

Main Results

Eye Tracking Data

First Fixation Location. In accordance with H1, the chi-square test with first fixation location and picture position as the variables was significant, $\chi^2(1) = 11.29, p < .001$. People were in general more likely to fixate initially on the picture than on the text, and were more likely to initially fixate on the picture when it occurred on the profile's left side than on the profile's right side. Table 4.1 provides the percentage scores. On average, first fixations lasted 164.98 milliseconds ($SD = 154.67$), with the first fixations on pictures being longer ($M = 194.0, SD = 190.5$) than those on texts ($M = 129.9, SD = 79.7$). This is a significant difference according to Welch's *t*-test, $t(662.1) = 6.58, p < .001, d = 0.44$.⁷

Picture Fixation Count (PFC) and Duration (PFD). The total PFC and PFD in all three picture attractiveness conditions are presented in Table 4.2. Picture attractiveness affected PFC, $F(2, 783.9) = 9.21, p < .001, \eta_p^2 = .008$, and PFD, $F(2, 784.0) = 10.99, p < .001, \eta_p^2 = .009$. Planned contrast analyses for both PFC and PFD showed that people tend to fixate more and longer on attractive than on moderately attractive and unattractive pictures (all t 's $> 2.66, p$'s $< .008, d$'s > 0.210). Furthermore, while fixation durations were longer on moderately attractive than on unattractive pictures, $t(783.95) = 2.03, p = .043, d = 0.118$, participants did not look more at moderately attractive than at unattractive pictures, $t(783.90) = 0.76, p = .443$. Robust support was thus found for Hypothesis 2: people looked more often and longer at attractive than at moderately attractive and unattractive pictures, and looked longer, but not more often, at moderately attractive than at unattractive pictures.⁸

Text condition did not affect the PFC and PFD and there were no interaction effects (with all F 's < 2.71 and p 's $> .100$).

Text Fixation Count (TFC) and Duration (TFD). The number of fixations and the total fixation duration on the profile text did not differ depending on the attractiveness of the picture (TFC: $F(2, 784.1) = 0.945, p = .389$, TFD: $F(2, 784.1) = 0.643, p = .526$). This means that people do not pay more attention to the profile text when a profile contains a moderately attractive picture than when it contains an attractive or unattractive picture. Thus, H3 is not confirmed.

While picture attractiveness did not affect text attention, language errors did. Participants fixated more and longer on texts with language errors than on those without, with both F 's $> 4.16, p$'s $< .042, \eta_p^2$'s $> .002$. There were no interaction effects of picture attractiveness and language errors on text attention (both F 's $< 0.604, p$'s $> .547$). The mean scores of text attention are presented in Table 4.3.

Table 4.1 Percentages of First Fixations on the Profile Picture or Text Posited on the Profile's Left or Right Side.

	Picture position left	Picture position right	Total
First fixation on picture	62.4%	50.6%	56.5%
First fixation on text	37.6%	49.4%	43.5%

Table 4.2 Mean Scores (SD) for Fixation Count and Duration on Profile Pictures for All Three Picture Attractiveness Conditions.

	Picture attractiveness		
	Attractive (<i>n</i> = 278)	Moderately attractive (<i>n</i> = 281)	Unattractive (<i>n</i> = 273)
Picture fixation count	10.88 (12.01) ^a	9.14 (12.03) ^b	8.51 (10.51) ^b
Picture fixation duration (in sec)	2.55 (2.93) ^a	2.22 (2.77) ^b	1.91 (2.46) ^c

Note. Different superscripts in rows indicate significant differences between the levels of the picture attractiveness condition.

Table 4.3 Mean Scores (SD) for Fixation Count and Duration on Profile Texts in the Picture Attractiveness and Language Errors Condition.

	Language error presence	Picture attractiveness		
		Attractive	Moderately attractive	Unattractive
Text fixation count	No errors	49.47 (22.23) ^a	49.22 (30.42) ^a	48.79 (23.55) ^a
	Errors	53.06 (26.00) ^b	51.12 (26.45) ^b	49.91 (23.13) ^b
Text fixation duration (in sec)	No errors	8.38 (4.37) ^a	8.38 (5.56) ^a	8.35 (4.73) ^a
	Errors	9.36 (5.17) ^b	9.16 (5.17) ^b	8.83 (4.85) ^b

Note. Different superscripts in columns indicate significant differences between the language error conditions within each picture attractiveness condition.

Table 4.4 Mean Scores (SD) for Both Conditions on All Three Dimensions of Perceived Attractiveness.

		Picture attractiveness		
		Attractive	Moderately attractive	Unattractive
Physical attractiveness	No errors	5.22 (1.48)a	3.75 (1.53)a	1.91 (1.09)a
	Errors	5.41 (1.14)a	3.40 (1.55)b	1.76 (0.82)a
Social attractiveness	No errors	4.86 (1.24)a	4.59 (1.16)a	4.00 (1.37)a
	Errors	4.51 (1.14)b	4.18 (1.24)b	3.71 (1.25)b
Romantic attractiveness	No errors	4.46 (1.62)a	3.02 (1.50)a	1.76 (1.01)a
	Errors	3.98 (1.47)b	2.57 (1.42)b	1.47 (0.66)b

Note. Given scores on all three dependent variables differ significantly between levels of the picture attractiveness condition. Different superscripts in columns indicate significant differences between the two levels in the language error condition.

Perception Data

Picture Attractiveness. Results showed main effects of picture attractiveness on perceived physical, $F(2, 784.5) = 705.2, p < .001, \eta_p^2 = .545$, social, $F(2, 785.0) = 37.91, p < .001, \eta_p^2 = .072$, and romantic attractiveness, $F(2, 784.6) = 334.3, p < .001, \eta_p^2 = .392$. For all three attractiveness dimensions, profile owners with attractive pictures received significantly higher scores than those with moderately attractive pictures, and unattractive pictures got significantly lower scores still (with all t 's > 1.98 and p 's $< .048$).

Language Errors. Profile owners with language errors in their texts scored lower on perceived social, $F(1, 784.9) = 20.26, p < .001, \eta_p^2 = .020$, and romantic attractiveness, $F(1, 784.5) = 24.27, p < .001, \eta_p^2 = .023$, but not on perceived physical attractiveness, $F(1, 784.4) = 2.03, p = .154$. Table 4.4 presents for both conditions the mean scores on all three dimensions of attractiveness.

Interaction. For perceived physical attractiveness a significant interaction was found, $F(2, 784.7) = 4.66, p = .010, \eta_p^2 = .007$, but there was none for social nor for romantic attractiveness, $F(2, 784.4) = 0.217, p = .805$ and $F(2, 784.9) = 0.485, p = .616$, respectively. Simple effects analyses for physical attractiveness showed that when a profile contained a moderately attractive picture, the given scores on physical attractiveness to profile owners with and without language errors in their texts differ significantly with lower scores for profiles with ($M = 3.40, SD = 1.55$) than for those without errors ($M = 3.75, SD = 1.53$), $F(1, 784.5) = 7.54, p = .006$, while this is not the case for profiles with attractive or unattractive pictures (with F 's < 2.29 , and p 's $> .131$). This means H4 is partially supported: the expected interaction effect of picture attractiveness and language errors was only found for perceived physical attractiveness.⁹

Exploratory Analyses

To further examine how people processed the multimodal dating profiles, we performed additional exploratory analyses. First, we examined how often participants switched between the picture and text during the profile viewing process, then looked into the proportion of fixations on pictures and texts over the course of the process, and finally, we zoomed in on the different profile processing strategies that could have been used, and investigated whether the used processing strategy affected impression formation differently.

General Viewing Patterns

On average, participants switched 3.12 times ($SD = 2.04$) between the picture and text on a profile, which is relatively low considering the average of sixty fixations on each profile in total. This suggests that the average profile viewing process consists of four episodes of (in most cases a larger number of) fixations on the profile components, from which two are on the picture and two on the text. The number of switches did not differ depending on the picture or text condition (all conditions ranged between 3.02 and 3.22 switches).

For a general view on the processing order of the two components on the profile, we divided each profile that was processed into 20 bins, each representing 5% of the total number of profile fixations, and then aggregated that data across participants and stimuli. The proportion of fixations on the picture and text was then calculated for each consecutive bin.¹⁰ Figure 4.3 shows that during the first 5% of the fixations on the profile, picture processing is most likely to take place. Then, the proportion of text fixations increases to almost full text attention. Toward the end of the viewing process (the last 15–20%), there is again an increase in picture fixations, which could indicate that fixations are directed to both components for integrative processing. Across all six conditions, the viewing patterns were almost identical, with only minimal differences in the proportion scores at the beginning and end of the viewing processes. Note that, overall, the proportion of text fixations is much higher than that of picture fixations, which is not surprising considering the relatively high number of fixations needed to read a text compared to processing a picture. Figure 4.4 gives an example of the order of fixations on the picture and text on a dating profile, corresponding with the general viewing pattern described.

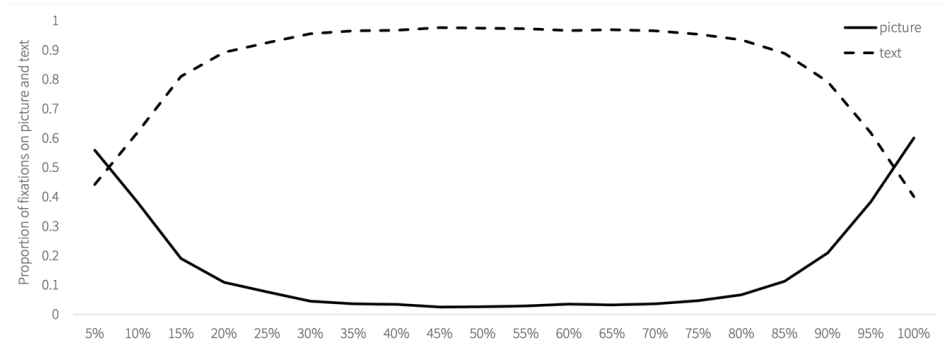


Figure 4.3 Plot of the proportion of fixations on the profile pictures and texts within bins of five percent.



Figure 4.4 Examples of a scan path of a profile where the picture (moderately attractive) is processed before the text (without language errors).

Note. Circles indicate fixations, with larger circles for longer fixations. Consecutive numbers show the viewing order.

Different Viewing Strategies and Perceived Attraction

There are a number of potential strategies participants could use to process the dating profiles. For each profile process, we categorized whether a multi-switching strategy, a first-picture-then-text strategy, or a first-text-then-picture strategy was used. The unit of analysis was each individual profile that was processed, resulting in a total of 831 cases.

The following criteria were used for categorization: cases with no switches at all ($n = 22$; 2.6%) were not categorized because one of the two components did not receive any attention. All cases with one to six switches were categorized as either first-picture-then-text or first-text-then-picture processing. Cases in which at least two of the first three fixations were on the picture were categorized as picture-first (50.8%) and cases with two or more of the first three fixations on the text as text-first (40.7%). Furthermore, a case was categorized as multi-switching processing when seven or more

switches occurred on the profile ($n = 47$; 5.6%). This threshold of seven was determined following previous eye tracking research (e.g., Bucher & Schumacher, 2006; Rayner et al., 2001) and empirically, by inspection of the data. We observed that some people first looked briefly at both the picture and text (which could indicate orientating), then attended longer to both components (deeper processing), and then briefly fixated on both components again (merging). As such, seven switches would indicate more switches than if people would look at both the picture and text in each of the three phases.

To examine whether processing strategy led to different effects on perceived attractiveness, we ran additional linear mixed effect models with processing strategy as added fixed factor compared to the earlier analyses. The picture- and text-first strategies were the two processing strategies that were considered in this factor. Only for perceived romantic attractiveness a main effect of processing strategy was found, as well as an interaction effect of processing strategy and text condition. In general, lower romantic attractiveness scores were given when the text was processed first ($M = 2.86$, $SD = 1.71$) than when the picture was processed first ($M = 3.04$, $SD = 1.78$), $F(1, 754.8) = 6.21$, $p = .013$. The interaction effect showed that processing strategy did affect perceived romantic attractiveness for profiles without errors but not for profiles with errors, $F(1, 726.1) = 4.28$, $p = .039$. For profiles without language errors, scores on perceived romantic attractiveness were significantly higher when the picture was processed first ($M = 3.33$, $SD = 1.84$) than when the text was processed first ($M = 2.70$, $SD = 1.66$), $F(1, 761.8) = 10.4$, $p = .001$, while for profiles with errors there were no differences between romantic attractiveness scores between picture-first ($M = 2.74$, $SD = 1.66$) and text-first views ($M = 2.53$, $SD = 1.52$), $F(1, 758.7) = 0.258$, $p = .612$. No main or two-way interaction effects of used processing strategy with picture and text condition were found for physical and social attractiveness (all F 's < 1.91 , p 's $> .127$).

Moreover, a significant three-way interaction effect of used processing strategy, picture condition, and text condition on perceived physical attractiveness ($F(2, 722.1) = 5.02$, $p = .007$) revealed that processing strategy only affected perceived physical attractiveness for profiles with an attractive picture and without errors: for these profiles, physical attractiveness scores were higher when the picture was processed first ($M = 4.70$, $SD = 1.57$) than when the text was processed first ($M = 4.04$, $SD = 1.59$), $F(2, 735.8) = 8.70$, $p = .003$. This suggests that when the picture is processed first, attractive pictures have a stronger positive effect. In all other conditions, perceptions of physical attractiveness were not affected by the order in which the profile components were processed (with all other F 's < 2.96 and p 's $> .086$).

Overall, the exploratory analyses suggest a clear pattern in the viewing behavior by participants: they look at both the picture and the text, often by focusing on the picture first, then on the text. Switching repeatedly between the two components is rare. Moreover, processing strategies

remain relatively unaffected by the picture and text manipulations, suggesting that the viewing patterns are robust. The used processing strategy seems to have some influence on how (strong) the effects of the manipulations on impressions formation scores are.

General Discussion

This study investigated how online dating profiles that contain pictures varying in attractiveness and texts with or without language errors affect profile processing and impressions of profile owner attractiveness. One goal of this study was to test the picture gatekeeper model, which proposes that the attractiveness of a profile picture is key in the impression formation process. It was therefore assumed that pictures on dating profiles would receive first attention and that the picture's attractiveness would determine how much attention people would pay to the profile text. To investigate this, we collected both eye tracking and perception data.

Eye tracking results revealed that when people are presented with multimodal dating profiles containing a picture and a text, pictures are more likely to attract initial attention (which is consistent with for example Scott & Hand, 2016 and Seidman & Miller, 2013). This confirms H1 and is in line with the picture gatekeeper model. Results also supported H2: the more attractive the picture, the more frequent and longer people look at the picture (in accordance with for example Leder et al., 2016 and Valuch et al., 2015). In addition, people fixated more and longer on profile texts with language errors than on those without errors (see also Rayner, 1998).

While our results highlight the importance of the profile picture, they also indicate that a picture does not necessarily function as gatekeeper to the rest of the profile. Regardless of the picture's attractiveness, the profile text attention was around nine seconds and 50 fixations, that is, around 80% of the total profile attention. Inconsistent with H3, there was not more attention for the profile text when a picture was moderately attractive than when it was attractive or unattractive. More specifically, texts on profiles with attractive and unattractive pictures received more attention than was originally expected.

In line with H4 and the picture gatekeeper model, language errors had a negative effect on perceived physical attractiveness when a profile included a moderately attractive picture but not when it contained an attractive or unattractive picture. This could indicate that when picture information is not (yet) sufficient to form an impression about physical attractiveness, textual cues carry greater weight. However, inconsistent with H4 and the picture gatekeeper model, these interaction effects of picture attractiveness and language errors were not found for perceived social and romantic attractiveness. This suggests that both picture and text attractiveness influence impressions about social and romantic attractiveness, irrespective of the attractiveness of the profile

component in the other modality. People may thus use cues about picture and text attractiveness relatively independently to form separate impressions about social and romantic attractiveness. These differential results imply that it is not just the heuristic of “what is beautiful is good” that leads to impressions about attractiveness.

To get a better view on how multimodal dating profiles were processed, we conducted exploratory analyses. General viewing patterns revealed that people are most likely to process the picture prior to the text, with the first 5% of the profile fixations mostly being on the picture. The absence of differences in general viewing patterns and number of modality switches across picture and text conditions suggests that profile cues have little impact on the general profile viewing process. At the same time, both profile cues do affect impression formation scores, but there are few interaction effects between the two types of cues. This seems to indicate that profile processing and impression formation occur in two relatively independent stages. This is corroborated by the finding that what profile component was processed first had little effect on further impression formation.

Implications

Our study has several theoretical implications. First, finding no interaction effect of picture attractiveness on text attention reveals that people did not look longer at texts of profiles with moderately attractive pictures than at profiles with attractive or unattractive pictures. It seems that even when a profile picture was attractive or unattractive, the initial impression based on pictorial information did not withhold people from further text processing. Participants dedicated significant attention to all profile texts which suggests they processed profile texts deliberately, irrespective of the picture’s attractiveness. In fact, our results may even imply that neither the text nor the picture was processed (solely) heuristically, because both the profile’s picture and text received a considerable amount of attention, and cues in both components affected perceptions of attractiveness.

Consequently, the main theoretical implication of this study is that our results are not consistent with the picture gatekeeper model. Therefore, based on the patterns we observe in our data, we put forward an alternative model of how pictures and texts on multimodal dating profiles are processed and how the two profile components affect impression formation. We dub this model the multimodal information processing (MIP) model, which is presented in Figure 4.5. Based on the results of this study, we suggest that to develop impressions about a dating profile owner, people take stock of the information provided in each of the two modalities. They seem to do this consecutively, often starting with the picture modality. This MIP model could be an important contributor to theories about (multimodal) information processing and online impression formation

on three levels, which leads to three discernable stages in the model: the processing stage, the cue assessment stage, and the impression formation stage.

In the first stage, people separately process the profile’s picture and text, in which the picture is likely to be processed first. This accords with both H1 and the general viewing pattern of the exploratory analyses. Picture and text processing seem to occur as two relatively isolated events—with little switching between the components (see also Carroll et al., 1992; Rayner et al., 2001). This is potentially in line with extant research indicating distinct picture and text processing (e.g., Barry, 1997; Paivio, 1990; Powell et al., 2019). Paivio (1990) proposed earlier in his dual coding theory that pictorial and textual information is processed in different subsystems in working memory, resulting in a parallel construction of two separate mental models. Prior to the construction of these separate mental models, no interplay is assumed to take place (Eitel et al., 2013).

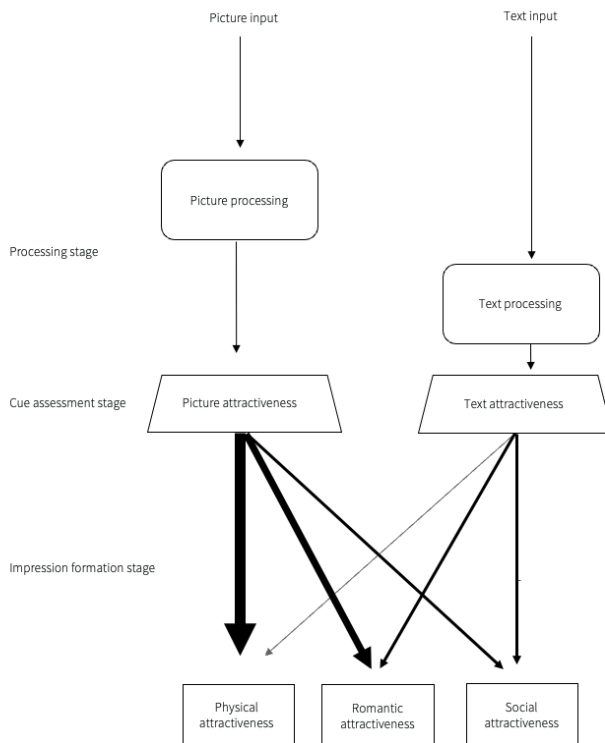


Figure 4.5 Schematic representation of the processing flow in the multimodal information processing (MIP) model.

In the second stage, people assess the different pictorial and textual cues that are available on the profile. In the specific case of this study, this results in separate main effects of the picture (attractiveness) and text (language error presence) manipulations. At this stage, perceptions are attributed to profile cues, such as about the attractiveness of the pictorial and textual cues. As no interaction effects of picture and text attractiveness were obtained on the processing of these two components—suggesting relatively independent picture and text processing—it is most likely that pictorial and textual cues also lead to separate assessments about the attractiveness of these cues.

In the third and final stage, perceptions that are developed about picture and text attractiveness are used to form impressions about profile owners and their attractiveness. Our data suggest that separate impressions are formed for each dimension of perceived attractiveness instead of one overall impression. This finding deviates from previous research that assumes that people favor to form one general impression rather than evaluating someone on each attribute to form different impressions (cf. Kahneman, 2011; Willis & Todorov, 2006). We found that picture attractiveness primarily affects perceived physical attractiveness, and to a lesser extent social and romantic attractiveness, while text attractiveness affects social and romantic but not physical attractiveness. The finding that pictorial and textual cues differ in impact depending on the specific aspect of attractiveness that is assessed draws on previous findings from Chapter 3, where it was posed that interpersonal attraction may not always be considered a unidimensional construct. The arrows in the model in Figure 4.5 represent the effects of picture and text attractiveness on each dimension of attractiveness, with the size of the effects being indicated by the arrows' thickness.

This study also yields practical implications for online daters. Given our results, online daters are recommended to invest time and effort in both the picture and text of their profile. Profile pictures and texts are not only both likely to receive attention, but online daters should also take into account that both pictorial and textual profile cues affect perceived attractiveness: attractive pictures positively affect perceived attractiveness, but regardless of the picture, language errors have a negative effect. The latter finding highlights that online daters should try to avoid language errors in their profiles. Another reason why daters should consider both profile components is because people seem to use pictorial information primarily for impressions about physical attractiveness, and to a lesser extent social and romantic attractiveness, whereas language errors most heavily impact impressions of social attractiveness, which is mostly concerned with perceptions of a profile owner's personality. This implies that specific impressions are formed on the basis of different pieces of information on the profile.

Finally, our results reveal practical insights for designers of online dating platforms. Our finding that pictures are more likely to capture initial attention when they occur on the left rather than the profile's right side may suggest that the way dating platforms organize profiles could

influence (to some extent) how their members view profiles of others. Most dating platforms seem to anticipate on the relevance of picture attractiveness by placing the picture on the position of the profile where it appears most prominent and almost certainly receives initial attention, that is, either at the top of the profile (e.g., on applications like Tinder) or on the profile's left side (e.g., on web-based sites like eHarmony). There are however dating platforms that want to place less emphasis on initial picture attention and more emphasis on profile texts or other (textual) information in the initial impression formation phase. For these platforms, it could be relevant to experiment with the position of the profile picture and text as to enhance initial text attention.

Directions for Future Research

Our data seem to fit the MIP model better than the picture gatekeeper model. However, the independent processing of cues in different modalities and the extent to which they lead to separate assessments of attractiveness should be investigated further, for example by comparing cue assessments when presenting a one-modality profile with a profile that includes that and another component (i.e., two modalities). Moreover, future research could attempt to further disentangle the second and third stage of the MIP model; for instance by collecting assessments regarding the picture, the text, and the profile owner's attractiveness separately, as based on our data we cannot test whether cue attractiveness assessments occur prior to the impressions formed about the person "behind" the profile. New (preregistered) studies should thus be conducted to further examine the model's viability and the different stages within the model.

The separate, independent effects of the profile cues on the different dimensions of perceived attractiveness raise the question how and when the specific aspects of impression formation eventually integrate into one final decision. In the case of online dating, it could be that one eventually integrates the different attractiveness impressions – formed on the basis of different profile cues – to come to a final decision about whether to pursue contact with the profile owner. While in our study the measure of perceived romantic attractiveness may have been an indication of romantic interest, this was not a statement that inquires actual interest in sending a message to or going on a date with the profile owner. To investigate the relative weight of the different impressions, it would be interesting for future work to also test when people integrate the impressions to one decision, for example by providing them the option to like or dislike a profile after assessing it.

The profile setup that was used for this study matched with how daters on various large profile-based sites (e.g., Relatieplanet, eHarmony) encounter a profile for the first time, that is, with a single picture and a short self-description. On such sites, daters often decide on the basis of this information whether they want to find out more about the profile owner, which they can do by clicking on the profile. Usually, this involves not only more demographic and written answers to

questions, but also more pictures. A next step would be to investigate whether comparable viewing patterns would occur when people view the full profile, that is, by looking at all pictures prior to processing other textual information.

The immediate and simultaneous availability of the picture and text on the profiles in this study, may have influenced participants' perceived importance of both profile components for impression formation. This may have resulted in more attention to the profile and profile cues than may have been given in a real-life dating setting, where immediately accepting or discarding a profile might occur. Especially on photo-based dating platforms, such as Tinder, pictures are primarily used for impression formation and deciding whether to swipe left (no interest) or right (interest). Although in these contexts picture attractiveness may be used as the profile's gatekeeper, our MIP model may still hold as people may make the decision on an incomplete impression based only on picture attractiveness and the associated physical attractiveness perception, resulting in little or no consideration of other impression formation dimensions (e.g., social attractiveness). This, however, should be tested in a future experiment.

The aim of this study was to gain insight into the impression formation process by collecting both eye tracking data and perception data. While viewing dating profiles, eye movement data can reveal in a precise and objective manner (unconscious) cognitive processes and preferences of people, such as what parts of a profile have been attended to, when, how long and often, and in what order. The data can however not tell us why people did – or did not – attend to these different components (Holsanova, 2014). Based on our results, it is for example difficult to ascertain participants' rationale to look at all profile texts. It could be that picture attractiveness did not immediately lead to an overall impression which made participants shift their attention to profile texts, or participants formed overall impressions based on picture attractiveness but tried to confirm these initial impressions by paying attention to profile texts. Interviews or thinking-aloud methods in which participants try to verbalize the rationales behind their profile viewing behavior could be a way to further extend our understanding of the online impression formation process.

To conclude, our study is the first that used eye tracking to investigate people's impression formation processes while looking at multimodal online dating profiles. Our results seem to indicate that picture attractiveness and language errors mostly separately affect picture and text processing, which could result in distinct impression formation processes. In general, this research shows that most profile attention is devoted to texts but that pictures have the strongest impact on impression formation. Even though picture attractiveness is highly determining, it does not seem to affect text processing and the resulting effects on impression formation. Thus, pictures and texts are likely to be processed relatively independently and lead to separate impressions on different aspects of perceived attractiveness.

Footnotes

¹ Alternatively, one could also argue that people are interested to learn more about attractive individuals (Garcia et al., 1991; Langlois et al., 2000), which would lead to the prediction that people would pay closer attention to texts of profile owners with attractive pictures compared to less attractive pictures, as a way to confirm the positive initial impression and increase reward feelings. However, even though this is ultimately an empirical question, we believe this is in fact unlikely to happen in the context of online dating considering the decisive role of physical and picture attractiveness in this setting (Fiore et al., 2008) combined with people's tendency to minimize (processing) efforts (e.g., Kahneman, 2011).

² H3 presented here in the chapter deviates in two ways from what we stated in our preregistration. First, the category that was called average attractive in the preregistration is called moderately attractive in this chapter. Second, we said that we would look into the relative attention to the profile text as opposed to the fixation count and duration in absolute numbers. Before collecting the data, we took into account potential differences between relative and absolute measures, but during the analyses we found that results were actually very similar for both measures. We decided to primarily report the results of absolute picture and text attention to retain consistency in the measures reported on to test eye tracking related hypotheses. Full analyses of all measures can be found at osf.io/cbtv2/.

³ Participants were asked to answer two other impression formation statements regarding perceived intelligence (based on Leach et al, 2007) and attributional confidence (based on Clatterbuck, 1979). Only two main effects of picture attractiveness and language errors on perceived intelligence were found, with both F 's > 22.91 and p 's $< .001$. Profile owners with an unattractive picture were rated as significantly less intelligent than profile owners with attractive and moderately attractive pictures, while profile owners with attractive and moderately attractive pictures were rated as similarly intelligent. Moreover, profile owners with language errors in their profiles scored lower on perceived intelligence than profile owners without errors. No main or interaction effects of picture and text attractiveness were found on attributional confidence (with all F 's < 1.11 and p 's $> .33$). As our hypotheses did not focus on perceived intelligence and attributional confidence, results on these variables were not integrated in the chapter.

⁴ By not clustering the three dimensions of attractiveness, we deviate from what is stated in the preregistration. Our reason to look into the dimensions separately is that different dimensions of perceived attractiveness may not always been seen as one unidimensional construct, in particular, when rating dating profiles with language errors (Chapter 3). To get a better insight into whether and

how different profile components may be used to form impressions on different dimensions of attractiveness, we decided to not cluster them. The Cronbach's alpha of the three items was .82.

⁵ In our preregistration, it was stated that we would perform MANOVA's to test our hypotheses. Upon data collection, we recognized this test would not be optimal to analyze our data, as we could then not control for individual differences (Valuch et al., 2015). We therefore decided to deviate from what was posed in the preregistration and employed linear mixed effect models.

⁶ For H2, H3, and H4, the same models with random by-participant slopes for picture and text condition were included in an additional model. Results with and without these slopes were similar, and we therefore reported those without. Also adding picture position or picture or text version did not alter the obtained findings and did not lead to better performing models of H2, H3, and H4. Therefore, the results reported are those with only participants as random intercept, and picture and text condition as fixed factors.

⁷ Previous eye tracking studies differ in what is counted as a fixation. Previously, fixations of 40 (e.g., Scott & Hand, 2016) and 100 milliseconds (e.g., Leder et al., 2016) have for example been taken as a cut-off point. In this study, each fixation that lasted 40ms or longer counted as a fixation. From all first fixations on the picture or text, 33.2% was between 50 and 99.9ms. The same chi-square tests with only first fixations of at least 100ms included provided similar results as what is reported now with first fixations of 40ms or longer, $\chi^2(1) = 11.23, p < .001$ (30.5% on the left-sided picture, 24.9% on the right-sided picture, 19.3% on the left-sided text, 25.3% on the right-sided text).

⁸ Results reported on the effects of picture attractiveness on PFC and PFD are those in which only picture attractiveness was added as a factor in the model. Similar results were found when the language errors condition was added to the model as additional factor.

⁹ Interaction effects of picture attractiveness and gender were found on perceived physical and romantic attractiveness, with both F 's > 4.10 and p 's $< .024$. These showed that men and women differ more in their ratings given to profiles with attractive and moderately attractive pictures than in their ratings to profiles with unattractive pictures. This seems to indicate that pictures that are more attractive have a stronger positive influence on men's than on women's ratings.

¹⁰ In this chapter, we present the results of the proportion of fixations on the picture and text with bins of 5% for each processed profile. We decided to go for bins of 5% as almost each profile received at least 20 fixations ($n = 769$) and this figure could thus provide the most detailed viewing pattern. We found comparable viewing patterns when we used bins of 10% or 20%.

5

Effects of Perceived Profile Text Originality on Impression Formation

This chapter is based on:

Van der Zanden, T., Mos, M., Schouten, A., & Kraemer, E. (2021). Originality in Online Dating Profile Texts: How Does Perceived Originality Affect Impression Formation and What Makes a Text Original? *Submitted for publication.*

Abstract

This chapter investigates origins and consequences of perceived profile text originality. The first goal was to examine whether the perceived originality of authentic dating profile texts affects online daters' perceptions of attractiveness, and whether perceptions of (less) desired partner personality traits mediate this effect. Results showed the positive impact of perceived originality on impression formation: profile text originality positively affects perceptions of intelligence and sense of humor, which improve impressions of attractiveness and boost dating intention. The second goal was to explore what profile text features increase perceptions of text originality. Results revealed profile texts which were stylistically original (e.g., include metaphors) and contained more and concrete self-disclosure statements were considered more original, explaining almost half of the variance in text originality scores. Taken together, our results suggest that perceived originality in profile texts is manifested in both meaning and form, and is a balancing act between novelty and appropriateness.

Keywords: online dating; originality; profile texts; impression formation; interpersonal attraction; personality; content analysis

Introduction

In music, movies, and books, originality may be seen as one of the best ways to someone's heart. Not only is original work considered more attractive, as opposed to less original work, but this also generalizes to the producer of the work (Nettle, 2009). It was through the texts they wrote that Lord Byron, Honoré de Balzac, and Victor Hugo achieved good regard and hence conquered (many) hearts (Wallace et al., 2008). Other research on professional and non-professional writers also found that the success of writers, as for example measured by number of publications or text evaluations, can indicate writers' success in attracting potential partners (Lange & Euler, 2014; Nettle & Clegg, 2006; Watkins, 2017).

According to Sternberg (1988, p. 126), "few psychological constructs have proved more elusive to define" than creativity and originality, which may also explain the variation in definitions used for the constructs (Jones, 2015; Runco & Jaeger, 2012; Parkhurst, 1999). This chapter uses the term (text) originality to refer to texts that are not common and differ from most others in the specific communicative setting for which they are written, with original texts being a potential result of the creative process that has taken place. Moreover, a range of methods has been used to measure originality in texts, with for example studies on prose, poetry, and song lyrics using objective measurements such as the number of unique words (e.g., Berger & Packard, 2018; Form, 2019; Simonton, 1990). While most of these studies found that originality can predict a product's popularity and success, less is known about what texts people deem original, and how perceptions about the originality of a text affect impressions that are formed about the writers of these texts. What specific features constitute originality in texts that are perceived as being original is also understudied. These issues are taken up in the current chapter, in the context of online dating profile texts, where an original text may be particularly relevant to attract potential romantic partners.

In online dating, the free-text component of dating profiles offers many opportunities to be original. An original dating profile text can be effective to attract attention, which may be particularly appealing now that the greater use of online dating increases the number of members and profiles of these people (e.g., Markowitz et al., 2018). Moreover, if originality in writing is indeed evaluated positively, profiles that are perceived as being original may also be seen as attractive, and owners of these profiles might then have more success in attracting potential romantic partners. Yet, there is no research that investigates how perceived originality in online dating profiles affect impression formation and how it is constituted in profile texts. To investigate this, the present study contains a perception study and a content analysis.

The goal of the perception study is to investigate the relation between perceptions of profile text originality, personality traits, and attractiveness. More specifically, it is examined whether the

relationship of perceived profile text originality on impressions of attractiveness and dating intention is mediated by perceptions of personality traits considered more and less attractive in romantic partners, namely intelligence, sense of humor, and oddness. To investigate this, a large sample of dating site users were presented with a number of a total of 308 authentic dating profile texts. Participants assessed the profiles' originality, the profile owners' perceived attractiveness, and their intention to date the profile owner, and rated the profile owners on the mediation variables.

In the content analysis, we then try to identify the characteristics that are predictive of profile texts that are perceived as original. Research suggests that original texts should be different from what others write (novel) but should also be socially meaningful (appropriate; Sternberg & Lubart, 1999), and that texts can be original in *what* is written (meaning) and/or *how* the text is written (form; e.g., Jones, 2015). For that reason, both meaning and form characteristics were included in the analyses. All profile texts of the perception study were both manually and automatically coded on a number of features that could be indicative of perceived text originality. Online daters' originality scores given to the texts were then used to examine what characteristics resulted into increased perceptions of profile text originality.

Taken together, this study adds to the current literature on online dating, but the implications of the current study may also more broadly contribute to theory on (perceived) originality in texts. Results of the perception study provide insights on whether people in general agree on what texts are original, and to what extent the perceived originality of a text affects others' perceptions of the text's writer. Results of the exploratory content analysis reveal whether it is possible to identify characteristics that make a text appear original, and whether perceived text originality is a multifaceted construct that is manifested by characteristics of meaning and form.

Background

For profile owners, dating profiles seem to have two related purposes: to display an attractive self and to catch the attention of potential partners (e.g., Markowitz et al., 2018). The free-text component of dating profiles, in the form of profile texts, can be used to serve either of the goals. On web-based dating sites, the profile text is often created in a section called "About me" or "Who am I?", in which profile owners are asked to describe themselves in their own words (Finkel et al., 2012), for example by writing about their occupation, personality, favorite interests and activities, and desired relationship partner and relationship goals (Whitty, 2008).

An original text on a profile is one way to attract attention and to positively affect impressions. But from both the perspective of profile owners and profile observers, originality can potentially be a concern as well (Ellison et al., 2006; Masden & Edwards, 2015; Whitty, 2008). Profile owners have

indicated they struggle with balancing a desire to stand out with the need to blend in (Ellison et al., 2006). Dating profile observers, on the other side, mentioned in interview studies that the lack of originality and novelty and the (over)abundance of clichés may lead to negative attitudes towards profiles and their owners (Masden & Edwards, 2015; Whitty, 2008). Various dating sites address this concern, and advise their users to write creative and unique profile texts. For example, on their website, the dating platform eHarmony (n.d.) states “users whose profiles are heavy on the clichés tend to get fewer messages and responses than those whose profiles show thought, originality, and a genuine sense of humor.”

The vast majority of profile texts are still perceived as cliché-ridden and generic (Masden & Edwards, 2015; Whitty, 2008; Wobcke et al., 2015) and show a high level of predictability (Coupland, 1996). Most profile owners present similarly (selective) information in which common attributes, such as self-descriptions of being spontaneous and kind, and common interests and activities are emphasized (e.g., love to laugh and travel, like to sip wine by fireplaces, go for romantic strolls on the beach; Masden & Edwards, 2015; Whitty, 2008). To be more original in their profile text, therefore, profile owners could write texts that are novel and differ (in some way) from what is generally seen, both regarding the (personal) information that is provided and in the phrasing, word and stylistic choices that are made.

Such highly generic profiles full of clichés often lack novelty, but are simultaneously highly appropriate (i.e., they follow all conventions regarding these texts). Appropriateness is the other important dimension that influences originality (Sternberg & Lubart, 1999). What is appropriate highly depends on shared expectations, conventions, and norms that have emerged over time in the specific context of online dating profiles, which simultaneously generates assumptions about what (linguistic) behavior is unexpected (Ellison et al., 2012). Following the expectation violations theory of Burgoon and Jones (1976), profile texts that do not conform to existing conventions, such as those that do not contain any personal information, negatively violate (social) expectancies and norms (Gibbs et al., 2011). Such unexpected behavior can, in turn, negatively affect impression formation, for instance with regard to general favorability (D’Angelo & Van der Heide, 2016). It thus seems that the originality of a profile text may positively affect impressions that others form about the profile owner’s attractiveness, but only so long as it happens within the boundaries of the novelty and appropriateness dimensions.

The positive correlation between creativity and the personality traits intelligence and sense of humor may be one of the mechanisms behind this positive effect of originality (e.g., Kaufman et al., 2008; Miller, 2000). It has been argued that to be creative at least a moderate level of (verbal) intelligence is necessary (Gao et al., 2017). Research even suggests there is a substantial overlap between cognitive intelligence and creativity (Kaufman et al., 2008; Sternberg, 1985), with intelligent

people being better at self-expression and language play (Proyer & Brauer, 2018). Gao and colleagues (2017) examined this in a dating context and found that women were more willing to date men who used metaphorical language to compliment their appearance than those using literal language. Men producing metaphorical compliments did not only score higher on a verbal intelligence test, but they were also perceived as more intelligent (Gao et al., 2017).

Besides increased positive perceptions of intelligence, the perceived originality of a profile text may also enhance positive perceptions about a profile owner's sense of humor. Online daters use humor in their profile texts as a strategy to appear unique and more creative (Whitty, 2008). Positive correlations have been found between perceptions of creativity and sense of humor (e.g., Kaufman et al., 2008; Kaufman & Kozbelt, 2009; Miller, 2000). It has been suggested that since humor and creativity share many features, such as playfulness and risk taking, humor can even be seen as a subset of creativity (Murdock & Ganim, 1993). Therefore, some level of (verbal) creativity is required to generate humor (e.g., Greengross & Miller, 2011; Miller, 2000).

Both intelligence and sense of humor are, in turn, important determinants when assessing the attractiveness of a potential partner (e.g., Li et al., 2002; Regan et al., 2000). Also in an online dating context, it has been shown that owners of profiles that appear to be more intelligent (Chapter 3) and humorous (e.g., Wilbur & Campbell, 2011) are deemed more desirable relationship partners. In all, we pose the following two hypotheses:

H1. Perceived profile text originality increases perceptions of profile owners' intelligence which, in turn, positively affect perceptions of profile owners' attractiveness and dating intention.

H2. Perceived profile text originality increases perceptions of profile owners' sense of humor which, in turn, positively affect perceptions of profile owners' attractiveness and dating intention.

However, in the context of online dating, where presenting the (attractive) self to potential romantic partners is the foremost purpose of profiles, the appeal of coming across as original may be constrained by the need to stick to conventions: daters' expectations about the kind of profile cues that are appropriate and meaningful have to be taken into account as well (Ellison et al., 2012). As such, it may be expected that writers of profile texts that do not satisfy the appropriateness criteria, for example when regular conventions are extended, may come across as odd. Oddness here refers to owners of profiles that score high on perceived strangeness, eccentricity, and peculiarity (e.g., Ashton & Lee, 2012; Simms et al., 2008; Runco, 2009; Weeks & Ward, 1999) by "acting and thinking in creative and unusual ways which sets them apart from their more conventional peers" (Zibarras et al., 2008, p. 205).

Once a profile owner does not conform to social expectations and norms in a particular situation or context, this can guide impression formation, such as about the person's social skills. In the online dating context, profile owners who deviate too much from others in how they textually present themselves may be evaluated as being peculiar in their way of thinking. More specifically, if a profile text deviates to such an extent that it is no longer appropriate and useful in the dating context, this may suggest that this person also behaves distinctively in other situations, such as in face-to-face encounters or in later relationship stages. This can negatively affect the predictability of the anticipated behavior of these profile owners, which is considered uncomfortable and undesirable in dating contexts (e.g., Buss, 1989; Buss & Barnes, 1986). Indeed, in the context of flirting behaviors in public settings (e.g., in a club), White and colleagues (2018) found that the percentage of participants favoring unexpected behavior of potential romantic partners (8.11% of the participants; e.g., a person reciting Shakespeare to the participant) was lower compared to those who preferred highly expected behavior (57.12% of the participants, e.g., a person adding the participant on Instagram). This leads to the following hypothesis:

H3. Perceived profile text originality increases perceptions of profile owners' oddness which, in turn, negatively affect perceptions of profile owners' attractiveness and dating intention.

In the second part of this study, we investigate the specific characteristics that determine perceived originality in texts. Research is scarce on what exact characteristics increase perceptions of originality in dating profile texts, but previous research has highlighted that both meaning (or content) and form (or style) can determine text originality (e.g., Berger & Packard, 2018; Form, 2019; Simonton, 1989). De Saussure (1916) was one of the first linguists who posed that in language, meaning (the "signified") and form (the "signifier") together convey a communicative message (the "sign"). It is expected that perceived originality in online dating profile texts is also manifested through both characteristics of meaning and form.

Meaning involves the content that is provided or the concept that is represented, which also includes the (type of) topics that are discussed in a text. For example, previous research has shown that in (popular) sonnets and song lyrics characteristics such as a wide range of different topics and including highly specific and rare topics – in relation to other texts in the genre – can be indicative of originality (Berger & Packard, 2018; Simonton, 1986; 1989; 2009), and we conjecture that comparable meaning features increase perceptions of originality in dating profile texts.

Form refers to the language style that is used to make meaning. Various forms can be used to describe specific content or a concept: "I'm looking for my other half" and "I hope to find someone to fall head over heels for" are two other forms to express "Looking for a (long-term) relationship

partner”. Writers’ choices in form and style may also enhance a text’s imagery and vividness, which is another important attribute that has been associated with originality (e.g., Lindauer, 2009). Earlier research found that the popularity of original work is negatively associated with imagery of abstract ideas and concepts and positively associated with imagery of concrete experiences, sensations, and desires (Simonton, 1989, 2009). Examples of form characteristics that could evoke readers’ affect, images, and other sensory inputs are the use of more unique and concrete words, and more metaphors and other figures of speech (Gao et al., 2017; Jones, 2015; LeBoutillier & Marks, 2003; Simonton, 2009). Similar form characteristics may be observed in dating profile texts that are perceived original.

In addition to the perception study, in which we test our hypotheses based on participants’ evaluations of profile text originality and profile owner’s personality and attractiveness, this study also examines more exploratory what specific text characteristics increase perceptions of profile text originality. To do so, we use the originality ratings given to all 308 texts in the perception study to construct a codebook with a number of features that may be indicative of perceived profile text originality. These 308 profile texts are then coded on those features. By doing so, we aim to answer the research question for the content analysis part of this study, which is: What characteristics in online dating profile texts increase perceptions of profile text originality?

Both the perception study and content analysis of this chapter are preregistered on OSF and can be found at osf.io/yms83/registrations. Ethical clearance for the study was obtained in Spring 2020 from the Research Ethics and Data Management Committee of Tilburg School of Humanities and Digital Sciences.

Perception Study: Effects of Perceived Profile Text Originality

Method

Participants

1234 participants took part in the perception study, all with an account on one of the two dating sites with whom we collaborated for this study. The collaborating dating sites were: 50PlusMatch, which presents itself as a dating site for active people of 50 years or older, and Pepper, a general-purpose dating site. From all participants, 1153 were members of 50PlusMatch (93.4%) and 81 of Pepper (6.6%).¹ The mean age of the participants was 63.5 years ($SD = 12.1$). Almost half of them indicated to be female (47.2%), and 96.4% indicated to feel mostly attracted to the opposite sex. More than half of the participants had a vocational or high school level degree (54.7%), and 44.7% had obtained a college degree. Dutch was the native language of 96.9% of the participants.

Both sites assisted with participant recruitment but were not involved in any further aspects of the study, such as the experimental setup or the study outcomes. Participation was on a voluntary basis. The participants could participate in a raffle for ten vouchers of a three-months free membership of the dating site.

Materials

To construct the materials for this study, 308 profile texts were selected from a sample of 31,163 dating profiles from two existing Dutch dating sites (other sites than the participants' sites). These profiles were written by people with different ages and education levels. A large subset of the sample were profiles from a general dating site, the remainder were profiles from a site with only higher educated members (3.25%). In March 2017, the profiles in this sample were automatically extracted with the online tool Web Scraper. Only the first 500 characters of the profiles were extracted to create a sample in which text length variation was limited. Profiles were not included in the sample if they contained less than ten words, were written fully in another language than Dutch, or included only the general introduction generated by the dating site.

A preliminary scan of the profile texts by the authors showed little variation in originality among the vast majority of texts, with most texts containing fairly generic self-descriptions of the profile owner. Therefore, a random sample from the entire corpus was likely to result in little variation in perceived text originality scores, making it difficult to examine how variation in originality scores affects other impressions. As we aimed for a sample of profile texts that was expected to vary on (perceived) originality, the texts' TF-IDF scores were used as an initial proxy of originality. TF-IDF, short for Term Frequency-Inverse Document Frequency, is a measure often used in information retrieval and text mining (e.g., Salton & Buckley, 1988), which calculates how often each word in a text appears compared to the frequency of this word in other texts in the sample. For each word in a profile text, a TF-IDF score was calculated, and the average of all the word scores of a text was that text's TF-IDF score. Texts with high average TF-IDF scores thus included relatively many words not found in other texts, and were expected to score higher on perceived profile text originality, whereas the opposite was expected for texts with a lower average TF-IDF score. Figure 5.1 presents examples of profile texts with a high TF-IDF score (Dutch version that was part of the study material in (a) and the version translated in English in (b)) and a low TF-IDF score (profiles (c) and (d)). Looking at the (un)usualness of word use is a commonly used approach to indicate a text's originality (e.g., Form, 2019; Simonton, 1989), and TF-IDF indeed seemed a suitable proxy of text originality as in general the calculated scores resembled what we expected would be texts considered more and less original. The profiles in Figure 5.1 illustrate this, as profile (a) is more likely to score high on perceived text originality than profile (c).

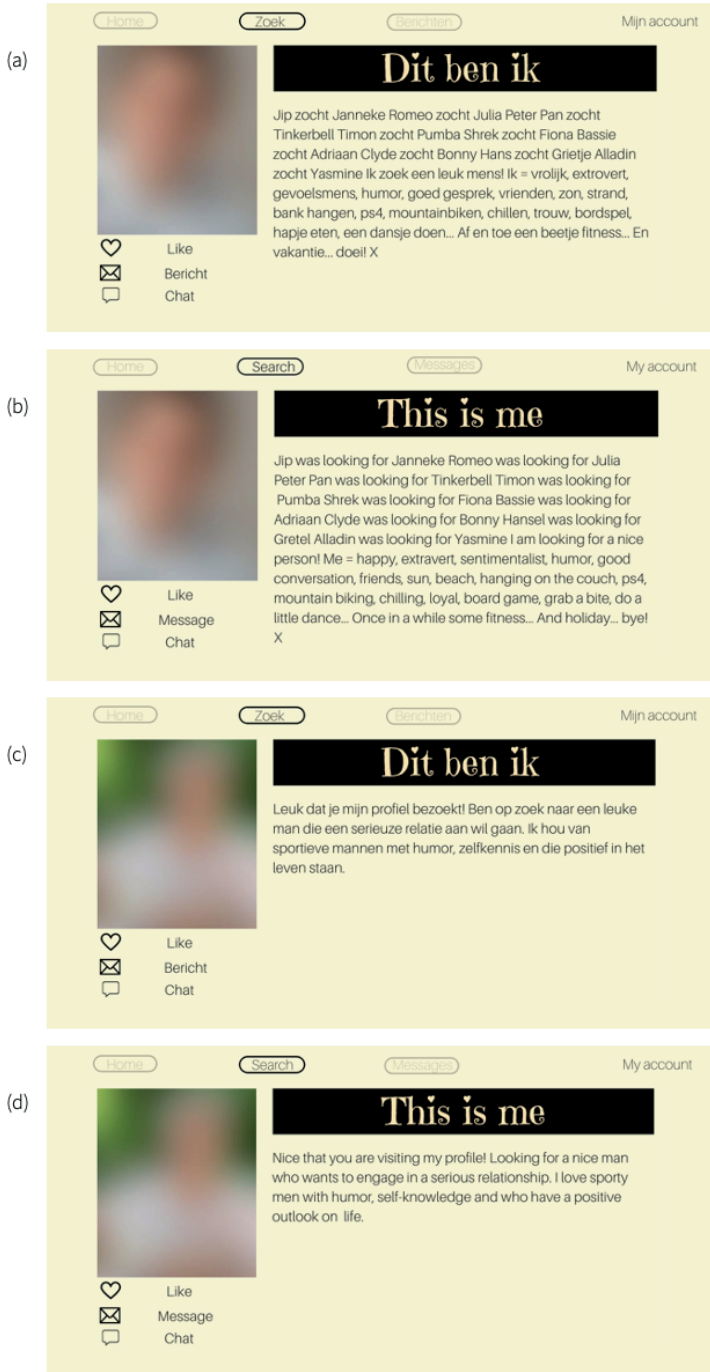


Figure 5.1 Examples of the original Dutch dating profiles used for the perception study (a, c) and translated English versions (b, d). Profiles (a) and (b) are male profiles with a high TF-IDF score (bin seven), and (c) and (d) are female profiles with a low TF-IDF score (bin one).

The TF-IDF score distribution corroborated the initial impression that only few texts were original in their word use, which is illustrated in Figure 5.2. All 31,163 texts were therefore divided into seven bins, based on the percentiles of the TF-IDF score. This was done for both texts that were written by people who indicated to be men ($n = 17,869$) and for those who indicated to be women ($n = 13,294$), as participants in the perception study saw profiles written by people of their sexual preferences. The seventh bin – containing the texts with the highest TF-IDF scores – contained all texts falling in the range until the 40% percentile of TF-IDF scores. Each of the other bins contained all texts within the next 10th percentile. To illustrate this for the texts written by men: the highest TF-IDF score was 11.19 and the lowest score 2.15, which means that for texts of men the TF-IDF scores in a bin differed 0.90 ($11.19 - 2.15/10$). As such, all texts that scored between 2.15 and 3.06 were part of the first bin (the lowest score plus 0.90), and those scoring between 3.06 and 3.96 were part of the second bin (3.05 plus 0.90), and so on. Table 5.1 provides for the profiles in each of the bins the lowest and highest TF-IDF score, the percentile score, and the number of profiles included.

To end up with a total of approximately 300 profile texts, 22 texts were randomly selected from each of the seven bins, resulting in a total of 154 texts written by men and 154 by women, that is, 308 texts altogether.

All 308 texts were then pseudonymized, which means that identifiable information was swapped with information from other profile texts or replaced by comparable information (e.g., “My name is John” became “My name is Ben” and vice versa, and “bear55” became “teddy56”). Texts that could not be pseudonymized ($n = 5$) or included references to pictures ($n = 2$) were replaced by another random text taken from the same bin. If the text ended in an incomplete sentence, caused by the fact that maximally 500 characters had been retrieved, this sentence fragment was removed.

All 308 profile texts were accompanied by a different blurred profile picture, which was a picture of a person with the same sex as the text’s writer. The texts and pictures were then combined into one dating profile. The layout of the profiles is exemplified in Figure 5.1. Since the texts we used for our materials included parts of authentic profile texts, the profiles that we have used in this study are available upon request (see osf.io/yns83/).

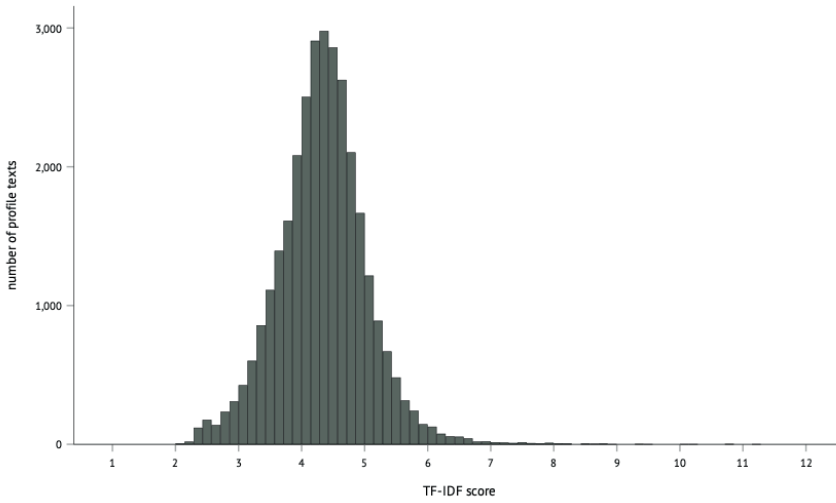


Figure 5.2 Distribution of the TF-IDF scores of all 31,163 profile texts in the sample.

Note. Higher TF-IDF scores reflect more variation in word use in that text compared to other texts.

Table 5.1 Distribution of Texts Written by Men and Women in Seven Bins Based on Percentiles of the TF-IDF Scores.

Bin	Percentile	Profile texts written by men			Profile texts written by women		
		Lowest TF-IDF score	Highest TF-IDF score	n	Lowest TF-IDF score	Highest TF-IDF score	n
1	0 to 10th	2.151	3.055	665	2.053	2.789	213
2	10th to 20th	3.055	3.958	4,125	2.789	3.525	1,271
3	20th to 30th	3.958	4.862	9,341	3.525	4.260	4,657
4	30th to 40th	4.862	5.765	3,225	4.260	4.996	5,479
5	40th to 50th	5.765	6.669	409	4.996	5.732	1,400
6	50th to 60th	6.669	7.572	72	5.732	6.468	203
7	60th to 100st	7.572	11.186	665	6.468	9.412	71
Total			17,869				13,294

Note. *n* indicates the number of profile texts included in the bin in that percentile.

Procedure

The perception study was conducted online and took approximately ten minutes to complete. First, participants were welcomed and informed about the procedure of the study, and answered a few demographic questions (e.g., gender, age). Based on their indicated sexual preference, participants

were then presented with five profiles that were randomly chosen from the selection of 154 profile texts written by men or women. Since participants were informed that they could end the study at any time, not all participants evaluated five profiles. Participants saw one profile at a time; after each profile, participants assessed the originality of the profile and were asked about perceptions of profile owner's personality traits (intelligence, sense of humor, oddness) and attractiveness (physical, social, romantic attractiveness). Before the next profile was presented, participants answered with a yes/no question whether they would like to go on a date with the profile owner. Finally, the participants who ran through the entire study were thanked, debriefed, and allowed to leave comments, and were then redirected to the contact form of the dating site which they could fill in if they had interest in participating in a raffle for a three-months free membership. This raffle was carried out by the dating sites.

Measures

Except for intention to date, all variables in this study were measured on a Likert scale from 1 (*completely disagree*) to 7 (*completely agree*). Intention to date was measured using one binary yes/no question: "I would like to go on a date with this person". The study's independent variable was perceived profile text originality, which was measured with the item "This profile text seems original to me". All other items were predominantly derived from existing scales, with the wording translated and slightly adjusted to fit our study.

Each of the three mediation variables of this study was measured by two items. Perceived intelligence was measured with the items "I think this person is smart/intelligent" (based on Leach et al., 2007; Pearson's $r = .83$), perceived sense of humor with the items "I think this person has humor/is funny" (following Brand et al., 2012; Pearson's $r = .82$), and perceived oddness was measured with the items "I think this person is odd/peculiar" (following Simms et al., 2008; Ashton & Lee, 2012; Pearson's $r = .77$).

The outcome variables of attractiveness were measured with three items, each covering another dimension of perceived attractiveness: physical attractiveness ("I think this person is good-looking"), social attractiveness ("I think this person is kind"; McCroskey & McCain, 1974), and romantic attractiveness ("I could fall for this person"; Campbell, 1999).

Statistical Analysis

All participants that rated at least one dating profile from the full set of 308 profiles were included in the dataset, with a maximum of five profiles ($M = 2.95$, $SD = 1.50$).² This resulted in a total of 4289 individual profile assessments. The 308 texts differed in the number of times they were rated, ranging between 7 and 20 ratings per text ($M = 14.10$, $SD = 2.56$). With the irrNA package in R (Brückl & Heuer, 2018), intraclass correlation coefficients (ICC; 1, k) were calculated for all seven impression formation

variables, providing an indication of the internal consistency of the scores given to the different texts by the different participants. All ICC's were between .66 and .85 ($ICC_{\text{mean}} = .80$), indicating a good reliability between scores given by participants (Koo & Li, 2016). Consequently, data was aggregated on text level and mean scores were calculated for each of the variables. For dating intention, which was measured with a dichotomous yes/no question, the mean score for all texts ranged between 0 and 1, with higher scores indicating more willingness to date the profile text writer.

To test the mediation hypotheses, we used the PROCESS v3.1 macro in SPSS (Hayes, 2013; model 4) with a bootstrapping approach with 10,000 samples and 95% Monte Carlo confidence intervals. The independent variable was the perceived profile text originality score. Perceived physical, social, and romantic attractiveness and dating intention were the dependent variables; perceived intelligence, sense of humor, and oddness were the mediating variables. The data underlying this article are available on OSF, at: osf.io/yms83/.

Results

Before conducting mediation analyses, a multivariate regression model revealed that perceived text originality significantly predicted all seven mediating and outcome variables, $F(7, 300) = 87.41$, $p < .001$, $\eta_p^2 = .671$. Table 5.2 provides all mean scores, standard deviations, and correlation scores of perceived text originality scores and the mediating and outcomes variables.

Table 5.2 Means, Standard Deviations, and Correlations among Perceived Text Originality Scores and All Impression Formation Variables.

Variable	Mean (SD)	1	2	3	4	5	6	7
1. Text originality	3.69 (0.91)							
2. Intelligence	3.93 (0.69)	.74						
3. Humor	3.83 (0.56)	.73*	.64*					
4. Oddness	3.59 (0.64)	-.30*	-.33*	-.31*				
5. Physical attractiveness	3.79 (0.41)	.51*	.61*	.59*	-.30*			
6. Social attractiveness	4.25 (0.51)	.60*	.61*	.68*	-.59*	.63*		
7. Romantic attractiveness	3.32 (0.82)	.61*	.66*	.65*	-.61*	.63*	.77	
8. Intention to date	0.30 (0.20)	.60*	.62*	.58*	-.52*	.56*	.67*	.83*

Note. * $p < .01$. All variables were measured on a seven-point Likert scale, except for 'intention to date' which was measured using a dichotomous yes (1)/no (0) question.

Hypothesis 1 proposed that perceived profile text originality increases perceptions of profile owners' intelligence which, in turn, positively affect perceptions of profile owners' attractiveness and dating intention. Results indicated that perceived text originality was indeed a significant predictor of perceived intelligence: owners of profile texts that scored higher on perceived originality also received higher scores on perceived intelligence, $b = 0.56$, $SE = 0.03$, $p < .001$, CI: 0.50, 0.61. Perceived intelligence was a significant predictor of physical, $b = 0.24$, $SE = 0.04$, $p < .001$, CI: 0.16, 0.32. social, $b = 0.13$, $SE = 0.04$, $p = .001$, CI: 0.05, 0.20, and romantic attractiveness, $b = 0.35$, $SE = 0.06$, $p < .001$, CI: 0.23, 0.47. In addition, participants were more willing to date profile owners they perceived intelligent, $b = 0.08$, $SE = 0.02$, $p < .001$, CI: 0.04, 0.11. The data thus confirm H1.

The second hypothesis stated that perceived profile text originality positively affects attractiveness perceptions and dating intention through higher humor perceptions. As hypothesized, higher scores on perceived profile text originality significantly predicted higher scores on humor perceptions, $b = 0.45$, $SE = 0.02$, $p < .001$, CI: 0.40, 0.50. Perceived humor was, in turn, a significant predictor of physical, $b = 0.27$, $SE = 0.05$, $p < .001$, CI: 0.18, 0.37, social, $b = 0.38$, $SE = 0.05$, $p < .001$, CI: 0.29, 0.47, and romantic attractiveness, $b = 0.46$, $SE = 0.07$, $p < .001$, CI: 0.31, 0.60, as well as of dating intention, $b = 0.06$, $SE = 0.02$, $p = .003$, CI: 0.02, 0.10. H2 is thus supported.

Hypothesis 3 posed that perceived profile text originality increases profile owners' perceived oddness which, in turn, negatively affect perceptions of profile owners' attractiveness and dating intention. In contrast with H3, higher profile text originality scores led to lower scores on perceptions of profile owners' oddness, $b = -0.21$, $SE = 0.04$, $p < .001$, CI: -0.28, -0.13. Higher perceptions of oddness did have a negative effect on perceptions of social attractiveness, $b = -0.31$, $SE = 0.03$, $p < .001$, CI: -0.37, -0.26, romantic attractiveness, $b = -0.52$, $SE = 0.05$, $p < .001$, CI: -0.61, -0.43, and dating intention, $b = -0.10$, $SE = 0.01$, $p < .001$, CI: -0.08, -0.13, but not on physical attractiveness, $b = -0.05$, $SE = 0.03$, $p = .087$, CI: -0.11, 0.01. H3 is thus not supported by the data: higher scores on perceived oddness negatively affect perceived attractiveness and dating intention, but profile owners whose text scored higher on perceived text originality scored lower on oddness. Figure 5.3 shows the results of the mediation analyses for all three attractiveness dimensions and intention to date.³

After controlling for the mediators, perceived text originality is no longer a significant predictor of all three attractiveness dimensions, indicating full mediation (physical attractiveness: $b = -0.04$, $SE = 0.03$, $p = .268$, CI: -0.10, 0.03, social attractiveness: $b = 0.03$, $SE = 0.03$, $p = .385$, CI: -0.04, 0.09, romantic attractiveness: $b = 0.03$, $SE = 0.05$, $p = .500$, CI: -0.07, 0.13). The mediators partially mediate the effect of perceived profile text originality on dating intention, as the direct effect is still significant after controlling for the mediators, $b = 0.04$, $SE = 0.01$, $p = .007$, CI: 0.01, 0.07.

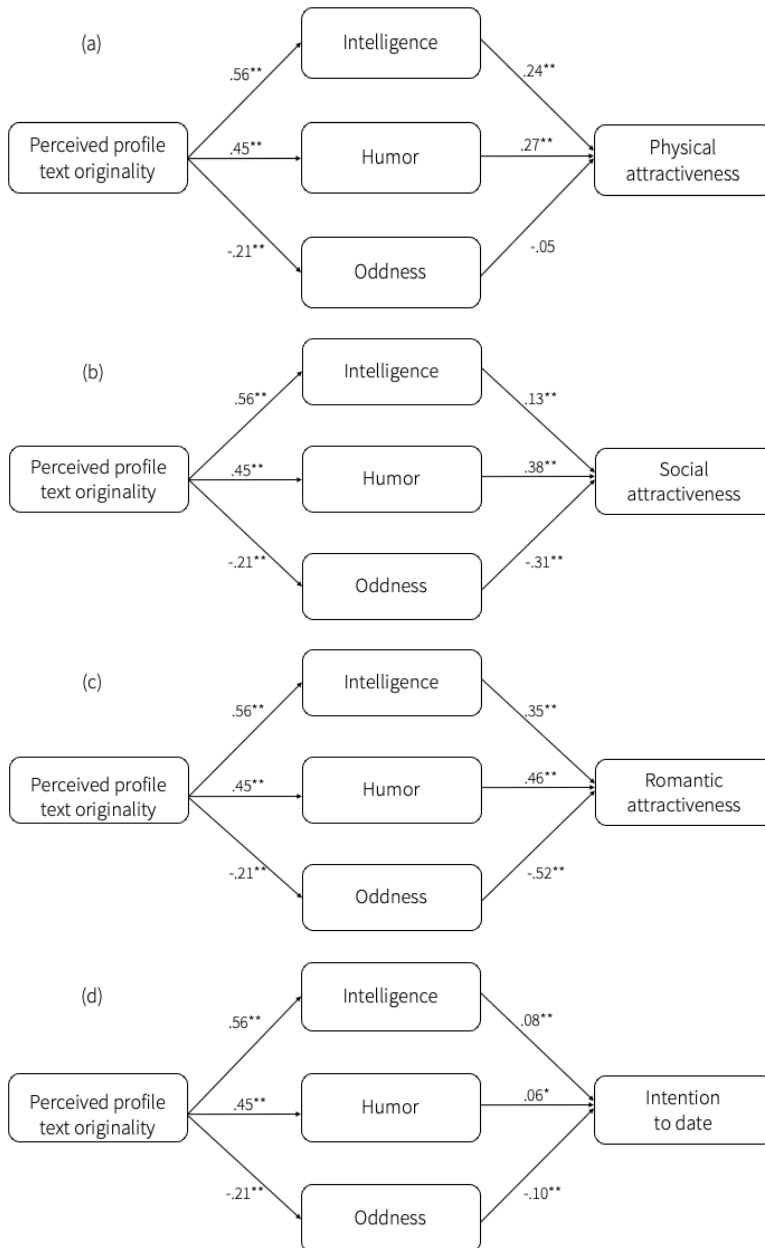


Figure 5.3 Results of the four mediation analyses displaying that the effect of perceived profile text originality on (a) physical attractiveness is mediated by perceived intelligence and humor, and that the effect of profile text originality is mediated by perceived intelligence, humor, and oddness for (b) social attractiveness, (c) romantic attractiveness, and (d) dating intention, but for oddness in the opposite direction than hypothesized. The coefficients represent the unstandardized coefficients.

Note. ** $p < .001$, * $p < .01$. All variables were measured on a seven-point Likert scale, except for 'intention to date' which was measured using a dichotomous yes (1)/no (0) question.

Discussion

The perception study showed, as predicted, that perceived profile text originality affects impression formation. Owners of profiles scoring higher on perceived text originality were evaluated as more intelligent and humorous and, in turn, as more attractive, supporting H1 and H2. However, in contrast to our expectations, higher text originality scores negatively affected perceptions of profile owner's oddness. H3 was not supported: Higher scores on perceived oddness had a negative impact on attractiveness, but owners of more original profiles were not seen as more, but as less, odd.

These data showed that, overall, perceptions of profile text originality positively affect impressions of the profile owner's personality and attractiveness. However, these results do not show which specific features of the profile text affect perceptions of originality. Therefore, we now turn to a content analysis to identify which profile text characteristics increase perceptions of text originality.

Content Analysis: Textual Characteristics of Profiles Perceived as Original

Method

In this section, we describe the two stages of the coding procedure that were undertaken in this exploratory analysis to answer the research question on the textual characteristics that predict perceived profile text originality. This section first reports on the qualitative analyses we did to compile a codebook consisting of several main categories that were captured by different features, followed by a more detailed description of the content analysis stage in which all 308 profiles were coded on the 15 features of the codebook. The entire codebook can be found in the Appendix at the end of this chapter.

Qualitative Analysis

In the first stage of the coding procedure, we conducted a qualitative analysis of a subselection of 60 of the 308 profile texts, differing in perceived originality scores: the 20 texts that scored highest on perceived profile text originality (range: 5.69 - 5.00; $M = 5.29$, $SD = 0.21$), those 20 that scored lowest (range: 2.27 - 1.25; $M = 1.88$, $SD = 0.30$), and the 20 texts that scored closest to the mean originality score of 3.69 (range: 3.75 - 3.63, $SD = 0.91$).

Initially, I openly coded the 60 texts in order to identify patterns and themes among texts within a group, or differences between the three groups of texts. After discussing these patterns and themes among the authors and returning to the data to reflect on the initial analysis, a codebook was constructed in which three main categories of text characteristics were distinguished: stylistic features, self-disclosure, and perspective-taking. Each of these categories was captured with a number of features which are explained below.

First, we observed that texts that scored higher on perceived originality more often contained stylistic characteristics such as vivid descriptions and imagery than less original texts. As opposed to less original texts, original texts seem to be more likely to contain metaphorical expressions (e.g., “I am a very good cook” vs. “I am a star in the kitchen”), and particularly novel metaphors (e.g., “I don’t like growers of crops situated between nose and neck”). In addition, original profile texts seem to include more low-frequent words, adjectives, and adverbs than less original texts, which are other features that can evoke imagery. These five stylistic features are thus included in the codebook as features potentially predicting perceived profile text originality.

Second, the qualitative analysis suggested that texts high in perceived originality contain more self-disclosure statements than texts scoring lower on perceived originality. In our preliminary analysis, we saw that self-disclosure was presented in several ways. First, original texts seemed to contain both more (e.g., “I’m a 50-year old man” vs. “I’m a loyal 50-year old man with a high sense of humor”) and more intimate self-disclosure statements (e.g., “I often go to the gym” vs. “In my life, sharing is the keyword”). Moreover, self-disclosure statements in original profile texts also appeared more concrete compared to less original profiles, which means revealing personal information that activates detailed (image-based) representations of objects or events (West & Holcomb, 2000; e.g., “Food is essential for me” vs. “Coffee and a cracker with cheese or jam are essential in my morning ritual”). As additional features of self-disclosure, we decided to take into account the number of words and the percentage of I-references, which are also associated with self-disclosure (Chapter 2; Gibbs et al., 2006), as well as article use, which is seen as another measure of language concreteness (Tausczik & Pennebaker, 2010). A total of six self-disclosure features is thus added to the codebook.

Third, profiles scoring high on perceived originality seemed to be less self-focused and more focused on the other. First, some original texts were partially or completely written from another perspective: these profile owners also used another person’s perspective or another person’s quotes to present themselves (see Figure 5.1a, c for an example). Second, we noticed that original texts seemed to contain more information about the kind of relationship (partner) the profile owner was looking for (e.g., “I’m looking for an intelligent man with a sense of humor”). Moreover, we took into account the percentage of question marks and you-references as these can be indicators of the profile writer’s attention being directed to the potential partner and not just the self (Chapter 2).⁴ These four perspective-taking features are therefore included in the codebook.

Content Analysis

In the second stage, all 308 texts, including the 60 texts analyzed in the initial phase, were coded on all 15 features defined in the codebook, of which seven were coded manually and eight automatically. For the manually-coded features, two judges who were blind to the perceived profile text originality

score coded a random subset of texts ($n = 30$). We used the Kappa statistic to calculate the intercoder reliability and used the benchmark of Landis and Koch (1977) to determine strength of agreement. One coder then went on to individually code the remaining profiles. Manual coding happened on two levels: profile perspective was coded on the level of the profile text, but since multiple stylistic and self-disclosure features could occur within a text – and even a single sentence – these features were coded at clause level. A clause was identified as the smallest unit in a sentence that was interpretable on its own. Parts of enumerations and elliptical expressions (e.g., “philosopher, adventurous”, “no standard man”) were considered as separate clauses. Profile texts consisted on average of 7.3 clauses ($SD = 5.9$). Clauses that were (part of) quotations of others ($n = 16$ texts with (only) citations) were not coded on stylistic and self-disclosure features (e.g., John Weir’s quote “Love myself I do. Not everything, but I love the good as well as the bad”). For automatic coding, we used the Linguistic Inquiry and Word Count program (LIWC; Pennebaker et al., 2015) and T-Scan, a software tool for analyzing Dutch texts (Pander Maat et al., 2014).

Stylistic features. Of the five stylistic features, two were manually coded: presence of (1) fixed and (2) novel metaphors (κ 's of .80 and .87, respectively). Fixed and novel metaphors were included as a binary variable (0 = absent, 1 = present) because the relatively short profiles resulted in little variation in the number of occurrences. Proportions of adjectives, adverbs, and low-frequent words were automatically coded, with low-frequent words defined as the proportion of words not part of the 20,000 most frequent Dutch words, derived from the SoNar corpus (Oostdijk et al., 2013). Because the TF-IDF score signals variation in the words used in a text compared to the other texts, TF-IDF score was also taken into account as a stylistic feature.

Self-disclosure features. Three of the six self-disclosure features were coded manually. Each clause in which a profile owner reveals personal information was coded as a self-disclosing clause, and each self-disclosure clause was manually coded on three features. First, within one clause, the total number of self-disclosing expressions were counted, which involved only information about the profile owner him- or herself (e.g., underlined words indicate the four self-disclosing statements in “I’m a loyal 50-year old man with a high sense of humor”) and not the type of relationship (partner) the profile owner was looking for (e.g., “My future partner should be funny and smart”).

Second, the intimacy of the self-disclosed information was coded ($\kappa = .76$). To do this, we followed the classification scheme of Altman and Taylor (1973) adapted by Sharabi and Dykstra-DeVette (2019) for dating contexts. Each self-disclosure clause was coded as containing either biographical (low intimate; e.g., name, age), evaluative (medium intimate; e.g., personality traits, hobbies), or normative/moral personal information (high intimate; e.g., norms and values, confessions). All self-disclosing statements and intimacy scores (1, 2, 3) in self-disclosing clauses of a

text were summed to calculate the total number of self-disclosing statements and the overall intimacy score of a text.

The third feature within this category was the concreteness of self-disclosed information ($\kappa = .81$). To be identified as concrete, information in a profile should evoke clear imagery. For instance, by describing an assignable location (e.g., “A road trip across Australia is on my bucket list”), product (e.g., “My favorite book is Harry Potter”), activity (“I prefer mountain biking to Nordic walking”), period or moment (e.g., “I got divorced in 1999”). This could also involve information that specifies information in other (generic) self-disclosing clauses, such as the second clause on sushi in “I love cooking. Home-made sushi is my specialty”, which further specifies the information disclosed about the profile owner’s love to cook. Because of the low number of occurrences within texts, concreteness was included in the analyses as a binary variable (absent or present).

The remaining three features related to self-disclosure were coded using LIWC: the number of words, and the percentage of I-references and articles in the profiles.

Perspective-taking features. First, profile perspective was coded on profile text level. Self-perspective profiles were those profiles that were (fully) written from the profile owner’s own perspective (e.g., “I am a nice man and I would like to meet a friendly woman”; see also Figure 5.1c, d), while profiles that were not (fully) written from the self- but also from another perspective were coded as no self-perspective (see also Figure 5.1a, b; all κ ’s $> .63$). For instance, profiles that were written from a 3rd person perspective (“This nice man would like to meet a friendly woman”). Second, we coded the number of clauses that included information about the kind of relationship (partner) a profile owner is looking for ($\kappa = .87$), but given the low frequency in which this occurred, we eventually included the feature as a binary variable (absent or present). The percentage of question marks and you-references were automatically calculated using LIWC.

Results

All mean scores, standard deviations, and correlation scores of the perceived text originality scores and all 15 included features are provided in Table 5.3 on the following page. We found that profiles were more likely to include (at least) one fixed metaphor ($n = 132$; 42.9%) than a novel metaphor ($n = 95$; 30.8%). The proportion of low-frequent words, adjectives, and adverbs in the profiles was relatively low, with 0.85, 0.12, and 0.06, respectively. Results of the self-disclosure features showed that profiles included 53.9 words on average, in which profile owners expressed on average 9.17 self-disclosing statements. In somewhat more than half of the profiles, concrete self-disclosing information was provided ($n = 161$; 52.3%). In addition, the percentage of articles and I-references in the profiles was 6.88 and 5.81, respectively. A large majority of profiles were fully written from the profile owner’s own perspective ($n = 242$; 78.6%), and in almost half of the profiles no information was

revealed about the type of relationship (partner) the profile owner sought for ($n = 153$; 49.7%). On average, the percentage of you-references was 1.35 and the of question marks 0.48.

Regression Analysis

Table 5.4 presents the results of the hierarchical multiple regression with perceived text originality as the dependent variable. As the amount of self-disclosure and self-disclosure intimacy were highly correlated (.83), this led to multicollinearity issues in our analysis. Therefore, only the total number of self-disclosure statements was included in the analysis. The stylistic features were entered in the regression first, $F(6, 301) = 13.78$, $p < .001$, $R^2 = .215$. Fixed metaphors, novel metaphors, TF-IDF, and low-frequent words all made a significant contribution to this first model (all β 's $\geq .20$ and $\leq .41$, p 's $\leq .002$) and these stylistic features accounted for 21.5% of the variation in originality scores. The self-disclosure features explained an additional 20.9% of the variance, $F(5, 296) = 21.52$, $p < .001$, $R^2 = .209$. Except for the use of I-references, all self-disclosure features contributed significantly to the model (all β 's $\geq .13$ and $\leq .41$, p 's $\leq .023$). Finally, the addition of the perspective-taking features did not add significantly to the model, $F(4, 292) = 1.80$, $p = .128$, $R^2 = .014$.⁵

The final model with all features included reveals seven features significantly predicted perceived profile text originality; number of words was the strongest predictor, $\beta = .415$, $p < .001$, followed by the number of self-disclosing statements, $\beta = .189$, $p = .003$, the presence of concrete self-disclosure, $\beta = .171$, $p = .002$, the use of articles, $\beta = .157$, $p = .008$, and then the presence of: no self-perspective, $\beta = .130$, $p = .024$, novel metaphors, $\beta = .116$, $p = .016$, and fixed metaphors, $\beta = .104$, $p = .030$. Together the features explained 43.8% of the variance in perceived text originality scores.

Table 5.3 Means, Standard Deviations, and Correlations among Perceived Text Originality Scores and All Coded Features.

Category	Feature	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	1. perceived text originality	4.44 (0.91)															
Stylistic features	2. TF-IDF	5.05 (1.78)	.21**														
	3. fixed metaphors ^a	0.42 (0.50)	.24**	-.07													
	4. novel metaphors ^a	0.31 (0.46)	.29**	.18**	.06												
	5. low-frequent words ^b	0.85 (0.18)	.01	-.77**	.13*	-.03											
Self-disclosure features	6. adjectives ^b	0.12 (0.09)	.11	-.03	.20**	.09	.08										
	7. adverbs ^b	0.06 (0.05)	.20**	-.06	.11	.11	.28**	-.01									
	8. number of words	53.9 (26.8)	.56**	.37**	.19**	.28**	-.01	-.09	.31**								
	9. number of self-disclosures	9.17 (8.16)	.45**	.27**	.19**	.16**	-.07	.31**	.13*	.47**							
Perspective-taking features	10. concrete self-disclosure ^a	0.52 (0.50)	.42**	.21**	.09	.13*	-.07	-.03	.15**	.46**	.48**						
	11. article use ^c	6.88 (4.95)	.04	-.37**	-.05	.08	.47**	-.20**	-.01	-.04	-.21**	-.06					
	12. I-references ^c	5.81 (4.28)	-.11	-.49**	-.03	-.17*	.46**	-.13*	-.02	.01	-.10	-.10	.04				
	13. no self-perspective ^a	0.21 (0.41)	.03	.48**	-.09	-.04	-.42**	.16**	-.08	-.10	-.03	.01	-.20**	-.50**			
15. you-references ^b	14. looking-for clauses ^a	0.50 (0.50)	.09	-.34**	-.01	-.03	.17**	-.03	-.08	.13*	-.33**	-.16**	.15*	.05	-.10		
	15. you-references ^b	1.35 (2.13)	-.02	-.16**	-.08	-.02	-.18**	-.10	-.08	-.06	-.13*	-.13*	-.12*	.23**	-.12*	-.07	
	16. question marks ^b	0.48 (1.38)	.01	-.01	.10	-.06	-.01	-.09	.03	-.04	-.08	.02	.01	.01	.00	-.001	.10

Note. ^a Features measured on a binary scale (0 = absence of the feature; 1 = presence of the feature). ^b Features presenting proportion (%) or percentage (°) scores: number of words in that category divided by total number of words in text (in the case of percentage scores multiplied by 100). * indicates $p < .05$ and ** $p < .01$.

Table 5.4 Summary of Hierarchical Regression Analysis for Text Features Predicting Perceived Profile Text Originality.

Category	Features	Model 1			Model 2			Model 3		
		B	SE B	β	B	SE B	β	B	SE B	β
Stylistic features	TF-IDF	0.21	0.04	.41***	-0.05	0.05	-.11	-0.08	0.05	-.16
	fixed metaphors ^a	0.36	0.10	.20***	0.18	0.09	.10*	0.19	0.09	.10*
	novel metaphors ^a	0.38	0.10	.20***	0.20	0.09	.10*	0.23	0.09	.12*
	low-frequent words ^b	1.36	0.43	.28**	-0.52	0.45	-.11*	-0.66	0.46	-.13
	adjectives ^b	0.43	0.52	.04	1.04	0.53	.10	0.89	0.54	.09
	adverbs ^b	1.92	0.99	.11	0.59	0.91	.03	0.64	0.91	.04
Self-disclosure features	number of words				0.01	0.00	.41***	0.01	0.00	.42***
	number of SDs				0.02	0.01	.15*	0.02	0.01	.19**
	concrete SD ^a				0.30	0.10	.17**	0.31	0.10	.17**
	article ^c				0.02	0.01	.13*	0.03	0.01	.16**
	I-references ^c				-0.01	0.01	-.06	.000	0.01	-.01
Perspective-taking features	no self-perspective ^a							0.29	0.13	.13*
	looking-for ^a							0.04	0.09	-.02
	you-references ^c							0.02	0.02	.06
	question marks ^c							0.02	0.03	.03
R^2			.215			.425			.438	
Adjusted R^2			.200			.403			.410	
ΔR^2			.215***			.209***			.014	

Note. ^aFeatures measured on a binary scale (0 = absence of the feature; 1 = presence of the feature). ^{b,c}Features presenting proportion (^b) or percentage (^c) scores: number of words in that category divided by total number of words in text (in the case of percentage scores multiplied by 100). SD refers to self-disclosure. * indicates $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

The goal of the content analysis was to gain insights into what profile text characteristics could foster positive perceptions of profile text originality. To do so, all texts were coded on a number of textual features that were determined based on an initial content analysis and could be predictors of perceived profile text originality. Each feature fit one of the three text feature categories we distinguished, that is, stylistic features, self-disclosure statements, or perspective-taking features. We then ran regression analyses to identify which features predict perceptions of text originality, as scored by the participants in the perception study.

Our results reveal that primarily the stylistic and self-disclosure features were correlated positively with perceived text originality scores and explained most of the variance in originality scores. With regard to stylistic features, our findings show that profiles that score higher on perceived profile text originality are more likely to contain one or more fixed or novel metaphors. Considering self-disclosure, we found that both features that looked at the quantity (i.e., total number of words and total number of self-disclosing statements) as well as quality of the self-disclosure (the occurrence of concrete self-disclosure and article use)⁶ predicted text originality scores. Although the

profile perspective was found to be a significant predictor of perceived text originality, the perspective-taking features did overall not contribute to the model.

General Discussion

As far as we are aware, this is the first study that has focused on perceived originality in online dating profiles. In the perception study, we first investigated the effects of perceived profile text originality on impression formation. This was done by presenting dating profiles to actual online dating site users which they evaluated on the profile's originality and the profile's owner personality and attractiveness. Next, we conducted a content analysis to explore what characteristics in a dating profile text increase perceptions of perceived profile text originality.

The results of the perception study showed that higher scores on perceived intelligence and sense of humor mediate the positive relationship between profile text originality scores and impressions of attractiveness and dating intention. This positive correlation of perceived originality, intelligence, sense of humor, and attractiveness accords with correlations found in previous studies (e.g., Gao et al., 2017; Kaufman et al., 2008; Miller, 2000). Contrary to the hypothesis, we found that higher originality scores lead to lower rather than higher oddness scores. In line with our expectation, profile owners scoring higher on perceived oddness scored lower on attractiveness and dating intention.

The content analysis provides insights into what characteristics in a profile text could increase perceptions of profile text originality. Our results reveal that primarily stylistic and self-disclosure features predicted higher text originality scores. It seems that profiles that were perceived as more original were more likely to contain fixed and novel metaphors (stylistic features) and more and concrete self-disclosure (self-disclosure features). Finally, profiles deemed original were less likely to be (fully) written from a self-perspective (perspective-taking feature).

Implications and Directions for Future Research

This study yields several implications for theory and future studies on (the effects of) originality. First, our study reveals that a general consensus exists among online daters about what profile texts are perceived original and not. In addition, the participants showed high agreement on the owners of which profiles were considered odd, and these profiles scored low on perceived originality. Consistent with the two-dimensional concept of creativity (Sternberg & Lubart, 1999), this finding suggests that online daters apply (without being instructed to do so) novelty and appropriateness criteria to assess a profile's originality; only profiles that are both novel *and* appropriate are considered original, profiles that are just novel are not. This raises the question where to draw the line between profiles that are novel but not appropriate, profiles that are appropriate but not novel,

and profiles that are both novel and appropriate. A future study could investigate this by asking participants to evaluate the perceived novelty and appropriateness of a large set of texts instead of the text's overall perceived originality.

Second, the results of the perception study show that online daters use profile originality as a cue to form impressions about profile owners. More specifically, it seems that the originality of a profile text primarily leads to positive impressions, both with regard to the profile owner's personality (higher scores on intelligence and sense of humor), and the profile owner's attractiveness and participants' dating intentions. This positive effect of originality on impression formation is further corroborated by the finding that originality did not lead to higher scores on perceptions of the less desired trait oddness. Originality may thus be seen as a positive property of a dating profile, which accords with previous interview studies in which online daters expressed negative attitudes towards dating profiles lacking originality (Masden & Edwards, 2015; Whitty, 2008). As the present study focused specifically on perceived originality in profile texts, and the effects of perceived profile text originality on impression formation, all profiles in this study included a blurred profile picture and varied only on the textual component. A follow-up study could investigate the extent to which different profile pictures are perceived as original, and how their perceived originality affects impressions of attractiveness.

Third, the results of the exploratory content analysis suggest that originality is a multifaceted construct in online dating: perceptions of text originality are affected by choices of form (stylistic features) as well as meaning (self-disclosure statements). This suggests that in addition to a multidimensional construct (i.e., novel and appropriate), originality is manifested through both meaning and form characteristics in dating profiles. Future research should examine how the criteria of novelty and appropriateness on the one hand, and meaning and form on the other hand, relate to each other. For example, stylistic features may be form characteristics that can boost a profile's novelty, while self-disclosure features may be meaning characteristics that are added to satisfy appropriateness criteria. The latter assumption builds upon an earlier study that suggested that online daters reveal personal information to conform with contextual expectations (Gibbs et al., 2011).

Our findings may well extend to other text genres, such as job application letters or consumer-to-consumer advertisements. There, text originality may also be a balancing act between novelty and appropriateness. Moreover, it is also likely that in these and other texts, perceived originality is not only defined by form, but also by certain meaning characteristics that are specific to the context. For example, a consumer-to-consumer advertisement should not only be original in form, but should perhaps also always contain specific product information in order to be perceived as original. Whether these assumptions hold in other contexts though, is up for future studies.

Fourth, this study has shown that it is possible to assess perceived text originality based on content analytical features, and our methodological approach offers opportunities for other research aiming to investigate what constitutes originality in texts and how perceived originality affects evaluations. With the features coded in this study, we were able to explain nearly half of the variation in perceived profile text originality scores, and particularly the manually-coded features were important for explaining variation in these scores. Most of these features were coded on the level of the text and not on word level as was the case for most automatically coded features, which may suggest that originality is more likely to occur on levels beyond the word level. A next challenge would be to examine whether automated measures of the manual-coded features of this study that seemed to indicate perceived text originality, could be developed using natural language processing (NLP) techniques, such as feature extraction and language modeling.

In all, the results of this study accord well with the recommendations of online dating sites to write original profile texts: the perceived originality of a dating profile text is indeed used as a cue for impression formation which has primarily positive effects. Owners of profiles that score high on perceived profile text originality tend to score higher on other positive dimensions, that is, intelligence, sense of humor, and attractiveness, as well as on participants' intentions to date the profile owner. Given our results, there seem to be (at least) two ways to increase perceptions of profile text originality: by disclosing more and concrete personal information, and by using stylistic features, such as (fixed and novel) metaphors. Altogether, our study highlights the importance of perceived originality in online dating profile texts, which can be manifested through both *what* information is provided and *how* this information is presented.

Footnotes

¹ We have run analyses with the assessments of the 50PlusMatch and Pepper participants separately, as well as with the results of all participants together. As similar results were found for all three analyses, the results reported are those with the participant group as a whole.

² In total, 775 participants (62.8%) viewed and assessed the maximum of five profiles. Seven participants who did not want to indicate their sexual preference, were presented with a total of ten profiles of which five were from men and five from women.

³ Results of the mediation analyses were similar when the number of words was included as a control variable.

⁴ While the use of we-references can also signal another perspective, this feature was not included in the codebook because it only occurred in a very limited number of profile texts ($n = 25$).

⁵ In this chapter, we provide the results of the hierarchical multiple regression with all 308 profiles included, but we have run a similar regression without the results of the 60 profiles that were used in the qualitative analysis phase to construct the codebook. The results of the regression with only the 248 profiles are comparable: adding stylistic features first accounted for 19.3% of the variance in originality, $F(6, 241) = 9.59, p < .001, R^2 = .193$, followed by the self-disclosure features that explained an additional 17.3%, $F(5, 236) = 12.89, p < .001, R^2 = .173$. Similar to the results with all profiles included, the perspective-taking features did not contribute significantly to the model, $F(4, 232) = 1.18, p = .321, R^2 = .013$.

⁶ It should be noted that while article use has previously been associated with language concreteness (Tausczik & Pennebaker, 2010), we found no correlation between article use and the occurrence of concrete self-disclosure in this study.

Appendix

CODEBOOK OF FEATURES				
Category	Feature	Definition	Measured	Examples
Stylistic features	Presence of fixed metaphors	The occurrence of a metaphorical expression in the profile text that is (a) a fixed word combination that is used metaphorically, or (b) a trope, meaning a metaphorical expression that is particularly common in the context of relationships and (online) dating.	Manual coding; Binary: absent (0) or present (1) in the text	"having a warm personality" (fixed word combination) "I'm a glass half full type" (fixed word combination) "building a relationship" (trope) "see whether there is chemistry" (trope)
	Presence of novel metaphors	The occurrence of a metaphorical expression in the profile text that appears novel and is not a fixed word combination that is used frequently or a trope that is often heard in a dating context.	Manual coding; Binary: absent (0) or present (1) in the text	"I have a nice balcony in my house" (0) "I entered the balcony acting like a real Florence Nightingale" (1) "I don't like people with beards" (0) "I don't like growers of crops situated between nose and neck" (1)
	Low-frequent words	Proportion of words in the text that belongs to the 20,000 most frequent Dutch words based on the SoNar corpus.	Automatic coding (T-Scan); Proportion scores (between 0 and 1); Number of 20,000 most frequent words used divided by total number of words	"I am a man from Amsterdam and searching for a nice woman" (all underlined words are part of the 20,000 most frequent Dutch words, 1,00 indicates the proportion score) "Apples, Archie Bunker, Bórek, Berlin, Blues" (0,33)
	Adjectives	Proportion of adjectives in the profile text.	Automatic coding (T-Scan); Proportion scores (between 0 and 1); Number of adjectives in the text divided by total number of words in the text	"This sporty and intelligent man searches a smart partner" (0.27 indicates proportion score) "50 years – cheeky – loving – masculine – wine – tapas" (0.43)
	Adverbs	Proportion of adverbs in the profile text.	Automatic coding (T-Scan); Proportion scores (between 0 and 1); Number of adverbs in the text divided by total number of words in the text	"rather positive than negative... rather Apple than Windows..." (0.25 indicates proportion score) "This highly disciplined and always cheerful woman recently signed up for this site" (0.23)

Category	Feature	Definition	Measured	Examples
Self-disclosure features	Number of words	Total number of words in a text.	Automatic coding (LWVC); Total number of words in a text	
	Number of self-disclosure statements	The amount of personal information a profile owner reveals about him/herself. This could also go in an indirect way (presenting personal information via an external source). This involves only information about the profile owner him- or herself and not the type of relationship (partner) the profile owner is looking for (see presence of looking-for clauses).	Manual coding; Total number of self-disclosure statements in the text	"I'm a <u>50-year-old man</u> " (all underlined words indicate one self-disclosure statement; i.e., 2 in this clause) "I'm a funny and sweet 50-year old man" (4) "Hobbies: volleyball, swimming, listening to music, dancing" (4)
	Self-disclosure intimacy	The extent to which the self-disclosure clause provides intimate information that is: (1) low intimate: biographical, demographic and descriptive information without evaluative aspect (name, age, height) (2) medium intimate: personal information with an evaluative aspect (personality, hobbies), or (3) high intimate: personal information that has a normative or moral value (norms and values, secrets, wishes).	Manual coding; Sum (1, 2, 3) score of the intimacy of the different clauses in the text	"I'm a man from Noord-Brabant" (low, scores 1) "My dog is called Door" (low) "I am a kind and fun person" (medium, scores 2) "In my weekends, I often go to the gym" (medium) "In my life, sharing is the keyword" (high, scores 3) "I am very proud of what I have achieved in my life" (high) "My life motto is: it's all in a mindset" (high)
	Presence of concrete self-disclosure	The occurrence of personal information that is specific and concrete as it evokes a clear imagery, for example by describing an assignable location, product, activity, period or moment. This could also involve information that specifies other information that is provided.	Manual coding; Binary: absent (0) or present (1) in the text	"Coffee and a cracker with cheese or jam are essential in my morning ritual" (evokes a clear image of the writer's breakfast) "I don't use a teabag twice" "I love going for a walk <u>at the coast</u> " (specification of walking) "I love cooking. <u>Home-made sushi is my specialty</u> " (specification of cooking)
	I-references	Percentage of I-references in the profile text, that is, references to the self (e.g., "I" and "me" in English). In Dutch: "ik", "ikzelf", "m'n", "me", "mezelve", "mij", "mijn", "mijne", "mijns", "mijzelf".	Automatic coding (LWVC); Proportion scores converted to percentage scores (between 0 and 100); Number of I-references in text divided by total number of words in the text	"I often go to the gym" (16.67 indicates percentage score) "Will you become <u>mine</u> ?" (25.00) "Online dating seemed a good idea to <u>me</u> , as I am a bit shy <u>myself</u> " (20.00)

Category	Feature	Definition	Measured	Examples
Perspective-taking features	Article use	Percentage of articles (i.e., "a", "an" or "the" in English) used in the profile text. In Dutch: "de", "het", and "een".	Automatic coding (LWC); Proportion scores converted to percentage scores (between 0 and 100); Number of articles in the text divided by total number of words in the text	"Love to go for <u>a</u> walk" "Love to go for <u>a</u> walk at <u>the</u> coast" "Love to go for <u>a</u> walk at <u>the</u> coast on <u>a</u> sunny day"
	Profile perspective	Whether the profile text is fully written from the writer's own point of view (the own eyes) or also (partially) from another perspective: (0) profile text that is fully written from the eyes of the profile owner ("I"), or: (1) profile text that is partially or fully written from another perspective than the profile writer's perspective. This could also be a 3 rd person perspective (the own 3 rd person "(s)he" or this (wo)man or from a poet, a narrator).	Manual coding; Binary: text with full self-perspective (0) or no full self-perspective (1)	"Hi, I am new to this site, I will adjust my text later" "I am a nice who would like to meet a friendly woman" "This nice man would like to meet a sweet woman." "Is there more chance of a date with a suitable text? Or has the date more chance of a suitable man? My agenda is ready" "Ingredients: 3 spontaneous spoons of olive oil • 1 big humorous onion, frittered • 300g creative winter carrot, grated..."
	Presence of looking-for clauses	The occurrence of clauses that refer to information provided by the profile owner about what kind of relationship (partner) is sought.	Manual coding; Binary: absent (0) or present (1) in the text	"My partner should be intelligent and humorous" "I prefer to start with a date, and see what happens next"
	Question marks	Percentage of question marks in the text.	Automatic coding (T-Scan); Proportion scores (between 0 and 1); Number of question marks in the text divided by total number of words in the text	"Hi all! This is me. Who are you." "Hi all! This is me. Who are you?" "Hi all, how are you? Are you ready to find love?"
	You-references	Percentage of you-references in the profile text, that is, references to the other person (e.g., "you", "your" in English). In Dutch: "ge", "gij", "gijzelf", "hullie", "hulliejen", "je", "jezelf", "jij", "jijzelf", "jou", "jouw", "jouwe", "jouwer", "jouwzelf", "jullie", "oe", "u", "uw", "uws", "uzelf".	Automatic coding (LWC); Proportion scores converted to percentage scores (between 0 and 100); Number of you-references in the text divided by total number of words in the text	"I am looking for you" "Your sense of humor should be good" "You and I should just meet and maybe I'll become yours"

6

General Discussion and Conclusion

The central aim of this dissertation was to investigate how language use in online dating profiles differs from one text to the next, how this affects impressions of profile owner attractiveness, and what processes underlie the relationship between language use and perceived attractiveness. To achieve this goal, we focused on three central questions that were posed in the general introduction of the dissertation. These three questions tied in with three stages of dating profile evaluation that are presented in Figure 6.1: the profile construction stage, the profile cue processing stage, and the impression formation stage.

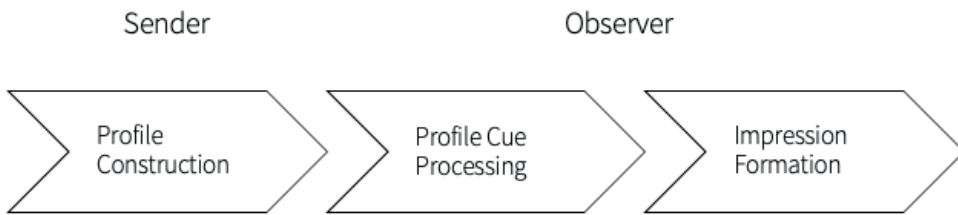


Figure 6.1 Three stages of dating profile evaluation.

This thesis combined experimental studies collecting eye tracking and impression formation data with studies using different text analysis methods coding texts on both automated and manually coded features. Actual online dating site users participated in our studies and profile texts derived from online dating sites were used as study materials. Since the studies are described in detail in each of the individual chapters, this chapter presents an overview of the results of the four chapters, and provides brief answers to the three central research questions. Then, we discuss the general theoretical implications, going through the stages of the dating profile evaluation process, followed by directions for future research. Finally, we provide practical implications for online dating and end with a general conclusion.

Overview of the Studies

Chapter 2: Effects of Relationship Goal on Linguistic Behavior in Profile Texts

The goal of the study in Chapter 2 was to examine (a) to what extent dating intentions affect linguistic behavior in online dating profile texts, and (b) which particular linguistic cues are important when trying to distinguish between profile texts written by long-term and casual relationship seekers. This was investigated by analyzing a large sample of authentic profile texts ($N = 12,310$) with two computer-based text analysis methods, the Linguistic Inquiry and Word Count program (LIWC; Pennebaker et al., 2015) and a word-based classifier. Results of both methods suggest that profile

texts differ depending on the type of relationship writers pursue, both in terms of linguistic cues that seem to be strategically chosen and unconsciously leaked cues. More specifically, long-term relationship seekers were found to use more positive emotion words and more often presented personality traits particularly relevant when looking for a long-term relationship, for example through the use of words such as “trustworthy” and “careful”. They were also more inclined to use more words and to refer to the self by using words as “I”, “me” or “my”. Compared to texts of long-term relationship seekers, those of casual relationship seekers were less consistent, in that it was more difficult to identify linguistic cues indicative of this group of texts. In general, these patterns suggest that relationship goals can leave linguistic traces in textual self-presentations on dating profiles.

Chapter 3: Effects of Different Language Error Types and Picture Visibility on Impression Formation

Chapter 3 reported on two experimental studies regarding the effects of language errors on impressions of profile owners formed by actual online dating site users ($N = 738$). The goal of the first study was to investigate (a) to what extent language errors in dating profiles affect perceptions of profile owners’ attractiveness, and (b) whether this effect was stronger when no profile picture information was available (blurred profile picture) than when the profile included a visible picture (depicting a moderately attractive person). While language errors were not found to affect perceptions of profile owners’ physical attractiveness and dating intentions, owners of profiles with language errors were perceived as less socially and romantically attractive than owners of profiles without errors, specifically by the participants who indicated to have noticed the errors. This negative effect of language errors was not strengthened in the absence of profile picture information. Similar to the effects of language errors, picture visibility also had differential effects on the three attractiveness dimensions: a visible picture positively affected perceptions of physical attractiveness, but did not affect perceived social-romantic attractiveness, nor dating intentions.

The second study investigated more closely why language errors affect perceptions of attractiveness. To do so, we distinguished three language error types that were all expected to affect impressions of different personality characteristics, hence mediating attractiveness impressions. As predicted, mechanical (e.g., “the” instead of “the”) and rule-based language errors (e.g., “intelligent” instead of “intelligent”) negatively affected dating intentions and perceived attractiveness – on both dimensions – through lower attentiveness and intelligence perceptions, respectively. In contrast with our expectations, profile owners using informal language (e.g., “:-D” and “hello!!!!”) were not perceived as warmer, but higher warmth scores did result into higher attractiveness scores. This generally suggests that different language error types affect impression formation negatively as a result of particular personality impressions attributed to these error types.

Chapter 4: Effects of Picture Attractiveness and Language Errors on Information Processing and Impression Formation

The aim of the study in the fourth chapter was to test our developed picture gatekeeper model, which proposed that people are more attentive to cues in profile texts, and rely more heavily on these cues, when profile picture information is ambiguous and not (yet) sufficient to form an initial impression. We investigated this by collecting both eye tracking and impression formation data, and by manipulating profile pictures in such a way that picture information was either ambiguous (i.e., moderately attractive picture) or unambiguous (i.e., attractive or unattractive picture). Profile texts again contained language errors or not. Only some support was found for our proposed picture gatekeeper model. The eye tracking data showed that profile pictures were more likely to attract initial attention than texts, which supports the model, but also demonstrated that a picture's attractiveness did not affect the attention devoted to texts, which contrasts with the model's expectations. Our impression formation data partially supported the picture gatekeeper model. The expected interaction effect of picture and text attractiveness was only found for perceived physical attractiveness, suggesting that when picture information is ambiguous, people put more weight on the language errors in a profile when evaluating this person's physical attractiveness. However, this interaction effect was not obtained for perceived social and romantic attractiveness, indicating that picture ambiguity did not make people rely more heavily on language errors when forming impressions on these dimensions.

Similar to the results of the first study of Chapter 3, our impression formation data showed different results for the picture and text manipulations on perceptions of the three attractiveness dimensions. This was not only found regarding the interaction effects described above, but also with regard to the main effects of picture attractiveness and language errors on perceived physical, social, and romantic attractiveness. That is, more attractive pictures positively affected perceptions of physical attractiveness, and to a lesser extent social and romantic attractiveness, while language errors negatively affected scores on profile owners' perceived social and romantic attractiveness, but not their physical attractiveness.

Chapter 5: Effects of Perceived Profile Text Originality on Impression Formation

The study presented in Chapter 5 investigated perceived profile text originality, and consisted of both a perception study and a content analysis. The goal of the perception study was to examine (a) whether perceived profile text originality affects attractiveness and personality impressions, and (b) to what extent specific personality impressions explain impressions of attractiveness. Results showed that perceptions of actual online dating site members ($N = 1234$) about a text's originality positively affected perceived physical, social, and romantic attractiveness, as well as perceptions of dating

interest. Increased perceptions of profile owners' intelligence and sense of humor (i.e., desired partner personality traits) were found to account for this effect, while perceived oddness (i.e., less desired trait) did not. Thus, perceived profile text originality seems to have primarily positive effects on impression formation.

The second goal of this study was to examine by means of an exploratory content analysis what specific cues in profile texts enhance perceptions of their originality. Results revealed that perceived originality is a multifaceted construct in online dating profiles, which can be manifested through different linguistic cues: profile texts deemed more original tended to include more words, more self-disclosure, and more concrete self-disclosure, and were more likely to contain one or more fixed and/or novel metaphors. This suggests that both cues related to *what* is written in a profile text (i.e., more (concrete) self-disclosure), and *how* a text is written (i.e., use of metaphors) enhance a text's perceived originality, and consequently impressions of profile owners' personality and attractiveness.

Answers to Central Research Questions

Q1: Does Language Use in Dating Profile Texts Reveal Information About Profile Owners?

The first central question that was raised in this dissertation tied in with the profile construction stage of the proposed dating profile evaluation model, and asked *whether* and if so *how* language use in dating profile texts reveals information about profile owners. In this dissertation, this question has been examined in two different studies, for which different text analysis methods have been used. First, we found that profile owners' intended relationship goals are reflected in texts (Chapter 2), in such a way that long-term relationship seekers more often mentioned personality traits and qualities particularly relevant to find in a long-term relationship partner (e.g., trustworthy, careful). They also seemed to disclose more personal information by using more words and referring more often to the self. Second, results of the exploratory content analysis in Chapter 5 revealed that more (concrete) self-disclosure and metaphor use are linguistic indicators of perceived text originality. These two studies have shown that dating profile texts can be linguistically different depending on (dynamic) characteristics of writers (i.e., writer's dating intentions) and perceived text characteristics (i.e., a text's perceived originality), and uncovered specific linguistic cues that may reveal these characteristics.

Q2: To What Extent Do Cues in Profile Texts and Pictures Affect Impression Formation?

The second central question was related to the profile cue processing stage, and specifically concerned the extent to which people rely on cues in both profile texts and pictures to form impressions of profile owners' attractiveness, and how the effects of cues in texts compare against

those in pictures. Two chapters in this thesis investigated the effects of textual and pictorial cues – and their potential interplay – on perceived attractiveness (Chapter 3, Study 1; Chapter 4), and processing of the two components (Chapter 4). Two main conclusions may be drawn based on our findings. First, both pictures and texts in dating profiles provide cues for the evaluation of a profile owner’s attractiveness, but the impact is stronger for pictorial than for textual cues. Second, effects of textual cues seem to be (fairly) robust, as they are hardly affected by those of pictorial cues. That is, almost no interaction effects between picture and text manipulations were found on either the attractiveness impressions formed (Chapter 3, Study 1; Chapter 4) and the processing of the component in the other modality (Chapter 4). The one exception is the interaction effect we observed in Chapter 4 that suggests that when picture information is not (yet) sufficient to form an impression about a profile owner’s physical attractiveness – which is the case with ambiguous pictures depicting moderately attractive persons – textual cues weigh more, potentially to form an impression about this person’s physical attractiveness anyway. Thus, our data suggest that cues from profile pictures carry most weight for impression formation, but (the presence of) picture information does not weaken effects of textual cues for impression formation, nor does it affect attention to profile texts.

Q3: How Do Linguistic Cues Affect Impression Formation?

The third and final central question we tackled in this dissertation, which was related to the impression formation stage, focused on the processes that underlie the effects of linguistic cues on impressions of profile owner attractiveness. To answer this question, we investigated the effects of linguistic cues on personality impressions in addition to attractiveness impressions. In this dissertation, we focused specifically on language errors (Chapters 3 and 4) and perceived text originality (Chapter 5), and found both provide cues for evaluating a profile owner’s attractiveness, in such a way that effects of language errors were generally negative, and those of perceived originality positive. As expected, our studies showed that (different) language error types (Chapter 3; Study 2) and perceived profile text originality (Chapter 5) led to specific personality impressions, which, in turn, affected profile owners’ perceived attractiveness and dating potential. Personality impressions that are generally considered desirable in a potential romantic partner positively mediated effects on perceived attractiveness (i.e., intelligence, humor), while the reversed happened when a cue indicated the lack of a desired trait (i.e., lack of intelligence or attentiveness). This suggests that people infer specific personality impressions from (different types of) linguistic cues, as we found with regard to impressions about a profile owner’s intelligence. In turn, these personality perceptions could either boost or temper perceptions of attractiveness. In addition, we found that cues in profile texts primarily impacted perceptions of social and romantic attractiveness, and not physical attractiveness.

Theoretical Implications

This dissertation has several important overarching theoretical implications, which we present below, looking at the three stages of dating profile evaluation that we defined in the introduction to this thesis: profile construction, profile cue processing, and impression formation.

Profile Construction

This dissertation provides new insights into the process of dating profile construction, and specifically into how language use in online dating profile texts can be affected by writer and text characteristics. With regard to writer characteristics, we have shown that writers' relationship goals can be derived (to some extent) from specific cues in a text. This adds to the current literature on language use in dating profiles that mainly investigated how stable and demographic writer characteristics are reflected in texts (e.g., Davis & Fingerman, 2016; Groom & Pennebaker, 2005). We showed that goals of writers, which are more dynamic and non-demographic characteristics of these writers, also influence online daters' linguistic behavior. This was found both for cues that may be produced consciously to reflect certain characteristics of the profile owner (e.g., personality traits) and for cues that profile owners may give off less consciously (e.g., personal pronouns). Regarding text characteristics, the content analysis of Chapter 5 revealed that linguistic cues that are indicative of a text's perceived originality are cues both concerned with *what* information is presented and *how* this information is provided. These different linguistic markers, in turn, can be processed by others, and be used for impression formation. In fact, in another study not part of this dissertation we found indeed that people can rely on cues in profile texts to determine a profile writer's preferred relationship goal (Van der Lee et al., 2019), and results of Chapter 5 showed that perceptions of a text's originality lead to personality and attractiveness impressions of profile owners.

Furthermore, our studies show the value of using different text analytical tools, and looked at a variety of linguistic cues when trying to obtain a finer-grained and more comprehensive picture of language use in dating profile texts. In this dissertation, profile texts were subject to both automated (i.e., LIWC, T-Scan, word-based classifier) and manual analyses. Decisions about which method to use were based on the purpose of the analyses and the cue(s) of interest, taking into consideration that some cues can be captured more reliably with automated analyses relying on word-based approaches than others. Our studies showed that specific words in a text can already indicate writers' relationship goals, whereas text originality is more likely to occur on levels beyond the word level. This thesis demonstrates the advantage of combining automated and manually coded features in one analysis (e.g., to indicate a text's perceived originality), as well as the benefit of combining

different computer-based methods to analyze online dating profile texts (e.g., LIWC with a word-based classifier).

Profile Cue Processing

Our data demonstrate that people pay attention to both textual and pictorial cues in multimodal dating profiles. The eye tracking patterns reported on in Chapter 4 showed that a profile's picture is most likely to receive initial attention, and that the amount of attention devoted to profile pictures and texts varies, with people looking longer at attractive than less attractive pictures and longer at profile texts with than without language errors. Those cues that are processed from the profile may consequently be used as indicators to determine the profile owner's attractiveness, which became particularly apparent in the results of Chapter 3 that revealed that only participants who indicated to have noticed language errors were negatively affected by them.

Our findings seem to indicate that processing pictures and texts in multimodal dating profiles happens regardless of *what* specific information is available in the other modality. Thus, the attractiveness of a picture does not seem to function as a gatekeeper that "blocks" further consideration of the profile text, nor does the text and its attractiveness "block" attention to the picture. This suggests that picture and text processing in multimodal profiles are two relatively independent processes, that happen consecutively. This is supported by the little switches between picture and text focus that we observed in the eye tracking data, which seems to indicate that individuals attend to one of the components first (in most cases the picture), followed by processing the other component.

Impression Formation

The studies in this thesis highlight the importance of language use as a cue for impression formation, in particular impressions of the personality, attractiveness, and dating potential of profile owners. This contribution to theory formation on computer-mediated communication and online impression formation consists of the integration of research on (text) stylistics and author profiling (e.g., Pennebaker et al., 2003; Rangel & Rosso, 2013, 2016) with studies on online impression formation (e.g., Walther et al., 2009; Wotipka & High, 2016). Most earlier research on stylistics investigated linguistic differences in texts, often reflecting writer characteristics, but paid little attention to how others pick up on this (social) information to form impressions of writers. Computer-mediated communication research, on the other hand, investigated effects of different types of cues in online profiles on impression formation, but those of linguistic cues remained relatively understudied. Prior to this dissertation, online dating studies using qualitative approaches such as interviews suggested that online daters evaluate profile owners based on language use (e.g., word choice, writing ability,

text length; Ellison et al., 2006; Sharabi & Dykstra-DeVette, 2019), but hardly any studies empirically investigated effects of language use on impression formation. This dissertation showed that linguistic traces that profile owners leave in their texts are indeed used by others to form impressions.

Our results show that linguistic cues affect impressions in various ways. First, perceptions of attractiveness can be affected positively or negatively, depending on the specific linguistic cues (language errors and perceived text originality in this thesis). Second, personality perceptions inferred from language use can explain the positive or negative effects on perceived attractiveness. That is, people seem to relate specific linguistic cues to certain personality characteristics, and these personality impressions, in turn, enhance or lessen perceptions of attractiveness and dating interest. The appeal of this personality trait in a romantic partner determines the direction of the attractiveness impressions formed: linguistic cues associated with desirable personality traits (e.g., intelligence, humor) result in increased levels of perceived attractiveness, while the reverse applies for linguistic cues signaling an undesired partner trait or the lack of a desired trait (e.g., lack of intelligence or attentiveness). Our close examination of specific linguistic cues and their effects on different impressions extends previous research that showed effects of profile cues on one specific aspect of a profile owner, often either a personality impression (e.g., Van der Heide et al., 2012; Walther et al., 2009) or a favorability or attractiveness impression (D'Angelo & Van der Heide, 2016; Utz, 2010; Wang et al., 2009). We extended this by looking more closely at the relationship between specific (linguistic) cues and attractiveness impressions through perceptions of specific personality traits.

Moreover, this thesis provides a new outlook on the multidimensional character of attractiveness, in particular when assessing effects of pictorial and textual cues on perceived attractiveness. Our studies indicated that effects of textual cues persist and are not overridden by effects of pictorial cues: language errors affected perceptions of attractiveness irrespective of the picture's visibility (Chapter 3, Study 1) or the looks of the depicted person (Chapter 4). This can be explained by the specific attractiveness dimensions that people seem to relate to the two profile components: to draw inferences about social attractiveness participants were found to rely most heavily on cues in texts, whereas pictorial cues mostly impacted perceptions of physical attractiveness, and to a lesser extent social attractiveness. It thus seems that impressions on one dimension of attractiveness do not simply spill over into impressions on other dimensions. Research on (online) impression formation generally assumes that people rely on heuristics or mental shortcuts when forming impressions, leading to the development of one overall impression instead of separate impressions (Kahneman, 2011; McCroskey & McCain, 1974; Willis & Todorov, 2006). Our studies suggest that this may not (always) be the case.

Directions for Future Research

The overall findings of this thesis suggest that online daters construct (multimodal) dating profiles – varying depending on their characteristics – that provide profile cues others can process, and hence use to form impressions about the profile owners. This three-stage dating profile evaluation model evolved into a conceptual framework, which is a broader conceptualization of the Multimodal Information Processing (MIP) model presented in Chapter 4 (Figure 4.5), and that offers many opportunities for future research on the stages of profile construction, profile cue processing, and impression formation.

First, with regard to dating profile construction, future research could study the different stages (new) members of dating platforms go through when creating their profile texts. This could be done by monitoring daters' writing process, for instance through the collection of keystroke logging data, in particular when collected in combination with think-aloud protocols in which writers have to verbalize why they decide to write, alter, or delete particular parts of their texts. Moreover, new studies could examine to what extent people are aware of, and act upon, the personality inferences they may leave behind in their texts, and how these expected inferences correspond with perceptions of profile observers.

Second, with regard to profile cue processing, further research could investigate interaction effects between different profile cues that are processed *within* one profile component. For example, people may pay more attention to picture background cues when pictures are ambiguous in terms of physical attractiveness (i.e., moderately attractive) than when picture information is unambiguous (i.e., either attractive or unattractive). Additionally, it would be interesting to see whether picture attractiveness serves as a “filter”, in such a way that it biases how a profile text or other profile information – that most likely receives attention after the picture – is assessed. In this case, other profile information may be evaluated more positively if a person's picture is attractive, while the reverse may hold for profiles with unattractive pictures.

Third, with regard to impression formation, future research could examine potential cross-over effects of pictorial and textual cues on impressions of physical and social attractiveness by investigating the extent to which people also use pictorial cues to form impressions of social attractiveness and textual cues for impressions of physical attractiveness, and what specific features they use to do so. In addition, the distinction that seems to exist between linguistic cues and perceptions of social attractiveness on the one hand, and pictorial cues and physical attractiveness perceptions on the other hand, invites to further investigate whether and how these different attractiveness impressions integrate. The effects we obtained in our studies of language errors on impressions of social attractiveness and those of picture visibility and attractiveness on perceived

physical attractiveness may have been combined when evaluating a profile owner's romantic attractiveness. It should be experimentally tested whether impressions of physical and social attractiveness mediate ultimate impressions of romantic interest, and whether one dimension is more prevailing than the other depending on the different pictorial and textual cues present on the profile.

Practical Implications for Online Dating

Results of this dissertation also yield practical implications, in particular for users and owners of online dating platforms. Four general recommendations can be provided to online daters, specifically users of platforms with profiles containing a textual component. First, while constructing their profiles daters are recommended to always put time and effort in both the picture *and* the text, as both components receive attention and the attractiveness of one component does not compensate for another less attractive component. Second, it is advised to pay attention to *what* information is provided in a text, as well as to *how* this information is provided, since others may pick up on both types of cues when forming impressions. Third, all types of language errors should generally be avoided as this may negatively affect attractiveness perceptions because of associations with lack of intelligence and inattentiveness. By the same token, improving the originality of a text may be a way to appear more intelligent and funny, and hence more attractive. This can again be done via a text's content, by disclosing more and concrete personal information, and in the language that is used to provide this content, for example, by including metaphors. Finally, it is recommended to carefully attend to different types of cues when reading and assessing profiles of others, as also more implicit cues can give away relevant information, such as regarding another person's intended relationship goals (e.g., casual vs. long-term), and ask whether those match your own goals.

Additionally, two practical implications for online dating platforms may be drawn from our results. First, platforms that want their users to make choices about romantic interest based on more complete impressions are recommended to let members create a profile consisting of multiple components. The profile text can be particularly important because daters have to invest time and effort to personalize them, and inferences about their writers' social attractiveness and personality are likely to be drawn from the information provided in it. Second, owners of dating platforms should be aware that the way in which components appear on a profile may affect how they are processed, and hence assessed. Our finding that a picture especially attracts initial attention when it appears on the profile left's side can indicate that other profile component compositions affect, to some extent, what component captures first attention. This may be particularly relevant for platforms that want to

place less emphasis picture attractiveness, and more on texts, such as platforms specifically aiming to match long-term relationship seekers.

General Conclusion

The central aim of this dissertation was to investigate how language use in online dating profiles differs from one text to the next, how this affects impressions of profile owner attractiveness, and what processes underlie the relationship between language use and perceived attractiveness. Based on the results of the four studies presented in this thesis, in which an interdisciplinary and multi-method approach has been taken, four main conclusions can be drawn. First, profile texts seem to be linguistically different dependent on (dynamic) characteristics of writers and texts. Second, pictorial cues on multimodal dating profiles have most impact on impression formation but effects of cues in texts are robust. Third, pictorial and textual cues affect different dimensions of attractiveness differently, with pictures most heavily affecting perceived physical attractiveness, and texts perceived social attractiveness. Finally, different linguistic cues affect attractiveness impressions via specific personality impressions attributed to these cues. Findings of this thesis offer novel insights into three stages of dating profile evaluation (profile construction, profile cue processing, impression formation), and have both theoretical as well as practical implications, explaining why including metaphors about Hagrid or language errors in a profile text may or may not get you a date.

Summary

This dissertation aimed to examine how language use in online dating profiles differs from one text to the next, how this affects impressions of profile owner attractiveness, and what processes underlie the relationship between language use and perceived attractiveness. To obtain insights into linguistic cues in dating profile texts and their effects on impression formation, this thesis focused on three stages of dating profile evaluation: 1) the profile construction stage, in which users create a dating profile (text) to present themselves, 2) the profile cue processing stage, in which profile observers view profiles of others and process the cues on these profiles, and 3) the impression formation stage, in which impressions about owners of profiles are formed based on the cues that are processed from a profile. Each of these stages comes with questions, and this dissertation attempted to answer three central research questions that were specifically related to one of them.

To achieve the goals of this thesis and to answer the three central research questions, we did four empirical studies taking an interdisciplinary and multi-method approach (e.g., experimental studies, eye tracking, and (automated) text analysis). In addition, actual online dating site users have participated in our experimental studies and authentic profile texts derived from dating platforms have been used as materials for our studies. In doing so, we tried to better understand whether, how, why, and under which circumstances linguistic cues in online dating profiles affect impressions of attractiveness.

Overview of the Studies

Study 1

The first study (in Chapter 2) focused on the profile construction stage and examined to what extent dating intentions affect linguistic behavior in online dating profile texts, and in what way these texts of long-term and casual relationship seekers are linguistically different. Two computer-based text analysis methods, the theory-driven LIWC program and a data-driven word-based classifier, were used to analyze a sample of 12,310 authentic profile texts. Results of both methods suggest that dating profile owners differ in how they linguistically present themselves in their texts dependent on the type of relationship pursued, with these linguistic patterns being more distinct for long-term than casual relationship seekers. More specifically, long-term relationship seekers seemed more inclined to use positive emotion words that are particularly relevant when looking for a long-term relationship, such as internal personality traits and qualities (e.g., “trustworthy”, “honest”, “serious”). Furthermore, texts of long-term relationship seekers were longer and seemed to include more references to the self, which may be an indication of higher levels of self-disclosure. The findings of this study suggest that during the profile writing process, profile writers’ long-term relationship goal can affect linguistic behavior both unconsciously, by using more automatically produced I-

references, and consciously, by strategically mentioning personal attributes that are deemed important in a long-term relationship partner.

Study 2

The second study (Chapter 3) investigated the impact of language errors in online dating profiles on impression formation by means of two experimental studies. In the first part of this research, we examined whether language errors in profile texts negatively affect perceptions of profile owner attractiveness and intentions to date the profile owner. We also investigated whether this negative effect of language errors on impressions of attractiveness and dating intentions was stronger when no other information, in the form of a visible profile picture, was available and impressions could thus only be based on those cues in the text. The participants in these studies, real users of online dating sites, showed that the effects of language errors and profile picture visibility were not the same for all aspects of impression formation: we found that language errors negatively affect social-romantic attractiveness, but not physical attractiveness and dating intentions. This negative effect was particularly strong for participants who indicated to have noticed language errors in the profiles. Picture visibility did, on the other hand, not affect social-romantic attractiveness and dating intentions, but did affect physical attractiveness, with profile owners with visible pictures being perceived as more physically attractive than those with blurred pictures. No interaction effects of language errors and picture visibility were found, indicating that participants did not rely more heavily on language errors when profile picture information was absent (i.e., blurred picture).

The second part of this research focused on the underlying processes that could explain the relationship between language errors and impressions of attractiveness and dating intentions. To do so, four types of profile texts were constructed: texts with mechanical language errors (e.g., “teh” for “the”), texts with rule-based errors (e.g., “intrested” for “interested”), texts with informal errors (e.g., “:-D”, “hello!!!!”), and texts without errors. Each of these three error types were expected to be associated with different personality traits: mechanical errors with attentiveness, rule-based errors with intelligence, and informal errors with warmth. In line with the expectations, results revealed that mechanical and rule-based errors resulted, respectively, in lower attentiveness and intelligence perceptions which in turn negatively affected perceived attractiveness and dating intentions. Overall, our findings suggest that language errors serve as an important cue for impression formation, affecting impressions of profile owners’ personality, attractiveness, and dating intention.

Study 3

The third study (Chapter 4) examined how online dating profiles, consisting of both pictures and texts, are visually processed, and how cues in both components affect impression formation. To investigate

this, we collected both eye tracking and perception data: participants viewed different profiles containing pictures and texts. These profiles varied systematically on picture attractiveness (i.e., attractive, moderately attractive, and unattractive pictures) and profile texts either included language errors or not. After viewing a profile, participants evaluated the profile owners on their physical, social, and romantic attractiveness. Eye tracking results revealed that profile pictures were more likely to attract initial attention, that more attractive pictures received more attention, and that texts received attention regardless of the picture's attractiveness. Perception data showed that pictorial and textual cues affected impression formation, but that they affected different dimensions of perceived attractiveness differently: more attractive picture resulted in higher scores on perceived physical, social, and romantic attractiveness, while language errors negatively affected social and romantic attractiveness, but not physical attractiveness. Furthermore, the expected interaction effect of picture attractiveness and language errors was only found for perceived physical attractiveness, indicating that language errors negatively impact physical attractiveness when a profile includes a moderately attractive picture but not when it contains an attractive or unattractive picture.

Based on our results, we proposed the multimodal information processing (MIP) model, which discerns three stages: the processing stage in which people process the profile picture and text independently (with the picture more often processed first), the cue assessment stage, in which people separately assess the different pictorial and textual cues available on the multimodal profile, and the impression formation stage, in which people use the (cues on the) profile picture and text to form impressions on separate aspects of attractiveness.

Study 4

The fourth study (Chapter 5) focused on perceived originality in online dating profile texts, and consisted of two parts: a perception study and a content analysis. The perception study examined the relation between perceived originality of dating profile texts, perceptions of (less) desired personality traits in a potential partner, and perceptions of attractiveness and dating intentions. To do so, online dating site users were presented with one or more authentic profile texts (all accompanied by a blurred picture) and evaluated the profile's originality, the profile owner's physical, social, and romantic attractiveness, and their intention to date the profile owner. In addition, they assessed each profile owner on three personality characteristics that are often associated with (text) originality: intelligence, sense of humor, and oddness. Results showed that perceived profile text originality affects impression formation, and primarily in a positive way: owners of profiles that scored high on perceived text originality were evaluated as more intelligent and funny which, in turn, led to higher attractiveness and dating intention scores. Perceived oddness did not mediate the effect of profile text originality on attractiveness impressions.

The goal of the content analysis that followed was to gain insights into what specific characteristics in authentic profile texts foster positive perceptions of profile text originality. To do so, all profile texts from the perception study were (manually and automatically) coded on 15 text characteristics that were identified on the basis of an initial (qualitative) content analysis. Each characteristic was either concerned with the text's style (e.g., metaphors), the personal information disclosed in a text (e.g., concreteness of self-disclosed information), or the profile's focus on the self- and/or other (e.g., you-references). Results of a hierarchical multiple regression revealed that primarily the stylistic and self-disclosure features explained variance in perceived text originality scores. More specifically, profiles were more likely to score higher on perceived text originality when they contained metaphors, more and concrete self-disclosure statements, and when they were not (fully) written from a self-perspective. Taken together, these findings suggest that perceived originality in profile texts is a multifaceted construct that can be manifested both in meaning, through the use of self-disclosure, and in form, through the use of metaphors.

Answers to Central Research Questions

The first central research question asked *whether* and *how* language use in dating profile texts reveals information about profile owners. We have shown that profile texts can indeed be linguistically different depending on writers' dating intentions and (perceived) text originality. Through the use of automatic and manual text analyses, we have also illustrated the ways in which language use in profile texts can differ: long-term relationship seekers seem to disclose more personal information and mention more internal personality traits, and texts deemed more and less original can differ in the occurrence of metaphors and (concrete) self-disclosure.

The second central research question was concerned with the extent to which people rely on cues in both profile texts and pictures when forming an impression of profile owners' attractiveness, and how the effects of cues in texts compare against those in pictures. This dissertation has shown that people use cues in both components to evaluate a profile owner's attractiveness, but that the effects of pictorial cues are stronger than those of texts. Nevertheless, the effects of textual cues seem to be fairly robust and picture information does not seem to weaken the effects of texts on impression formation.

The third central research question focused on the processes that underlie the effects of linguistic cues on impressions of profile owner attractiveness. The findings of this thesis reveal that people infer specific personality impressions from linguistic cues in profile texts (e.g., (lack of) intelligence, attentiveness, sense of humor) and that the appeal of these personality traits in a potential romantic partner, in turn, determines the perceived attractiveness of the profile owner.

Furthermore, our findings show that cues in profile texts primarily affect perceptions of social and romantic attractiveness, and not physical attractiveness.

Implications

The findings of this dissertation have several implications for theory, and tie in with the three stages of dating profile evaluation. First, on the level of profile construction, this thesis provides new insights into the ways in which language use in online dating profiles can differ depending on characteristics of writers and texts. Moreover, this thesis highlights the value of examining different types of (automatically and manually coded) text features and using different analytical tools when attempting to get a better view on language use in profile texts.

Second, on the level of profile cue processing, we found that people pay attention to both textual and pictorial cues in multimodal dating profiles. People are then likely to use the cues that they process as indicators to assess a profile owner's attractiveness. Furthermore, this processing of pictures and texts in multimodal dating profiles seem to be happen regardless of *what* specific information is available in the other modality, suggesting that picture and text processing are two relatively independent processes, that happen consecutively.

Third, on the level of impression formation, our studies highlight the importance of language use as a cue for impression formation, particularly for impressions of a profile owner's personality, attractiveness, and dating potential. Moreover, we have shown that associations between specific linguistic cues and (desired or undesired) partner personality traits can explain the positive and/or negative effects on perceived attractiveness. Finally, this thesis provides a new outlook on the multidimensional character of attractiveness. Our studies suggest that people relate different profile components to specific attractiveness dimensions: (cues in) texts to impressions of social attractiveness, and (cues in) pictures to impressions of physical – and to a lesser extent social – attractiveness.

Finally, this dissertation also yields practical implications for online daters and owners of dating platforms. Online daters are recommended to always put time and effort in both the picture *and* the text, and to pay attention to *what* and *how* information is presented in a text. Furthermore, all types of language errors should in general be avoided, while creating an original text is recommended. Dating platforms owners are advised to let members create a profile consisting of multiple profile components. Finally, they should be aware that the way in which components appear on a profile may affect how they are processed, and hence assessed. In all, this thesis provides new insights that are of both theoretical and practical relevance.

Samenvatting

In deze dissertatie is onderzocht hoe het taalgebruik in onlinedatingprofielen van elkaar verschilt, hoe dit indrukken over de aantrekkelijkheid van de profieleigenaar beïnvloedt, en welke onderliggende processen de relatie tussen taalgebruik en waargenomen aantrekkelijkheid kunnen verklaren. Om inzicht te krijgen in de talige cues in profielteksten en hun effecten op indrukvorming lag de focus op drie fases van datingprofiel-evaluatie: 1) de fase van profielconstructie waarin gebruikers een profiel (tekst) creëren om zichzelf te presenteren, 2) de fase van profielverwerking waarin observeerders profielen van anderen bekijken en de cues hierop verwerken, en 3) de impressievormingsfase waarin observeerders indrukken over profieleigenaren vormen op basis van de verwerkte cues. In dit proefschrift probeerden wij drie centrale onderzoeksvragen te beantwoorden die elk aansluit bij een van deze drie fases.

Om de doelen van dit proefschrift te bereiken en de drie centrale onderzoeksvragen te beantwoorden hebben wij vier empirische studies uitgevoerd. Wij hebben voor een multidisciplinaire aanpak gekozen en gebruikten verschillende methoden (bijv. experimentele studies, tekstanalyses). Daarnaast hebben gebruikers van datingsites deelgenomen aan de experimentele studies en zijn authentieke profielteksten, afkomstig van echte datingsites, gebruikt als materialen voor onze studies. Wij hoopten zo beter te kunnen begrijpen wanneer, hoe, waarom, en onder welke omstandigheden talige cues in datingprofielteksten indrukken van aantrekkelijkheid beïnvloeden.

Overzicht van de Studies

Studie 1

De eerste studie (in hoofdstuk 2) onderzocht in welke mate datingintenties talig gedrag in datingprofielteksten beïnvloeden, en op welke manier profielteksten van gebruikers die een langetermijnrelatie zoeken talig verschillen van die van gebruikers die iets meer vrijblijvends zoeken. Twee automatische tekstanalysemethoden werden gebruikt om ruim 12,000 authentieke profielteksten te analyseren: LIWC, dat vooral geschikt is voor hypothesetoetsende analyses, en een *word-based classifier*, die meer vanuit de data patronen zichtbaar maakt. Beide methoden lieten zien dat de zelfpresentaties in profielteksten verschillen afhankelijk van het soort relatie dat datingprofiel-eigenaren zoeken. Deze linguïstische patronen bleken met name onderscheidend in de teksten van de mensen die een langetermijnrelatie zoeken. Profielschrijvers op zoek naar een vaste relatie bleken vaker positieve emotiewoorden te gebruiken die vooral belangrijk zijn wanneer je een partner voor de langere termijn zoekt, zoals interne persoonlijkheidskenmerken en -kwaliteiten (bijv. “betrouwbaar”, “eerlijk”, “serieus”). Daarbij bleken de teksten van deze groep mensen meer woorden en meer referenties naar zichzelf te bevatten, wat zou kunnen duiden op de onthulling van meer persoonlijke informatie. De bevindingen van deze studie suggereren dat het doel om een vaste relatie

te vinden zowel bewust als onbewust effect kan hebben op het talige gedrag van onlinedaters: onbewust door meer automatisch geproduceerde zelfreferenties te gebruiken (bijv. “ik”) en bewust door, strategisch, bepaalde persoonlijkheidskenmerken te noemen die belangrijk worden geacht in een vaste relatie.

Studie 2

De tweede studie (hoofdstuk 3) keek naar de invloed van taalfouten in onlinedatingprofielen op impressievorming middels twee experimentele studies waaraan datingsitegebruikers deelnamen. Ten eerste bekeken we of taalfouten in profielteksten een negatief effect hebben op percepties van aantrekkelijkheid van profieleigenaren en intenties om te daten met de profieleigenaar. Daarnaast onderzochten we of dit negatieve effect van taalfouten op indrukken over aantrekkelijkheid en date-intenties sterker was wanneer er geen andere informatie, in de vorm van een zichtbare profielfoto, aanwezig was en indrukken dus alleen gevormd konden worden op basis van de profieltekst. Taalfouten en de zichtbaarheid van de foto bleken verschillende effecten te hebben op date-intenties en de twee dimensies van aantrekkelijkheid die we onderscheidde: sociaal-romantische aantrekkelijkheid aan de ene kant en fysieke aantrekkelijkheid aan de andere kant. De resultaten lieten namelijk zien dat taalfouten geen effect hebben op indrukken over fysieke aantrekkelijkheid en date-intenties, maar wel op sociaal-romantische aantrekkelijkheid. Dit negatieve effect van taalfouten op aantrekkelijkheid werd met name gevonden bij de groep participanten die aangaven de fouten in de teksten te hebben opgemerkt. Aan de andere kant bleek de zichtbaarheid van de profielfoto geen effect te hebben op sociale en romantische aantrekkelijkheid en date-intenties maar wel op fysieke aantrekkelijkheid: participanten beoordeelden profieleigenaren met zichtbare foto's als fysiek aantrekkelijker dan profieleigenaren met een vervaagde foto. Of de foto zichtbaar was of niet, had geen effect had op hoe zwaar de taalfouten wogen: er waren geen interactie-effecten van taalfouten en fotozichtbaarheid.

Het tweede deel van de studie richtte zich vervolgens op de onderliggende processen die de relatie tussen taalfouten en indrukken van aantrekkelijkheid en date-intenties konden verklaren. Vier typen profielteksten werden daarvoor geconstrueerd: teksten met typfouten (bijv. “hte” in plaats van “het”), teksten met regel-gebaseerde fouten (bijv. “intressant” in plaats van “interessant”), teksten met informele fouten (bijv. “:-D”, “hallo!!!”), en teksten zonder fouten. De verwachting was dat deze drie soorten taalfouten elk geassocieerd zouden worden met verschillende persoonlijkheidskenmerken: typfouten met (on)zorgvuldigheid, regel-gebaseerde fouten met (gebrek aan) intelligentie, en informele fouten met warmte. Zoals verwacht lieten de resultaten zien dat typfouten en regel-gebaseerde taalfouten leidden tot lagere scores op percepties van, respectievelijk, zorgvuldigheid en intelligentie, wat vervolgens indrukken over aantrekkelijkheid en

date-intenties negatief beïnvloedde. Taalfouten hebben effect op de indrukken die worden gevormd over date-intenties en de persoonlijkheid en aantrekkelijkheid van de profieleigenaar, en dat laat zien dat taalfouten dienen als een belangrijk cue voor indrukvorming.

Studie 3

De derde studie (hoofdstuk 4) keek naar de vraag hoe mensen datingprofielen met een profielfoto en -tekst visueel verwerken, en hoe cues in beide componenten indrukvorming beïnvloedden. Om dit te kunnen onderzoeken, verzamelden we zowel eye-tracking- als perceptiedata: participanten bekeken verschillende profielen die een profielfoto en -tekst bevatten. Deze profielen bevatten wel of geen taalfouten en varieerden systematisch in de aantrekkelijkheid van de foto's (i.e., aantrekkelijk, gemiddeld aantrekkelijk, en onaantrekkelijke foto's). Na het bekijken van een profiel beoordeelden participanten de fysieke, sociale, en romantische aantrekkelijkheid van de profieleigenaar. De eyetracking-resultaten lieten zien dat mensen vaker eerst naar een profielfoto kijken, meer en langer kijken naar aantrekkelijkere foto's, en dat ze ongeacht de aantrekkelijkheid van de foto aandacht besteden aan de tekst. De perceptiedata lieten zien dat zowel cues in de foto als in de tekst effect hadden op de indrukken die werden gevormd van de eigenaar van het profiel, maar dat de effecten verschillend waren voor de verschillende dimensies van aantrekkelijkheid: aantrekkelijkere foto's zorgden voor hogere scores op waargenomen fysieke, sociale, en romantische aantrekkelijkheid, terwijl taalfouten wel een negatieve invloed hadden op indrukken van sociale en romantische aantrekkelijkheid, maar niet op die van fysieke aantrekkelijkheid. Het verwachte interactie-effect van taalfouten en foto-aantrekkelijkheid werd ook alleen gevonden voor fysieke aantrekkelijkheid. Dit suggereert dat taalfouten een negatief effect hebben op fysieke aantrekkelijkheid als een profiel een gemiddeld aantrekkelijke foto bevat, maar niet wanneer dit een aantrekkelijke of onaantrekkelijke foto is.

Op basis van onze resultaten presenteerden wij een model, het *Multimodal Information Processing* (MIP) model, dat drie fases onderscheidt: de verwerkingsfase waarin mensen de profielfoto en -tekst onafhankelijk van elkaar verwerken (met veelal de foto als eerst), de cue-beoordelingsfase waarin mensen de cues op de profielfoto en -tekst los van elkaar beoordelen, en de impressievormingsfase waarin mensen de (cues op) beide profielcomponenten gebruiken om indrukken te vormen over de verschillende dimensies van aantrekkelijkheid.

Studie 4

De vierde studie (hoofdstuk 5) richtte zich op waargenomen originaliteit in datingprofielteksten en bestond uit twee onderdelen: een perceptiestudie en een inhoudsanalyse. De perceptiestudie onderzocht de relatie tussen de waargenomen originaliteit van een profieltekst, indrukken over

(minder) gewenste persoonlijkheidskenmerken in een mogelijke partner, en indrukken over de aantrekkelijkheid en datepotentie van de profieleigenaar. Om dit te kunnen onderzoeken kregen onlinedatingsitegebruikers een of meerdere authentieke datingprofielteksten te zien (allemaal in combinatie met een vervaagde foto) en evalueerden ze de originaliteit van de profieltekst, de fysieke, sociale en romantische aantrekkelijkheid van de profieleigenaar, en intenties om de profieleigenaar te daten. Daarnaast beoordeelden ze de profieleigenaren op drie persoonlijkheidskenmerken die vaak worden geassocieerd met (tekst)originaliteit: intelligentie, gevoel voor humor, en eigenaardigheid. De waargenomen originaliteit van een profieltekst had effect op indrukvorming, en dan met name op een positieve manier: eigenaren van profielen die hoog scoorden op tekstoriginaliteit werden gezien als intelligenter en grappiger, wat er vervolgens voor zorgde dat ze ook als aantrekkelijker (datemateriaal) werden beoordeeld. Schrijvers van originele profielteksten werden, tegen de verwachting, niet vreemder gevonden dan schrijvers van onoriginele teksten, en indrukken van eigenaardigheid medieerden niet het effect tussen profieltekstoriginaliteit en aantrekkelijkheid.

Het doel van de inhoudsanalyse die volgde was een beter beeld krijgen van de specifieke tekstkenmerken die ervoor zorgen dat authentieke profielteksten origineel worden gevonden. Alle profielteksten van de perceptiestudie werden daarom (handmatig en automatisch) gecodeerd op 15 kenmerken die we op basis van een eerdere (kwalitatieve) inhoudsanalyse hadden geïdentificeerd. Deze kenmerken betroffen de stijl van de tekst (bijv. metafoor), de persoonlijke informatie die werd onthuld in de tekst (bijv. concreetheid van de onthulde informatie), of de focus in het profiel op de schrijver zelf of de ander (bijv. jij-referenties). Een hiërarchische multi-pele regressie-analyse liet zien dat voornamelijk de stilistische - en zelfonthullingskenmerken de variantie in tekstoriginaliteitscores verklaarden. Profielen met metaforen scoorden hoger op tekstoriginaliteit, net als teksten die meer en concretere persoonlijke informatie bevatten, en teksten die niet (volledig) vanuit een ik-perspectief geschreven waren. Deze bevindingen tonen aan dat waargenomen originaliteit in profielteksten een veelzijdig construct is dat zich zowel in inhoud (door het gebruik van zelfonthulling) als vorm (door het gebruik van metaforen) kan manifesteren.

Antwoorden op Centrale Onderzoeksvragen

De eerste centrale onderzoeksvraag was *of en hoe* taalgebruik in datingprofielteksten informatie over profieleigenaren onthult. Dit proefschrift laat zien dat profielteksten inderdaad in talig opzicht van elkaar kunnen verschillen afhankelijk van de date-intenties van schrijvers en de (waargenomen) originaliteit van de tekst. Met behulp van zowel automatische als handmatige tekstanalyses hebben we geïllustreerd op welke manieren taalgebruik in profielteksten kan verschillen: mensen op zoek

naar een vaste relatie lijken meer persoonlijke informatie te onthullen en vaker interne persoonlijkheidskenmerken te noemen, en originelere profielteksten lijken van minder originele teksten te verschillen in het voorkomen van metaforen en (concrete) persoonlijke informatie.

De tweede centrale onderzoeksvraag ging over de mate waarin mensen cues in profielteksten en -foto's gebruiken wanneer ze indrukken vormen over de aantrekkelijkheid van profieleigenaren, en hoe zwaar de tekstuele cues wegen in verhouding tot cues in foto's. Deze dissertatie liet zien dat mensen cues van zowel de profieltekst als de -foto gebruiken om de aantrekkelijkheid van een profieleigenaar te beoordelen, maar dat de effecten van foto's hierbij sterker zijn dan die van teksten. De effecten van teksten bleken desondanks redelijk robuust en niet te worden afgezwakt door informatie op de foto.

De derde centrale onderzoeksvraag focusten op de onderliggende processen die de relatie tussen talige cues en impressies van aantrekkelijkheid kunnen verklaren. Dit proefschrift laat zien dat mensen informatie over specifieke persoonlijkheidskenmerken (bijv. (gebrek aan) intelligentie, zorgvuldigheid, gevoel voor humor) afleiden uit teksten en dat de aantrekkelijkheid van deze persoonlijkheidskenmerken in een partner vervolgens de effecten op waargenomen aantrekkelijkheid en date-intenties bepalen. Daarbij laten onze studies zien dat cues in profielteksten vooral indrukken over sociale en romantische aantrekkelijkheid beïnvloeden, maar niet die over fysieke aantrekkelijkheid.

Implicaties

De bevindingen in dit proefschrift hebben geleid tot een aantal bijdragen aan de bestaande theorie, die inhaken op de verschillende fasen van datingprofiel-evaluatie. Ten eerste, als het gaat om profielconstructie heeft deze dissertatie nieuwe inzichten opgeleverd over de manieren waarop taalgebruik in datingprofielteksten kan verschillen afhankelijk van tekst- en schrijverskenmerken. Dit proefschrift benadrukt daarbij dat het – om een beter beeld te krijgen van het taalgebruik in profielteksten – waardevol kan zijn om verschillende soorten (automatisch en handmatig te coderen) tekstenkenmerken te bekijken en verschillende tekstanalysemethodes te gebruiken.

Ten tweede, voor het verwerken van cues hebben we gevonden dat mensen op multimodale onlinedatingprofielen zowel aandacht hebben voor de profiefoto als voor de profieltekst. Het is aannemelijk dat de cues die worden opgemerkt vervolgens worden gebruikt om indrukken te vormen over de aantrekkelijkheid van profieleigenaren. Dit verwerken van foto's en teksten lijkt altijd te gebeuren ongeacht welke specifieke informatie de andere modaliteit toont. Het lijkt dus of het verwerken van foto en tekst twee relatief onafhankelijke processen zijn die na elkaar plaatsvinden.

Ten derde benadrukken onze studies wat betreft impressievorming het belang van taalgebruik als een cue voor het vormen van indrukken, en dan met name indrukken over de persoonlijkheid, aantrekkelijkheid en datepotentieel van profieleigenaren. Onze studies lieten zien dat associaties tussen bepaalde talige cues en (gewenste of ongewenste) persoonlijkheidskenmerken in een partner de positieve en negatieve effecten op waargenomen aantrekkelijkheid kunnen verklaren. Tot slot biedt deze thesis een nieuwe kijk op het multidimensionale karakter van waargenomen aantrekkelijkheid. Onze studies lijken aan te tonen dat mensen verschillende profielcomponenten relateren aan verschillende dimensies van aantrekkelijkheid: (cues in) teksten aan indrukken over sociale aantrekkelijkheid, en (cues in) foto's aan indrukken over fysieke – en in mindere mate sociale – aantrekkelijkheid.

Tot slot leiden de resultaten van dit proefschrift ook tot enkele praktische implicaties voor onlinedaters en eigenaren van datingplatformen. Onlinedaters wordt aangeraden om altijd tijd en moeite te steken in de foto *en* de tekst, en zowel aandacht te besteden aan *wat* als *hoe* iets wordt opgeschreven. Daarbij kunnen alle soorten taalfouten het best worden vermeden, terwijl het schrijven van een originele profieltekst juist een aanrader is. Eigenaren van datingplatformen wordt geadviseerd om leden een profiel te laten construeren dat bestaat uit meerdere profielcomponenten. Ook moeten zij zich ervan bewust zijn dat de manier waarop zij verschillende componenten weergeven op een profiel effect kan hebben op hoe de profielen verwerkt, en vervolgens geëvalueerd, worden. Al met al bieden de resultaten van dit proefschrift nieuwe inzichten die zowel theoretisch als praktisch relevant zijn.

References

- Aggarwal, C. C., & Zhai, C. (2012). A survey of text classification algorithms. In C. C. Aggarwal & C. Zhai (Eds.), *Mining Text Data* (pp. 163-222). Boston, MA: Springer.
- Agnew, C. R., Van Lange, P. A., Rusbult, C. E., & Langston, C. A. (1998). Cognitive interdependence: Commitment and the mental representation of close relationships. *Journal of Personality and Social Psychology*, *74*, 939-954.
- Akehurst, J., Koprinska, I., Yacef, K., Pizzato, L., Kay, J., & Rej, T. (2011). Explicit and implicit user preferences in online dating. In *Proceedings of 15th Pacific-Asia Conference on Advances in Knowledge Discovery and Data Mining* (pp. 15-27).
- Altman, I., & Taylor, D. A. (1973). *Social penetration: The development of interpersonal relationships*. Oxford, UK: Holt, Rinehart & Winston.
- Ashton, M. C., & Lee, K. (2012). Oddity, Schizotypy/Dissociation, and Personality. *Journal of Personality*, *80*, 113-134.
- Bar, M., Neta, M., & Linz, H. (2006). Very first impressions. *Emotion*, *6*, 269-278.
- Barry, A. M. (1997). *Visual intelligence: Perception, image, and manipulation in visual communication*. Albany, NY: State University of New York Press.
- Bates, D., Maechler, M., Bolker, B., & Walker, S. (2014). lme4: Linear Mixed-Effects Models Using Eigen and S4. R Package Version 1.1-6. Available at: <http://cran.r-project.org/package=lme4>.
- Berger, C. R., & Calabrese, R. J. (1975). Some explorations in initial interaction and beyond: Toward a developmental theory of interpersonal communication. *Human Communication Research*, *1*, 99-112.
- Berger, J., & Packard, G. (2018). Are atypical things more popular?. *Psychological Science*, *29*, 1178-1184.
- Berscheid, E. & Regan, P. C. (2005). *The psychology of interpersonal relationships*. Mahwah, NJ: Pearson Prentice Hall.
- Boot, P., Zijlstra, H., & Geenen, R. (2017). The Dutch translation of the Linguistic Inquiry and Word Count (LIWC) 2007 dictionary. *Dutch Journal of Applied Linguistics*, *6*, 65-76.
- Boyd R.L. (2017) Psychological Text Analysis in the Digital Humanities. In S. Hai-Jew (Ed.), *Data Analytics in Digital Humanities, Multimedia Systems and Applications* (pp. 161-189). New York, NY: Springer.
- Brand, R. J., Bonatsos, A., D’Orazio, R., & DeShong, H. (2012). What is beautiful is good, even online: Correlations between photo attractiveness and text attractiveness in men’s online dating profiles. *Computers in Human Behavior*, *28*, 166-170.
- Breiman, L., Friedman, J. H., Olshen, R. A., & Stone, C. J. (1984). *Classification and regression trees*. Monterey, CA: Wadsworth Publishing.

References

- Brückl, M., & Heuer, F. (2018). Coefficients of Interrater Reliability - Generalized for Randomly Incomplete Datasets. R Package Version 0.1.4. Available at <https://cran.r-project.org/web/packages/irrNA/index.html>
- Bucher, H. J., & Schumacher, P. (2006). The relevance of attention for selecting news content. An eye-tracking study on attention patterns in the reception of print and online media. *Communications, 31*, 347-368.
- Burgoon, J. K., & Jones, S. B. (1976). Toward a theory of personal space expectations and their violations. *Human Communication Research, 2*, 131-146.
- Burgoon, M., & Miller, G.R. (1985). An expectancy interpretation of language and persuasion. In H. Giles & R. Clair (Eds.). *The social and psychological contexts of language* (pp. 199–229). London, UK: Lawrence Erlbaum Associates.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*, 1-14.
- Buss, D. M., & Barnes, M. (1986). Preferences in human mate selection. *Journal of Personality and Social Psychology, 50*, 559-570.
- Buunk, B. P., Dijkstra, P., Fetchenhauer, D., & Kenrick, D. T. (2002). Age and gender differences in mate selection criteria for various involvement levels. *Personal Relationships, 9*, 271-278.
- Campbell, W. K. (1999). Narcissism and romantic attraction. *Journal of Personality and Social Psychology, 77*, 1254-1270.
- Carroll, P. J., Young, J. R., & Guertin, M. S. (1992). Visual analysis of cartoons: A view from the far side. In K. Rayner (Ed.), *Eye movements and visual cognition: Scene perception and reading* (pp. 444-461). New York, NY: Springer.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39*, 752-766.
- Chaiken, S. (1987). The heuristic model of persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman (Eds.), *Social influence: The Ontario Symposium* (Vol. 5, pp. 3-39). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Chaiken, S., & Eagly, A. H. (1976). Communication modality as a determinant of message persuasiveness and message comprehensibility. *Journal of Personality and Social Psychology, 34*, 605–614.
- Chan, L. S. (2017). Who uses dating apps? Exploring the relationships among trust, sensation-seeking, smartphone use, and the intent to use dating apps based on the Integrative Model. *Computers in Human Behavior, 72*, 246-258.
- Clark, H. (1996). *Using Language*. Cambridge, UK: Cambridge University Press.

- Clatterbuck, G. W. (1979). Attributional confidence and uncertainty in initial interaction. *Human Communication Research*, 5, 147-157.
- Clemens, C., Atkin, D., & Krishnan, A. (2015). The influence of biological and personality traits on gratifications obtained through online dating websites. *Computers in Human Behavior*, 49, 120-129.
- Coupland, J. (1996). Dating advertisements: Discourses of the commodified self. *Discourse & Society*, 7, 187-207.
- D'Angelo, J., & Van Der Heide, B. (2016). The formation of physician impressions in online communities: Negativity, positivity, and nonnormativity effects. *Communication Research*, 43, 49-72.
- D'Angelo, J., Zhang, C., Eickhoff, J., & Moreno, M. (2014). Facebook influence among incoming college freshmen: sticky cues and alcohol. *Bulletin of Science, Technology & Society*, 34, 13-20.
- Davis, E. M., & Fingerman, K. L. (2016). Digital dating: Online profile content of older and younger adults. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 71, 959-967.
- De Saussure, F. (1916). *Course de linguistique générale*. Paris, FR: Payot.
- Diaz, F., Metzler, D., & Amer-Yahia, S. (2010). Relevance and ranking in online dating systems. In *Proceedings of the 33rd International ACM SIGIR Conference on Research and Development in Information Retrieval* (pp. 66-73).
- Dion, K., Berscheid, E., & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, 24, 285-290.
- Donath, J. S. (1999). Identity and deception in the virtual community. In M. A. Smith & P. Kollock (Eds.), *Communities in Cyberspace* (pp. 29-59). New York: Routledge.
- Dunning, T. (1993). Accurate methods for the statistics of surprise and coincidence. *Computational Linguistics*, 19, 61-74.
- Eastwick, P. W., & Finkel, E. J. (2008). Sex differences in mate preferences revisited: Do people know what they initially desire in a romantic partner? *Journal of Personality and Social Psychology*, 94, 245-264.
- Eastwick, P. W., Keneski, E., Morgan, T. A., McDonald, M. A., & Huang, S. A. (2018). What do short-term and long-term relationships look like? Building the relationship coordination and strategic timing (ReCAST) model. *Journal of Experimental Psychology: General*, 147, 747-781.
- eHarmony (n.d.). Online dating profile clichés to avoid – and how to write an original profile. Retrieved from: <https://www.eharmony.co.uk/dating-advice/start-with-you/online-dating-profile-cliches-to-avoid-and-how-to-write-an-original-profile>

References

- Eitel, A., Scheiter, K., & Schüler, A. (2013). How inspecting a picture affects processing of text in multimedia learning. *Applied Cognitive Psychology, 27*, 451-461.
- Ellison, N.B., Hancock, J.T., Toma, C.L. (2012). Profile as promise: A framework for conceptualizing veracity in online dating self-presentations. *New Media & Society, 14*, 45-62.
- Ellison, N., Heino, R., & Gibbs, J. (2006). Managing impressions online: Self-presentation processes in the online dating environment. *Journal of Computer-Mediated Communication, 11*, 415-441.
- Figueredo, L., & Varnhagen, C. K. (2005). Didn't you run the spell checker? Effects of type of spelling error and use of a spell checker on perceptions of the author. *Reading Psychology, 26*, 441-458.
- Finkel, E. J., Eastwick, P. W., Karney, B. R., Reis, H. T., & Sprecher, S. (2012). Online dating: A critical analysis from the perspective of psychological science. *Psychological Science in the Public Interest, 13*, 3-66.
- Fiore, A. T., Taylor, L. S., Mendelsohn, G. A., & Hearst, M. (2008). Assessing attractiveness in online dating profiles. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 797-806).
- Form, S. (2019). Reaching Wuthering Heights with Brave New Words: The Influence of Originality of Words on the Success of Outstanding Best-Sellers. *The Journal of Creative Behavior, 53*, 508-518.
- Gallant, S., Williams, L., Fisher, M., & Cox, A. (2011). Mating strategies and self-presentation in online personal advertisement photographs. *Journal of Social, Evolutionary, and Cultural Psychology, 5*, 106-121.
- Gallois, C., Ogay, T., & Giles, H. (2005). Communication accommodation theory: A look back and a look ahead. In W. B. Gudykunst (Ed.), *Theorizing about intercultural communication* (pp. 121-148). Thousand Oaks, CA: Sage.
- Gao, Z., Yang, Q., Ma, X., Becker, B., Li, K., Zhou, F., & Kendrick, K. M. (2017). Men who compliment a woman's appearance using metaphorical language: Associations with creativity, masculinity, intelligence and attractiveness. *Frontiers in Psychology, 8*: 2185.
- Garcia, S., Stinson, L., Ickes, W., Bissonnette, V., & Briggs, S. R. (1991). Shyness and physical attractiveness in mixed-sex dyads. *Journal of Personality and Social Psychology, 61*, 35-49.
- Gibbs, J. L., Ellison, N. B., & Heino, R. D. (2006). Self-presentation in online personals: The role of anticipated future interaction, self-disclosure, and perceived success in Internet dating. *Communication Research, 33*, 152-177.
- Gibbs, J. L., Ellison, N. B., & Lai, C. H. (2011). First comes love, then comes Google: An investigation of uncertainty reduction strategies and self-disclosure in online dating. *Communication Research, 38*, 70-100.

- Giles, H., Coupland, N., & Coupland, J. (1991). 1. Accommodation theory: Communication, context, and consequence. In H. Giles, J. Coupland, N. Coupland (Eds.), *Contexts of Accommodation* (pp. 1–68). New York, NY: Cambridge University Press.
- Gill, A. J., French, R. M., Gergle, D., & Oberlander, J. (2008). The language of emotion in short blog texts. In *Proceedings of the ACM Conference on Computer Supported Cooperative work* (pp. 299-302).
- Gómez-Adorno, H., Pinto, D., Montes, M., Sidorov, G., & Alfaro, R. (2014). Content and style features for automatic detection of users' intentions in tweets. In *Ibero-American Conference on Artificial Intelligence* (pp. 120-128).
- Greengross, G., & Miller, G. (2011). Humor ability reveals intelligence, predicts mating success, and is higher in males. *Intelligence*, 39, 188-192.
- Groom, C. J., & Pennebaker, J. W. (2005). The language of love: Sex, sexual orientation, and language use in online personal advertisements. *Sex Roles*, 52, 447-461.
- Hancock, J. T., & Dunham, P. J. (2001). Impression formation in computer-mediated communication revisited: An analysis of the breadth and intensity of impressions. *Communication Research*, 28, 325-347.
- Hancock, J. T., Landrigan, C., & Silver, C. (2007). Expressing emotion in text-based communication. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 929-932).
- Hancock, J. T., & Toma, C. L. (2009). Putting your best face forward: The accuracy of online dating photographs. *Journal of Communication*, 59, 367-386.
- Hård af Segerstad, Y. H. (2002). *Use and adaptation of written language to the conditions of computer-mediated communication* (Doctoral dissertation, Göteborg University, Göteborg, Sweden). Retrieved from <http://nl.ijs.si/janes/wp-content/uploads/2014/09/segerstad02.pdf>
- Hayes, A.F. (2013). *Introduction to mediation, moderation, and conditional process analysis: a regression-based approach*. London, UK: Guilford Press.
- Hitsch, G. J., Hortaçsu, A., & Ariely, D. (2010). What makes you click?—Mate preferences in online dating. *Quantitative Marketing and Economics*, 8, 393-427.
- Holsanova, J. (2014): 20. Reception of multimodality: Applying eye tracking methodology in multimodal research. In: C. Jewitt (Ed.), *Routledge Handbook of Multimodal Analysis* (pp. 285-296). London, UK: Routledge.
- Huffaker, D. A., & Calvert, S. L. (2005). Gender, identity, and language use in teenage blogs. *Journal of Computer-Mediated Communication*, 10, 1-10.
- Janssen, D.M.L. & Jansen, F. (2016). Fatale spelfouten? Een experimenteel onderzoek naar de manier waarop spelfouten in sollicitatie- en sponsorbrieven de besluitvorming beïnvloeden [Fatal spelling errors? An experimental study into the way in which spelling errors in application and sponsorship letters affect decision making]. *Tijdschrift voor Taalbeheersing*, 38, 81-106.

References

- Jones, R. H. (2015). Introduction. In R. H. Jones (Ed.), *The Routledge Handbook of Language and Creativity*. New York, NY: Routledge.
- Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY: Farrar, Straus, and Giroux.
- Kaufman, S. B., & Kozbelt, A. (2009). The tears of a clown: Understanding comedy writers. In S. B. Kaufman & J. C. Kaufman (Eds.), *The Psychology of Creative Writing* (pp. 80-97). Cambridge, UK: Cambridge University Press.
- Kaufman, S. B., Kozbelt, A., Bromley, M. L., & Miller, G. R. (2008). The role of creativity and humor in human mate selection. In G. Geher & G. Miller (Eds.), *Mating intelligence: Sex, relationships, and the mind's reproductive system* (p. 227-262). New York, NY: Lawrence Erlbaum Associates.
- Kloet, L., Renkema, J., & Van Wijk, C. (2003). Waarom foutloos schrijven? Het effect van taalfouten op tekstwaardering, imago en overtuigingskracht [Why write faultlessly? The effect of language errors on text appreciation, image and persuasiveness]. In L. van Waes, P. Cuvelier, G. Jacobs, & I. de Ridder (Eds.), *Studies in Taalbeheersing* (pp. 270-279). Assen, NL: Koninklijke Van Gorcum BV.
- Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, 15, 155-163.
- Kreiner, D. S., Schnakenberg, S. D., Green, A. G., Costello, M. J., & McClain, A. F. (2002). Effects of spelling errors on the perception of writers. *The Journal of General Psychology*, 129, 5-17.
- Kuznetsova, A., Brockhoff, P. B., & Christensen, R. H. B. (2014). lmerTest: Tests for Random and Fixed Effects for Linear Mixed Effect Models (lmer Objects of lme4 Package). R Package Version 2.0-6. Available at: <http://cran.r-project.org/package=lmerTest>
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159-174.
- Lange, B. P., & Euler, H. A. (2014). Writers have groupies, too: High quality literature production and mating success. *Evolutionary Behavioral Sciences*, 8, 20-30.
- Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. (2000). Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin*, 126, 390-423.
- Laurenceau, J. P., Barrett, L. F., & Pietromonaco, P. R. (1998). Intimacy as an interpersonal process: the importance of self-disclosure, partner disclosure, and perceived partner responsiveness in interpersonal exchanges. *Journal of Personality and Social Psychology*, 74, 1238-1251.
- Lea, M., & Spears, R. (1992). Paralanguage and social perception in computer-mediated communication. *Journal of Organizational Computing and Electronic Commerce*, 2, 321-341.
- Leach, C. W., Ellemers, N., & Barreto, M. (2007). Group virtue: the importance of morality (vs. competence and sociability) in the positive evaluation of in-groups. *Journal of Personality and Social Psychology*, 93, 234-249.

- LeBoutillier, N., & Marks, D. F. (2003). Mental imagery and creativity: A meta-analytic review study. *British Journal of Psychology*, *94*, 29-44.
- Leder, H., Mitrovic, A., & Goller, J. (2016). How beauty determines gaze! facial attractiveness and gaze duration in images of real world scenes. *i-Perception*, *7*: 2041669516664355.
- Leder, H., Tinio, P. P., Fuchs, I. M., & Bohrn, I. (2010). When attractiveness demands longer looks: The effects of situation and gender. *Quarterly Journal of Experimental Psychology*, *63*, 1858-1871.
- Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. (2002). The necessities and luxuries of mate preferences: testing the tradeoffs. *Journal of Personality and Social Psychology*, *82*, 947-955.
- Li, N. P., & Kenrick, D. T. (2006). Sex similarities and differences in preferences for short-term mates: what, whether, and why. *Journal of Personality and Social Psychology*, *90*, 468-489.
- Lindauer, M. S. (2009). Literary Creativity and Physiognomy: Expressiveness in Writers, Readers, and Literature. In S. B. Kaufman & J. C. Kaufman (Eds.), *The Psychology of Creative Writing* (pp. 117-130). Cambridge, UK: Cambridge University Press.
- Lo, S. K., Hsieh, A. Y., & Chiu, Y. P. (2013). Contradictory deceptive behavior in online dating. *Computers in Human Behavior*, *29*, 1755-1762.
- Locher, P., Unger, R., Sociedade, P., & Wahl, J. (1993). At first glance: Accessibility of the physical attractiveness stereotype. *Sex Roles*, *28*, 729-743.
- Luo, S., & Toney, S. (2015). Can texting be used to improve romantic relationships? – The effects of sending positive text messages on relationship satisfaction. *Computers in Human Behavior*, *49*, 670-678.
- Maner, J. K., Kenrick, D. T., Becker, D. V., Delton, A. W., Hofer, B., Wilbur, C. J., & Neuberg, S. L. (2003). Sexually selective cognition: beauty captures the mind of the beholder. *Journal of Personality and Social Psychology*, *85*, 1107-1120.
- Markowitz, D.M., Hancock, J.T., & Tong, S.T. (2018). Interpersonal Dynamics in Online Dating: Profiles, Matching, and Discovery. In Z. Papacharissi (Ed.), *A Networked Self and Love*. New York, NY: Routledge.
- Masden, C., & Edwards, W. K. (2015). Understanding the role of community in online dating. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 535-544).
- McAdams, D. P., Healy, S., & Krause, S. (1984). Social motives and patterns of friendship. *Journal of Personality and Social Psychology*, *47*, 828-838.
- McCroskey, J. C., & McCain, T. A. (1974). The measurement of interpersonal attraction. *Speech Monograph*, *41*, 261-266.
- McGloin, R., & Denes, A. (2018). Too hot to trust: Examining the relationship between attractiveness, trustworthiness, and desire to date in online dating. *New Media & Society*, *20*, 919-936.

References

- Miller, A. G. (1970). Role of physical attractiveness in impression formation. *Psychonomic Science*, *19*, 241-243.
- Miller, G. F. (2000). *The mating mind: how sexual choice shaped the evolution of human nature*. New York, NY: Doubleday.
- Mitrovic, A., Tinio, P. P., & Leder, H. (2016). Consequences of beauty: Effects of rater sex and sexual orientation on the visual exploration and evaluation of attractiveness in real world scenes. *Frontiers in Human Neuroscience*, *10*: 122.
- Murdock, M. C., & Ganim, R. M. (1993). Creativity and humor: Integration and incongruity. *The Journal of Creative Behavior*, *27*, 57-70.
- Nettle, D. (2009). The evolution of creative writing. In S. B. Kaufman & J. C. Kaufman (Eds.), *The Psychology of Creative Writing* (pp. 101-116). Cambridge, UK: Cambridge University Press.
- Nettle, D., & Clegg, H. (2006). Schizotypy, creativity and mating success in humans. *Proceedings of the Royal Society B: Biological Sciences*, *273*, 611-615.
- Nguyen, D., Gravel, R., Trieschnigg, D., & Meder, T. (2013). "How old do you think I am?" A study of language and age in Twitter. In *Proceedings of the 7th International Conference on Weblogs and Social Media* (pp. 857-862).
- Nosek, B. A., Ebersole, C. R., DeHaven, A. C., & Mellor, D. T. (2018). The preregistration revolution. In *Proceedings of the National Academy of Sciences*, *155*, 2600-2606.
- Olson, I. R., & Marshuetz, C. (2005). Facial attractiveness is appraised at a glance. *Emotion*, *5*, 186-201.
- Oostdijk, N., Reynaert, M., Hoste, V., & Van den Heuvel, H. (2013). *SoNaR User Documentation*, version 1.0.4.
- Paivio, A. (1990). *Mental representations: A dual coding approach* (Vol. 9). New York, NY: Oxford University Press.
- Paltoglou, G., & Thelwall, M. (2012). Twitter, MySpace, Digg: Unsupervised sentiment analysis in social media. *ACM Transactions on Intelligent Systems and Technology*, *3*: 66.
- Pander Maat, H., Kraf, R., Van den Bosch, A., Dekker, N., Van Gompel, M., Kleijn, S., Sanders, T., & Van der Sloot, K. (2014). T-Scan: a new tool for analyzing Dutch text. *Computational Linguistics in the Netherlands Journal*, *4*, 53-74.
- Parkhurst, H. B. (1999). Confusion, lack of consensus, and the definition of creativity as a construct. *The Journal of Creative Behavior*, *33*, 1-21.
- Pennebaker, J. W. (2011). *The secret life of pronouns: What our words say about us*. New York, NY: Bloomsbury Press.
- Pennebaker, J. W., Booth, R. J., Boyd, R. L., & Francis, M. E. (2015). *Linguistic inquiry and word count: LIWC 2015 [Computer software]*. Austin, TX: Pennebaker Conglomerates (www.LIWC.net).

- Pennebaker, J. W., & King, L. A. (1999). Linguistic styles: language use as an individual difference. *Journal of Personality and Social Psychology, 77*, 1296-1312.
- Pennebaker, J. W., Mehl, M. R., & Niederhoffer, K. G. (2003). Psychological aspects of natural language use: Our words, our selves. *Annual Review of Psychology, 54*, 547-577.
- Pennebaker, J. W., & Stone, L. D. (2003). Words of wisdom: language use over the life span. *Journal of Personality and Social Psychology, 85*, 291-301.
- Peter, J., & Valkenburg, P. M. (2007). Who looks for casual dates on the internet? A test of the compensation and the recreation hypotheses. *New Media & Society, 9*, 455-474.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 19, pp. 123-205). New York, NY: Academic Press.
- Powell, T. E., Boomgaarden, H. G., De Swert, K., & De Vreese, C. H. (2019). Framing fast and slow: A dual processing account of multimodal framing effects. *Media Psychology, 22*, 572-600.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891.
- Proyer, R. T., & Brauer, K. (2018). Exploring adult playfulness: Examining the accuracy of personality judgments at zero-acquaintance and an LIWC analysis of textual information. *Journal of Research in Personality, 73*, 12-20.
- Queen, R., & Boland, J. E. (2015). I think your going to like me: Exploring the role of errors in email messages on assessments of potential housemates. *Linguistics Vanguard, 1*, 283-293.
- Qiu, L., Lin, H., Ramsay, J., & Yang, F. (2012). You are what you tweet: Personality expression and perception on Twitter. *Journal of Research in Personality, 46*, 710-718.
- Rangel, F., & Rosso, P. (2013). Use of language and author profiling: Identification of gender and age. In *10th International Workshop on Natural Language Processing and Cognitive Science* (pp. 177-186).
- Rangel, F., & Rosso, P. (2016). On the impact of emotions on author profiling. *Information Processing & Management, 52*, 73-92.
- Ranzini, G., & Lutz, C. (2017). Love at first swipe? Explaining Tinder self-presentation and motives. *Mobile Media & Communication, 5*, 80-101.
- Rayner, K. (1998). Eye movements in reading and information processing: 20 years of research. *Psychological Bulletin, 124*, 372-422.
- Rayner, K., Rotello, C. M., Stewart, A. J., Keir, J., & Duffy, S. A. (2001). Integrating text and pictorial information: eye movements when looking at print advertisements. *Journal of Experimental Psychology: Applied, 7*, 219-226.

References

- Regan, P. C., Levin, L., Sprecher, S., Christopher, F. S., & Gate, R. (2000). Partner preferences: What characteristics do men and women desire in their short-term sexual and long-term romantic partners? *Journal of Psychology & Human Sexuality, 12*, 1-21.
- Rosen L. D., Cheever N. A., Cummings C., & Felt J. (2008). The impact of emotionality and self-disclosure on online dating versus traditional dating. *Computers in Human Behavior, 24*, 2124–2157.
- Ross (2017). *This is Officially the Most Popular Way People are Meeting Their Spouse*. Retrieved from: <https://www.theknot.com/content/online-dating-most-popular-way-to-meet-spouse> (Retrieved May 13, 2019).
- Runco, M. A. (2009). 25. Parsimonious creativity and its measurement. In *Proceedings of the Conference "Can Creativity be Measured?"* (pp. 393-405).
- Runco, M.A., & Jaeger, G.J. (2012). The standard definition of creativity. *Creativity Research Journal, 24*, 92–96
- Russell, A. W., & Schober, M. F. (1999). How beliefs about a partner's goals affect referring in goal-discrepant conversations. *Discourse Processes, 27*, 1-33.
- Salton, G., & Buckley, C. (1988). Term-weighting approaches in automatic text retrieval. *Information Processing & Management, 24*, 513-523.
- Sanderson, C. A., Keiter, E. J., Miles, M. G., & Yopyk, D. J. (2007). The association between intimacy goals and plans for initiating dating relationships. *Personal Relationships, 14*, 225-243.
- Santosh, K., Bansal, R., Shekhar, M., & Varma, V. (2013). Author profiling: Predicting age and gender from blogs? Notebook for PAN at CLEF 2013. In P. Forner, R. Navigli, & D. Tufis (Eds.), *CLEF 2013 Evaluation Labs and Workshop* (Vol. 1179, pp. 23–26).
- Schwartz, H.A., Eichstaedt, J.C., Kern, M.L., Dziurzynski L., Ramones, S.M., Agrawal, M., ... Ungar, L.H. (2013). Personality, gender, and age in the language of social media: The open-vocabulary approach. *PLoS ONE, 8*: e73791.
- Scott, G. G., & Hand, C. J. (2016). Motivation determines Facebook viewing strategy: an eye movement analysis. *Computers in Human Behavior, 56*, 267-280.
- Scott, G. G., Sinclair, J., Short, E., & Bruce, G. (2014). It's not what you say, it's how you say it: language use on Facebook impacts employability but not attractiveness. *Cyberpsychology, Behavior, and Social Networking, 17*, 562-566.
- Seidman, G., & Miller, O. S. (2013). Effects of gender and physical attractiveness on visual attention to Facebook profiles. *Cyberpsychology, Behavior, and Social Networking, 16*, 20-24.
- Sharabi, L. L. (2021). Online dating profiles, first-date interactions, and the enhancement of communication satisfaction and desires for future interaction. *Communication Monographs, 88*, 131-153.

- Sharabi, L. L., & Dykstra-DeVette, T. A. (2019). From first email to first date: Strategies for initiating relationships in online dating. *Journal of Social and Personal Relationships*, *36*, 3389-3407.
- Simms, L. J., Yufik, T., Thomas, J. P., & Simms, E. N. (2008). Exploring the nature of evaluative person descriptors through scale development. *Journal of Research in Personality*, *42*, 1271-1284.
- Simonton, D. K. (1986). Popularity, content, and context in 37 Shakespeare plays. *Poetics*, *15*, 493-510.
- Simonton, D. K. (1989). Shakespeare's Sonnets: a case of and for single-case historiometry. *Journal of Personality*, *57*, 695-721.
- Simonton, D. K. (2009). The literary genius of William Shakespeare: Empirical studies of his dramatic and poetic creativity. In S. B. Kaufman & J. C. Kaufman (Eds.), *The Psychology of Creative Writing* (pp. 131-145). Cambridge, UK: Cambridge University Press.
- Slatcher, R. B., Vazire, S., & Pennebaker, J. W. (2008). Am "I" more important than "we"? Couples' word use in instant messages. *Personal Relationships*, *15*, 407-424.
- Sritharan, R., Heilpern, K., Wilbur, C. J., & Gawronski, B. (2010). I think I like you: Spontaneous and deliberate evaluations of potential romantic partners in an online dating context. *European Journal of Social Psychology*, *40*, 1062-1077.
- Stephure, R. J., Boon, S. D., MacKinnon, S. L., & Deveau, V. L. (2009). Internet initiated relationships: Associations between age and involvement in online dating. *Journal of Computer-Mediated Communication*, *14*, 658-681.
- Sternberg, R. J. (1985). Implicit theories of intelligence, creativity, and wisdom. *Journal of Personality and Social Psychology*, *49*, 607-627.
- Sternberg, R. J. (1988). A three-facet model of creativity. In R. J. Sternberg (Ed.), *The Nature of Creativity: Contemporary Psychological Perspectives* (pp. 125-147). Cambridge, UK: CUP Archive.
- Sternberg, R. J. (1986). A triangular theory of love. *Psychological Review*, *93*, 119-135.
- Sternberg, R. J., & Lubart, T. I. (1999). The concept of creativity: Prospects and paradigms. In R. Sternberg (Ed.), *Handbook of Creativity* (pp. 3-15). Cambridge, UK: Cambridge University Press.
- Stiff, C. (2012). Watch what you write: How errors in feedback influence consumer attitudes and behavior. *Journal of Internet Commerce*, *11*, 41-67.
- Stirman, S. W., & Pennebaker, J. W. (2001). Word use in the poetry of suicidal and nonsuicidal poets. *Psychosomatic Medicine*, *63*, 517-522.
- Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. *Journal of Language and Social Psychology*, *29*, 24-54.
- Tay, Y., Tuan, L. A., & Hui, S. C. (2018). CoupleNet: Paying Attention to Couples with Coupled Attention for Relationship Recommendation. In *Proceedings of the 12th International AAAI Conference on Web and Social Media* (pp. 415-424).

References

- Tidwell, L. C., & Walther, J. B. (2002). Computer-mediated communication effects on disclosure, impressions, and interpersonal evaluations: Getting to know one another a bit at a time. *Human Communication Research, 28*, 317-348.
- Toma, C. L. (2014). Towards conceptual convergence: An examination of interpersonal adaptation. *Communication Quarterly, 62*, 155-178.
- Toma, C. L., & D'Angelo, J. D. (2015). Tell-tale words: Linguistic cues used to infer the expertise of online medical advice. *Journal of Language and Social Psychology, 34*, 25-45.
- Toma, C. L. & D'Angelo, J. D. (2017). Connecting profile-to-profile: How people self-present and form impressions of others through online dating profiles. In N. M. Punyanunt-Carter & J. S. Wrench (Eds.), *The Impact of Social Media in Modern Romantic Relationships* (pp. 147-162). Lanham, MD: Lexington.
- Toma, C. L., & Hancock, J. T. (2010). Looks and lies: The role of physical attractiveness in online dating self-presentation and deception. *Communication Research, 37*, 335-351.
- Toma, C. L., & Hancock, J. T. (2011). A New Twist on Love's Labor: Self-Presentation in Online Dating Profiles. In K. B. Wright & L. M. Webb (Eds.), *Computer-Mediated Communication in Personal Relationships* (pp. 41-55). New York, NY: Peter Lang.
- Toma, C. L., & Hancock, J. T. (2012). What lies beneath: The linguistic traces of deception in online dating profiles. *Journal of Communication, 62*, 78-97.
- Tong, S. T., Corriero, E. F., Wibowo, K. A., Makki, T. W., & Slatcher, R. B. (2020). Self-presentation and impressions of personality through text-based online dating profiles: A lens model analysis. *New Media & Society, 22*, 875-895.
- Utz, S. (2010). Show me your friends and I will tell you what type of person you are: How one's profile, number of friends, and type of friends influence impression formation on social network sites. *Journal of Computer-Mediated Communication, 15*, 314-335.
- Valuch, C., Pflüger, L. S., Wallner, B., Laeng, B., & Ansorge, U. (2015). Using eye tracking to test for individual differences in attention to attractive faces. *Frontiers in Psychology, 6*: 42.
- Van Berlo, Z., & Ranzini, G. (2018). Big Dating: A Computational Approach to Examine Gendered Self-Presentation on Tinder. In *Proceedings of the 9th International Conference on Social Media and Society* (pp. 390-394).
- Van den Bosch, A., Busser, G.J., Daelemans, W., & Canisius, S. (2007). An efficient memory based morphosyntactic tagger and parser for Dutch, In F. van Eynde, P. Dirix, I. Schuurman, & V. Vandeghinste (Eds.), *Selected Papers of the 17th Computational Linguistics in the Netherlands Meeting* (pp. 99-114).

- Van der Heide, B., D'Angelo, J. D., & Schumaker, E. M. (2012). The effects of verbal versus photographic self-presentation on impression formation in Facebook. *Journal of Communication, 62*, 98-116.
- Van der Lee, C., & Van den Bosch, A. (2017). Exploring lexical and syntactic features for language variety identification. In *Proceedings of the 4th Workshop on NLP for Similar Languages, Varieties and Dialects* (pp. 190-199). Stroudsburg, PA: ACL Anthology.
- Van der Lee, C., Van der Zanden, T., Kraemer, E., Mos, M., & Schouten, A. (2019, November). Automatic identification of writers' intentions: Comparing different methods for predicting relationship goals in online dating profile texts. In *Proceedings of the 5th Workshop on Noisy User-generated Text* (pp. 94-100).
- Van der Zanden, T., Mos, M., & Schouten, A.P. (2018). Taalaccommodatie in online datingprofielen: Effecten van opleidingsniveau en type datingsite op taalgebruik [Language accommodation in online dating profiles: Effects of level of education and type of dating site on language use]. *Tijdschrift voor Taalbeheersing, 40*, 83-106.
- Van Straaten, I., Holland, R. W., Finkenauer, C., Hollenstein, T., & Engels, R. C. (2010). Gazing behavior during mixed-sex interactions: Sex and attractiveness effects. *Archives of Sexual Behavior, 39*, 1055-1062.
- Van Wissen, L., & Boot, P. (2017). An Electronic Translation of the LIWC Dictionary into Dutch. In *Electronic Lexicography in the 21st Century: Proceedings of eLex 2017 Conference* (pp. 703-715).
- Vignovic, J. A., & Thompson, L. F. (2010). Computer-mediated cross-cultural collaboration: Attributing communication errors to the person versus the situation. *Journal of Applied Psychology, 95*, 265-276.
- Wada, M., Clarke, L. H., & Mortenson, W. B. (2019). 'I am busy independent woman who has sense of humor, caring about others': older adults' self-representations in online dating profiles. *Ageing & Society, 39*, 951-976.
- Wallace, I., Wallace, A., Wallechinsky, D., & Wallace, S. (2008). *The Intimate Sex Lives of Famous People*. Port Townsend, WA: Feral House.
- Walster, E., Aronson, V., Abrahams, D., & Rottman, L. (1966). Importance of physical attractiveness in dating behavior. *Journal of Personality and Social Psychology, 4*, 508-516.
- Walster, E., Berscheid, E., & Walster, G. W. (1973). New directions in equity research. *Journal of Personality and Social Psychology, 25*, 151-176.
- Walther, J. B. (1992). Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research, 19*, 52-90.

References

- Walther, J. B. (2007). Selective self-presentation in computer-mediated communication: Hyperpersonal dimensions of technology, language, and cognition. *Computers in Human Behavior, 23*, 2538-2557.
- Walther, J. B., & D'Addario, K. P. (2001). The impacts of emoticons on message interpretation in computer-mediated communication. *Social Science Computer Review, 19*, 323-345.
- Walther, J. B., & Parks, M. R. (2002). Cues filtered out, cues filtered in; computer mediated communication and relationships. In M. L. Knapp & J. A. Daly (Eds.), *Handbook of Interpersonal Communication* (3rd ed., pp. 529-561). Thousand Oaks, CA: Sage.
- Walther, J. B., Van Der Heide, B., Hamel, L., & Shulman, H. (2009). Self-generated versus other generated statements and impressions in computer-mediated communication: A test of warranting theory using Facebook. *Communication Research, 36*, 229-253.
- Wang, S. S., Moon, S.-I., Kwon, K. H., Evans, C. A., & Stefanone, M. A. (2010). Face off: Implications of visual cues on initiating friendship in Facebook. *Computers in Human Behavior, 26*, 226-234.
- Watkins, C. D. (2017). Creating beauty: creativity compensates for low physical attractiveness when individuals assess the attractiveness of social and romantic partners. *Royal Society Open Science, 4*: 160955.
- Weeks, D. J., & Ward, K. (1999). Eccentricity. In M. A. Runco & S. Pritzker (Eds.), *Encyclopedia of Creativity* (pp. 613-621). San Diego, CA: Academic Press.
- Weidman, A. C., Cheng, J. T., Chisholm, C., & Tracy, J. L. (2015). Is she the one? Personality judgments from online personal advertisements. *Personal Relationships, 22*, 591-603.
- West, W. C., & Holcomb, P. J. (2000). Imaginal, semantic, and surface-level processing of concrete and abstract words: an electrophysiological investigation. *Journal of Cognitive Neuroscience, 12*, 1024-1037.
- White, J., Lorenz, H., Perilloux, C., & Lee, A. (2018). Creative casanovas: mating strategy predicts using – but not preferring – atypical flirting tactics. *Evolutionary Psychological Science, 4*, 443-455.
- Whitty, M.T. (2008). Revealing the 'real' me, searching for the 'actual' you: Presentations of self on an internet dating site. *Computers in Human Behavior, 24*, 1707-1723.
- Wilbur, C. J., & Campbell, L. (2011). Humor in romantic contexts: Do men participate and women evaluate? *Personality and Social Psychology Bulletin, 37*, 918-929.
- Willis, J., & Todorov, A. (2006). First impressions: Making up your mind after a 100-ms exposure to a face. *Psychological Science, 17*, 592-598.
- Wobcke, W., Krzywicki, A., Kim, Y. S., Cai, X., Bain, M., Compton, P., & Mahidadia, A. (2015). A deployed people-to-people recommender system in online dating. *AI Magazine, 36*, 5-18.

- Wotipka, C. D., & High, A. C. (2016). An idealized self or the real me? Predicting attraction to online dating profiles using selective self-presentation and warranting. *Communication Monographs*, 83, 281-302.
- Yarkoni, T. (2010). Personality in 100,000 words: A large-scale analysis of personality and word use among bloggers. *Journal of Research in Personality*, 44, 363-373.
- Zibarras, L. D., Port, R. L., & Woods, S. A. (2008). Innovation and the 'Dark Side' of Personality: Dysfunctional Traits and their Relation to Self-Reported Innovative Characteristics. *The Journal of Creative Behavior*, 42, 201-215.

Acknowledgements

In januari 2016 maakte ik tijdens de LOT Winter School voor het eerst kennis met onze mooie en groene campus. Om eerlijk te zijn wist ik tot kort daarvoor niet eens dat in Tilburg ook een universiteit was (oeps). Maar de sfeer was enorm goed en toen er een paar maanden later een vacature voor een promotieproject voorbij kwam – over écht een leuk onderwerp – wilde ik direct solliciteren. Dat ik mijn master nog niet helemaal af had leek mij geen al te groot probleem. Mijn masterscriptie was tenslotte bijna af, althans dat dacht ik toen. Ondanks dat dit zeker niet de laatste keer was dat mijn tijdsinschatting niet helemaal realistisch bleek te zijn, is het toch gelukt netjes op tijd een boekje af te leveren. En daar moet ik heel veel mensen voor bedanken.

First of all, I would like to thank my highly esteemed committee members Marjolijn Antheunis, Enny Das, Nicole Ellison, Henk Pander Maat and Laura Vandenbosch. I'm extremely proud that such excellent researchers agreed on assessing my dissertation and I sincerely hope that reading the manuscript was as enjoyable as writing it. I am really looking forward to follow your research and meet you (in person) at future conferences.

Ook wil ik graag Femke van der Hoeven van Parship en John Meuffels van 50PlusMatch bedanken voor de fijne samenwerkingen. Jullie enthousiasme en bereidwilligheid om onze onderzoeken te verspreiden onder jullie leden heeft mijn proefschrift een enorme boost gegeven. Hopelijk zijn onze onderzoeksresultaten ook voor jullie en jullie leden van waarde geweest. Ik kijk ernaar uit in de toekomst meer te horen over jullie inzichten uit de praktijk.

Alex, Maria en Emiel, ik heb mij zo vaak gelukkig geprezen met jullie als mijn begeleiders. Echt heel vaak. Het is zó leuk, zó gezellig en zo ontzettend leerzaam geweest. Wekelijks keek ik uit naar onze afspraken, waarbij Emiel altijd voor aanvang nog even snel koffie moest halen, altijd minstens één (Amsterdams) politiek onderwerp aan bod kwam waarover ik geen kennis en/of mening had, en Alex ten minste één foute grap maakte. Kortom: ik had mij geen betere begeleiders kunnen wensen. Het plezier dat ik de afgelopen jaren aan mijn werk beleefde komt echt voor een groot deel door jullie.

Alex, ondanks dat jouw credo “dit kun je korter schrijven” inderdaad bijna altijd resulteerde in een beter paper, wil ik hier toch wat meer woorden gebruiken om mijn waardering voor je uit te spreken. De afgelopen jaren hebben we veel samengewerkt, niet alleen voor mijn project maar ook begeleidde we scripties samen en nam je mij onder je hoede als BDM-trackcoördinator. Je hebt mij altijd enorm op m'n gemak laten voelen, en daarvoor wil ik je bedanken. Dat is echt een hele goede en fijne eigenschap waar ik heel veel aan heb gehad. Heel erg bedankt voor alle gezellige borrels en wijze woorden en ik hoop dat ik ook in de toekomst nog meer van je zal leren. Een van de dingen die ik nu al van je heb geleerd is dat ik nooit meer van mijn impostor syndrome af ga komen, want als zelfs geweldig goede onderzoekers als jij er nog last van hebben dan is mijn lot bepaald.

In de academische wereld waar we altijd meer en meer willen is het ontzettend fijn dat er iemand is die je stil laat staan bij wat er wel al is bereikt en schouderklopjes uitdeelt. We hebben

Acknowledgements

allemaal iemand om ons heen nodig die goed complimentjes kan geven, en zo iemand ben jij, Maria. Je hebt mij veel vertrouwen gegeven de afgelopen jaren, en dat had ik best af en toe wel nodig. Je bent van het begin tot het eind van het project enorm betrokken geweest. Dank hiervoor! (het woord “dank” gebruik ik nu ook veel door jou). Altijd bood je aan, ergens tussen de bedrijven door, mijn teksten nog even door te nemen, waar ik me regelmatig voor schaamde en/of opgelaten over voelde. Maar waar ik ook natuurlijk ontzettend blij mee was. En ik denk dat je het zelf stiekem ook hartstikke leuk vond om met een vergrootglas naar mijn teksten te kijken, en nog net wat formuleringen te “tweaken”. Heel veel dank voor alles wat je voor me hebt gedaan en wat ik van je heb geleerd. Het enige mindere punt dat ik kan bedenken is die ene club.

Natuurlijk wil ik jou, Emiel, enorm bedanken voor alle kennis die jij mij tijdens het project hebt bijgebracht over het uitdenken en uitvoeren van gedegen onderzoek. Wanneer jij aansloot bij onze afspraken was er altijd een lijstje “benieuwd wat Emiel hiervan vindt”, waarna we alle knopen konden doorhakken. Maar daarnaast ben ik je ook ontzettend dankbaar voor de oprechte interesse die je de afgelopen jaren hebt getoond. Natuurlijk had je interesse naar de voortgang van mijn onderzoek, maar vooral ook naar hoe mijn vakantie was geweest, of de verhuizing goed was gegaan en of ik nog boeken had gelezen die ik zou aanraden. Mijn laatstgelezen boek is trouwens ‘Language Use and Impression Formation’ – aanrader wel.

En dan mijn geweldige paranimfen Annemarie en Ruben. Mijn beeld van wat paranimfen precies doen is nog steeds niet helemaal helder, maar vanaf dat jullie ons na de zomer van 2017 in D407 kwamen vergezellen, wist ik wel zeker dat ik jullie zou vragen. Het was gelijk veel lachen, kletsen, lachen, ouwehoeren, met af en toe wat werken (niet gek dat Ruben op een gegeven moment naar de derde vertrok). Het hoogtepunt van ons driemusketerschap was wel Washington, waar we met z’n drietjes voor het minder fancy hotel gingen, maar waar we in ieder geval zeker wisten dat we dagelijks twee work-outs van en naar de conferentielocatie zouden hebben en we muffins als ontbijt kregen. Natuurlijk had Ruben dit tot in de puntjes uitgezocht en geregeld, en hoefden wij vooral zijn Tikkies af te tikken. Ruben, ik moet hardop lachen als ik terugdenk aan al je woordgrappen, memes, Nespresso-evaluaties, spelletjesreviews, en ga zo maar door. Ik hoop dat we nog veel jaren vrienden en collega’s zullen blijven! Annemarie, we zijn de afgelopen jaren haast niet van elkaars zijde geweest. Ik bewonder je rust, begrip, betrokkenheid en zekerheid. Als flapuit kan ik nog enorm leren van jouw bedachtzaamheid en eerst-denken-dan-zeggen-aanpak. Hopelijk kunnen we de aankomende jaren echt tijd gaan doorbrengen in ons nieuwe kantoor (ik weet nog niet eens het kantoornummer uit mijn hoofd?), en gaat die conferentie naar Australië nog plaatsvinden. Want o wat waren Philadelphia en New York met Debby geweldig hè? Ik droom nog regelmatig van die french-toast-caloriebom uit Philadelphia, de flikkerende lichtjes op Times Square, en de spannende laatste innings van de Red Sox tegen de Yankees (die Debby en Wouter misten om op tijd in hun

ghetto terug te zijn). Rubicon en AnnMary, ik kan niet wachten tot jullie promoties. Ik ben nu al ontzettend trots!

Maar ook alle andere (ex-) PhD'ers hebben mijn leven zoveel meer kleur gegeven. Jullie zijn de reden dat ik meerdere keren per week met zin de vroege trein pakte. En vooral ook de afgelopen 1,5 jaar waarin we dag en nacht thuis zaten, had ik niet overleefd zonder alle berichten en grappen op onze app. Debby, jij was een van de eerste van de afdeling die ik ontmoette in de zomer voor ik in Tilburg begon, en jouw enthousiasme zorgde ervoor dat ik nog meer zin kreeg om te beginnen. Deze positieve eerste indruk bleek gegrond en het begin te zijn van een vriendschap vol hilarische momenten: carnavallen in Breda, spinnen opzuigen in de Woudrichemse nacht, zoemende blikjesautomaten in Philadelphia, biertjes in het Schijndelse zwembad, en zoveel meer wat ik nu vergeet. Wat mij betreft gaan we hier nog heel veel mooie momenten aan toevoegen, want het is gewoon geweldig, echt geweldig met jou Deb! Saar de sfeermaker, vanaf de dag dat je binnenkwam was het *fun times*. En dat natuurlijk het liefst met een biertje erbij. Of twee. Of meer. Dat we nog maar vaak zullen proosten de aankomende jaren! En bedankt nog voor het logeren, gelukkig hield Zlatan een oogje in het zeil. Emmelyn, ik ben ontzettend blij dat ik je de afgelopen jaren steeds beter heb leren kennen. Als je samen een zomerseminar in Amsterdam hebt bijgewoond, op Lowlands hebt gestaan (terwijl jij hartstikke zwanger was), en net voor sluitingstijd bij de McDonalds bent geweest omdat de snacks van de Nan Yang-borrel toch wat tegenvielen, kun je zeggen dat de basis goed is. In het begin was je wel een beetje mijn voorbeeld – je was tenslotte al bijna klaar om te promoveren – en eigenlijk ben je dat nog steeds wel. Je fijne manier van presenteren in perfect Engels, je vragen na een praatje, en je onophoudelijke vriendelijkheid staan allemaal nog op mijn to-learn-lijstje. Chris, jou heb ik misschien nog wel het meest met vragen en appjes bestookt, die variërend gingen over scripts (meestal), statistiek (best vaak), en woordkeuzes (regelmatig), maar ook over Feyenoord, MAFS, Temptation Island, en al het andere achterklapnieuws. Sorry nog daarvoor! Ik sta nog ontzettend veel jaar bij jou in het krijt, dus ik hoor het graag wanneer ik eens iets voor jou kan betekenen. Ik hoop op nog meer samenwerkingen in de toekomst want je bent echt een geweldige collega! Jan, als ik aan jou denk, zie ik een stuiterbal vol energie voor me. Een stuiterbal met wie ik in de Mensa vaak nog meer koffie ging halen. Ik dacht dat ik veel praatte, maar naast jou val ik in het niet. Jouw open-, eerlijk- en (Brabanste) gezelligheid is goud waard. Dank daarvoor en ook voor al je hulp! Yan, I'm so grateful for being your roommate for such a long time. I think the last couple of years we've learned a lot from each other and each other's cultures. "Interesting" is the word that I'll always link to you, as this was the word you often mentioned when we discussed whatever topic. Thanks also for all the wonderful dishes you prepared for us, and the interesting green mooncakes you brought to the office. I'm really looking forward to your defence in the near future! Ook de andere mensen uit de fijne PhD groep wil ik enorm bedanken: Marie (D407 rules!), Kim, Naal, Marlies (dank

Acknowledgements

voor je hulp bij mijn Engelse kwesties), Naun (was fun to organize PhD meetings together), Marieke, Charlotte, Liesje, Julie, en iedereen die ik nu vergeten ben. Het was een absolute toptijd door jullie!

Ik besef maar al te goed hoeveel geluk ik heb gehad dat ik in deze groep terecht ben gekomen, want ik heb het nu nog niet eens gehad over alle andere lieve, slimme, leuke, grappige en gezellige collega's. Stuk voor stuk hardwerkende en bewonderingswaardige onderzoekers en docenten, maar vooral ook leuke collega's die altijd in zijn voor kletspraatjes, grappen, spelletjes, pubquizzes, en dansavondjes. De allergelukkigste momenten beleefde ik misschien niet eens met jullie op de werkvloer maar wel op de dansvloer, in Malle, op Etmaal, op Lowlands, en in Washington. In het bijzonder wil ik Loes nog bedanken voor haar vrolijkheid en gastvrijheid (wanneer mag ik weer komen logeren?), Ruud en Jan voor de gezellige treinreizen waarin we vaak het laatste voetbalnieuws bespraken (dit vond ik zelf het allerleukst in 2016-2017), Joost S. voor onze leuke en (voor mij) leerzame samenwerking en je onwaarschijnlijke gevoel voor humor, Jos voor de lange autotripjes die nooit saai werden door je spraakwatervallen en ongepolijste meningen, Per voor de tennislessen, de Fitbit-wedstrijdjes en het op sleeptouw nemen van mij als je 'buddy', en natuurlijk Lauraine voor al haar betrokkenheid; ik ken maar weinig mensen die zo attent zijn als jij (het is nu officieel tijd voor de *revival* van de verjaardags-ecard!). Ik ben een gelukkig mens met jullie als collega's!

Natuurlijk ook heel veel liefs voor al mijn geweldige vriendinnen uit Delft, Leiden en omstreken: de vele wandelingen, taartjes, lunches, koffietjes, boekentips, borrels, etentjes, feestjes, spelletjesavonden, weekendjes, en vakanties zorgden ervoor dat ik altijd met plezier mijn werk aan de kant schoof. Bedankt ook voor alle interessevragen die jullie bleven stellen en jullie eeuwige loyaliteit wanneer ik jullie weer vroeg de aantrekkelijkheid van foto's te beoordelen.

Mijn lieve familie kan natuurlijk ook niet in dit lijsje ontbreken. Mam en pap, als ik vertelde dat ik ergens mocht presenteren op een conferentie kwam vaak als eerst de vraag "en moet dat dan allemaal in het Engels?". Het antwoord is ja, maar je kunt nu gewoon doorbladeren naar de Nederlandse samenvatting om in 5 bladzijden te lezen wat ik de afgelopen 4.5 jaar zoal heb uitgespookt. Pap, nu heb ik ook een boekje geschreven! Ik verzoek je wel vijf sterren te geven op Goodreads, en een goede review achter te laten. Mam, zo veel dank voor al je goede zorgen en (soms ongevroegde) adviezen. Onlangs was je nogal verbaasd toen pap en ik vertelden dat we ook altijd het dankwoord van boeken lezen. Toch hoop ik dat jij dat nu ook doet zodat je kunt lezen hoe ontzettend gelukkig ik ben met jullie als mijn ouders. Roos en Tom, heel erg bedankt voor het beantwoorden van al mijn hulpeloze vragen over layouts, designen, photoshoppen, en alle andere praktische en creatieve zaken waar ik nul affiniteit mee heb en waar ik er altijd op vertrouwde dat mijn grote zus het wel wist. En nu jij de cover van dit proefschrift hebt gemaakt (of: project "cover design" hebt geleid) en ik de tekst heb geschreven, komt onze kinderdroom uit: een boek met tekst van Tess van der Zanden en illustraties van Roos van der Zanden. Lieve Roos, doordat jij me altijd "slimmerikje"

noemde bij een academisch succesje, ging ik dat haast zelf geloven. Mammie, wat hebben wij ontzettend veel fijne en leuke herinneringen samen. Natuurlijk die in Vence en Les Menuires maar ook in Luxemburg en Delft. Ik ben hartstikke trots dat je nog gewoon bij mijn promotie kan zijn! Ron en Janneke, ik heb mij vanaf dag één bij jullie op mijn gemak gevoeld en ik wil jullie bedanken voor alles wat jullie voor mij hebben gedaan de afgelopen 8 jaar. Ik hoop nog heel veel gezellige jaren bij jullie over de vloer te komen. En dan natuurlijk Marc. Het is waarschijnlijk de bedoeling hier iets zoetzappigs te schrijven. Maar dat is precies iets waar wij allebei niet zo goed in zijn. Toch is dit mijn kans om hier zwart op wit te zetten hoe dol ik op je ben: op je alles-of-niets instelling, je onuitputtelijke enthousiasme (het maakt niet uit waarover), je onvoorwaardelijke steun en liefde, en nog zo veel meer. Het blijkt dat je ook offline “de soulmate” (iel) kan vinden die iedereen in de onlinedatingwereld lijkt te zoeken.

Jullie zijn allemaal altijd hartstikke trots op mij geweest, maar ik ben nog heel veel trotser op jullie! Ik heb geen woorden voor hoe dankbaar ik jullie ben. Ook ik ben weleens stil.

Tess

Publication List

Journal Publications

- Van der Zanden, T., Mos, M., Schouten, A.P., & Krahmer, E. (2021). What People Look at in Multimodal Online Dating Profiles: How Pictorial and Textual Cues Affect Impression Formation. *Communication Research*. Advance online publication.
- Van der Zanden, T., Schouten, A.P., Mos, M., & Krahmer, E. (2020). Impression Formation on Online Dating Sites: Effects of Language Errors in Profile Texts on Perceptions of Profile Owners' Attractiveness. *Journal of Social and Personal Relationships*, 37, 758-778.
- Van der Zanden, T., Schouten, A.P., Mos, M., van der Lee, C., & Krahmer, E. (2019). Effects of Relationship Goal on Linguistic Behavior in Online Dating Profiles: A Multi-Method Approach. *Frontiers in Communication*, 4:22.
- Van der Zanden, T., Mos, M., & Schouten, A.P. (2018). Taalaccommodatie in online datingprofielen: Effecten van opleidingsniveau en type datingsite op taalgebruik. *Tijdschrift voor Taalbeheersing*, 40, 83-106.

Working Papers

- Van der Zanden, T., Mos, M., Schouten, A.P. & Krahmer, E. (2021). Originality in OnlineDating Profile Texts: How Does Perceived Originality Affect Impression Formation and What Makes a Text Original? *Submitted for publication*. Preregistration, materials, and data available via the Open Science Framework, at osf.io/yms83/.

Papers in Conference Proceedings (peer reviewed)

- Van der Lee, C., Van der Zanden, T., Krahmer, E., Mos, M., & Schouten, A.P. (2019). Automatic identification of writers' intentions: Comparing different methods for predicting relationship goals in online dating profile texts. In *Proceedings of the 5th Workshop on Noisy User-generated Text* (pp. 94-100).
- Van der Zanden, T., van der Lee, C., Schouten, A.P., Mos, M., & Krahmer, E. (2018). Effects of Relationship Goals on Linguistic Behavior in Online Dating Profiles: A Classifier Approach. In R. Vandekerckhove, D. Fiser, & L. Hilte (Eds.), *Proceedings of the 6th Conference on Computer-Mediated Communication (CMC) and Social Media Corpora* (pp. 58-62).

Papers of Conference Presentations (peer reviewed)

- Van der Zanden, T., Mos, M., Schouten, A.P. & Kraahmer, E. (2021). *Originality in Online Dating Profile Texts: How Does Originality Affect Impression Formation and What Makes a Text Original?* Paper presented at The 71th Annual Conference of the International Communication Association (ICA). Denver, USA.
- Van der Zanden, T., Mos, M., Schouten, A.P., & Kraahmer, E. (2020). *What People Look at in Multimodal Online Dating Profiles: How Pictorial and Textual Cues Affect Impression Formation.* Paper presented at The 70th Annual Conference of the International Communication Association (ICA). Gold Coast, Australia.
- Van der Zanden, T., Schouten, A.P., Mos, M., & Kraahmer, E. (2019). *Impression Formation on Online Dating Sites: Effects of Language Errors in Profile Texts on Perceptions of Profile Owners' Attractiveness.* Paper presented at The 69th Annual Conference of the International Communication Association (ICA). Washington DC, USA.
- Van der Zanden, T., Schouten, A.P., Mos, M., van der Lee, C., & Kraahmer, E. (2019). *Effects of Relationship Goal on Linguistic Behavior in Online Dating Profiles: A Multi-Method Approach.* Paper presented at The 69th Annual Conference of the International Communication Association (ICA). Washington DC, USA.

Abstracts of Conference Presentations (peer reviewed)

- Van der Zanden, T., Mos, M., Schouten, A.P. & Kraahmer, E. (2021). *Originality in Online Dating Profile Texts: How Does Originality Affect Impression Formation and What Makes a Text Original?* Paper presented at the Etmaal van de Communicatiewetenschap, Brussels, Belgium.
- Van der Zanden, T., Mos, M., Schouten, A.P., & Kraahmer, E. (2020). *What People Look at in Multimodal Online Dating Profiles: How Pictorial and Textual Cues Affect Impression Formation.* Paper presented at the Etmaal van de Communicatiewetenschap, Amsterdam, the Netherlands.
- Van der Zanden, T., Schouten, A.P., Mos, M., & Kraahmer, E. (2019). *Impression Formation on Online Dating Sites: The Effects of Language Errors in Profile Texts on Perceptions of Profile Owners' Attractiveness.* Paper presented at the Etmaal van de Communicatiewetenschap, Nijmegen, the Netherlands.
- Van der Zanden, T., Schouten, A.P., Mos, M., & Kraahmer, E. (2019). *Impression Formation on Online Dating Sites: The Effects of Language Errors in Profile Texts on Perceptions of Profile Owners' Attractiveness.* Poster presented at TABU Dag, Groningen, the Netherlands.

Van der Zanden, T., Mos, M., & Schouten, A.P. (2018). *Taalaccommodatie in online datingprofielen: Effecten van opleidingsniveau en type datingsite op taalgebruik [Language Accommodation in Online Dating Profiles: Effects of Education Level and Type of Dating Site on Language Use]*. Paper presented at the Etmaal van de Communicatiewetenschap, Ghent, Belgium

TiCC Ph.D. Series

1. Pashiera Barkhuysen. Audiovisual Prosody in Interaction. Promotores: M.G.J. Swerts, E.J. Krahmer. Tilburg, 3 October 2008.
2. Ben Torben-Nielsen. Dendritic Morphology: Function Shapes Structure. Promotores: H.J. van den Herik, E.O. Postma. Co-promotor: K.P. Tuyls. Tilburg, 3 December 2008.
3. Hans Stol. A Framework for Evidence-based Policy Making Using IT. Promotor: H.J. van den Herik. Tilburg, 21 January 2009.
4. Jeroen Geertzen. Dialogue Act Recognition and Prediction. Promotor: H. Bunt. Co-promotor: J.M.B. Terken. Tilburg, 11 February 2009.
5. Sander Canisius. Structured Prediction for Natural Language Processing. Promotores: A.P.J. van den Bosch, W. Daelemans. Tilburg, 13 February 2009.
6. Fritz Reul. New Architectures in Computer Chess. Promotor: H.J. van den Herik. Co-promotor: J.W.H.M. Uiterwijk. Tilburg, 17 June 2009.
7. Laurens van der Maaten. Feature Extraction from Visual Data. Promotores: E.O. Postma, H.J. van den Herik. Co-promotor: A.G. Lange. Tilburg, 23 June 2009 (cum laude).
8. Stephan Raaijmakers. Multinomial Language Learning. Promotores: W. Daelemans, A.P.J. van den Bosch. Tilburg, 1 December 2009.
9. Igor Berezhnoy. Digital Analysis of Paintings. Promotores: E.O. Postma, H.J. van den Herik. Tilburg, 7 December 2009.
10. Toine Bogers. Recommender Systems for Social Bookmarking. Promotor: A.P.J. van den Bosch. Tilburg, 8 December 2009.
11. Sander Bakkes. Rapid Adaptation of Video Game AI. Promotor: H.J. van den Herik. Co-promotor: P. Spronck. Tilburg, 3 March 2010.
12. Maria Mos. Complex Lexical Items. Promotor: A.P.J. van den Bosch. Co-promotores: A. Vermeer, A. Backus. Tilburg, 12 May 2010 (in collaboration with the Department of Language and Culture Studies).
13. Marieke van Erp. Accessing Natural History. Discoveries in data cleaning, structuring, and retrieval. Promotor: A.P.J. van den Bosch. Co-promotor: P.K. Lendvai. Tilburg, 30 June 2010.
14. Edwin Commandeur. Implicit Causality and Implicit Consequentiality in Language Comprehension. Promotores: L.G.M. Noordman, W. Vonk. Co-promotor: R. Cozijn. Tilburg, 30 June 2010.
15. Bart Bogaert. Cloud Content Contention. Promotores: H.J. van den Herik, E.O. Postma. Tilburg, 30 March 2011.
16. Xiaoyu Mao. Airport under Control. Promotores: H.J. van den Herik, E.O. Postma. Co-promotores: N. Roos, A. Salden. Tilburg, 25 May 2011.
17. Olga Petukhova. Multidimensional Dialogue Modelling. Promotor: H. Bunt. Tilburg, 1 September 2011.
18. Lisette Mol. Language in the Hands. Promotores: E.J. Krahmer, A.A. Maes, M.G.J. Swerts. Tilburg, 7 November 2011 (cum laude).
19. Herman Stehouwer. Statistical Language Models for Alternative Sequence Selection. Promotores: A.P.J. van den Bosch, H.J. van den Herik. Co-promotor: M.M. van Zaanen. Tilburg, 7 December 2011.

20. Terry Kakeeto-Aelen. Relationship Marketing for SMEs in Uganda. Promotores: J. Chr. van Dalen, H.J. van den Herik. Co-promotor: B.A. Van de Walle. Tilburg, 1 February 2012.
21. Suleman Shahid. Fun & Face: Exploring Non-Verbal Expressions of Emotion during Playful Interactions. Promotores: E.J. Krahmer, M.G.J. Swerts. Tilburg, 25 May 2012.
22. Thijs Vis. Intelligence, Politie en Veiligheidsdienst: Verenigbare Grootheden? Promotores: T.A. de Roos, H.J. van den Herik, A.C.M. Spapens. Tilburg, 6 June 2012 (in collaboration with the Tilburg School of Law).
23. Nancy Pascall. Engendering Technology Empowering Women. Promotores: H.J. van den Herik, M. Diocaretz. Tilburg, 19 November 2012.
24. Agus Gunawan. Information Access for SMEs in Indonesia. Promotor: H.J. van den Herik. Co-promotores: M. Wahdan, B.A. Van de Walle. Tilburg, 19 December 2012.
25. Giel van Lankveld. Quantifying Individual Player Differences. Promotores: H.J. van den Herik, A.R. Arntz. Co-promotor: P. Spronck. Tilburg, 27 February 2013.
26. Sander Wubben. Text-to-text Generation Using Monolingual Machine Translation. Promotores: E.J. Krahmer, A.P.J. van den Bosch, H. Bunt. Tilburg, 5 June 2013.
27. Jeroen Janssens. Outlier Selection and One-Class Classification. Promotores: E.O. Postma, H.J. van den Herik. Tilburg, 11 June 2013.
28. Martijn Balsters. Expression and Perception of Emotions: The Case of Depression, Sadness and Fear. Promotores: E.J. Krahmer, M.G.J. Swerts, A.J.J.M. Vingerhoets. Tilburg, 25 June 2013.
29. Lianne van Weelden. Metaphor in Good Shape. Promotor: A.A. Maes. Co-promotor: J. Schilperoord. Tilburg, 28 June 2013.
30. Ruud Koolen. Need I say More? On Overspecification in Definite Reference. Promotores: E.J. Krahmer, M.G.J. Swerts. Tilburg, 20 September 2013.
31. J. Douglas Mastin. Exploring Infant Engagement. Language Socialization and Vocabulary Development: A Study of Rural and Urban Communities in Mozambique. Promotor: A.A. Maes. Co-promotor: P.A. Vogt. Tilburg, 11 October 2013.
32. Philip C. Jackson. Jr. Toward Human-Level Artificial Intelligence – Representation and Computation of Meaning in Natural Language. Promotores: H.C. Bunt, W.P.M. Daelemans. Tilburg, 22 April 2014.
33. Jorrig Vogels. Referential Choices in Language Production: The Role of Accessibility. Promotores: A.A. Maes, E.J. Krahmer. Tilburg, 23 April 2014 (cum laude).
34. Peter de Kock. Anticipating Criminal Behaviour. Promotores: H.J. van den Herik, J.C. Scholtes. Co-promotor: P. Spronck. Tilburg, 10 September 2014.
35. Constantijn Kaland. Prosodic Marking of Semantic Contrasts: Do Speakers Adapt to Addressees? Promotores: M.G.J. Swerts, E.J. Krahmer. Tilburg, 1 October 2014.
36. Jasmina Marić. Web Communities, Immigration and Social Capital. Promotor: H.J. van den Herik. Co-promotores: R. Cozijn, M. Spotti. Tilburg, 18 November 2014.
37. Pauline Meesters. Intelligent Blauw. Promotores: H.J. van den Herik, T.A. de Roos. Tilburg, 1 December 2014.

38. Mandy Visser. Better Use Your Head. How People Learn to Signal Emotions in Social Contexts. Promotores: M.G.J. Swerts, E.J. Krahmer. Tilburg, 10 June 2015.
39. Sterling Hutchinson. How Symbolic and Embodied Representations Work in Concert. Promotores: M.M. Louwerse, E.O. Postma. Tilburg, 30 June 2015.
40. Marieke Hoetjes. Talking hands. Reference in Speech, Gesture and Sign. Promotores: E.J. Krahmer, M.G.J. Swerts. Tilburg, 7 October 2015
41. Elisabeth Lubinga. Stop HIV. Start Talking? The Effects of Rhetorical Figures in Health Messages on Conversations among South African Adolescents. Promotores: A.A. Maes, C.J.M. Jansen. Tilburg, 16 October 2015.
42. Janet Bagorogoza. Knowledge Management and High Performance. The Uganda Financial Institutions Models for HPO. Promotores: H.J. van den Herik, B.A. van de Walle. Tilburg, 24 November 2015.
43. Hans Westerbeek. Visual realism: Exploring Effects on Memory, Language Production, Comprehension, and Preference. Promotores: A.A. Maes, M.G.J. Swerts. Co-promotor: M.A.A. van Amelsvoort. Tilburg, 10 February 2016.
44. Matje van de Camp. A link to the Past: Constructing Historical Social Networks from Unstructured Data. Promotores: A.P.J. van den Bosch, E.O. Postma. Tilburg, 2 March 2016.
45. Annemarie Quispel. Data for all: Data for all: How Professionals and Non-Professionals in Design Use and Evaluate Information Visualizations. Promotor: A.A. Maes. Co-promotor: J. Schilperoord. Tilburg, 15 June 2016.
46. Rick Tillman. Language Matters: The Influence of Language and Language Use on Cognition. Promotores: M.M. Louwerse, E.O. Postma. Tilburg, 30 June 2016.
47. Ruud Mattheij. The Eyes Have It. Promotores: E.O. Postma, H. J. Van den Herik, and P.H.M. Spronck. Tilburg, 5 October 2016.
48. Marten Pijl. Tracking of Human Motion over Time. Promotores: E. H. L. Aarts, M. M. Louwerse. Co-promotor: J. H. M. Korst. Tilburg, 14 December 2016.
49. Yevgen Matusevych. Learning Constructions from Bilingual Exposure: Computational Studies of Argument Structure Acquisition. Promotor: A.M. Backus. Co-promotor: A. Alishahi. Tilburg, 19 December 2016.
50. Karin van Nispen. What Can People with Aphasia Communicate with their Hands? A Study of Representation Techniques in Pantomime and Co-Speech Gesture. Promotor: E.J. Krahmer. Co-promotor: M. van de Sandt-Koenderman. Tilburg, 19 December 2016.
51. Adriana Baltaretu. Speaking of Landmarks. How Visual Information Influences Reference in Spatial Domains. Promotores: A.A. Maes and E.J. Krahmer. Tilburg, 22 December 2016.
52. Mohamed Abbadi. Casanova 2, a Domain Specific Language for General Game Development. Promotores: A.A. Maes, P.H.M. Spronck, A. Cortesi. Co-promotor: G. Maggiore. Tilburg, 10 March 2017.
53. Shoshannah Tekofsky. You Are Who You Play You Are. Modelling Player Traits from Video Game Behavior. Promotores: E.O. Postma, P.H.M. Spronck. Tilburg, 19 June 2017.

54. Adel Alhuraibi. From IT-BusinessStrategic Alignment to Performance: A Moderated Mediation Model of Social Innovation, and Enterprise Governance of IT. Promotores: H.J. van den Herik, B.A. van de Walle. Co-promotor: S. Ankolekar. Tilburg, 26 September 2017.
55. Wilma Latuny. The Power of Facial Expressions. Promotores: E.O. Postma, H.J. van den Herik. Tilburg, 29 September 2017.
56. Sylvia Huwaë. Different Cultures, Different Selves? Suppression of Emotions and Reactions to Transgressions across Cultures. Promotores: E.J. Krahmer, J. Schaafsma. Tilburg, 11 October 2017.
57. Mariana Serras Pereira. A Multimodal Approach to Children's Deceptive Behavior. Promotor: M. Swerts. Co-promotor: S. Shahid. Tilburg, 10 January 2018.
58. Emmelyn Croes. Meeting Face-to-Face Online: The Effects of Video-Mediated Communication on Relationship Formation. Promotores: E.J. Krahmer, M. Antheunis. Co-promotor: A.P. Schouten. Tilburg, 28 March 2018.
59. Lieke van Maastricht. Second language prosody: Intonation and rhythm in production and perception. Promotores: E.J. Krahmer, M.G.J. Swerts. Tilburg, 9 May 2018.
60. Nanne van Noord. Learning visual representations of style. Promotores: E.O. Postma, M. Louwerse. Tilburg, 16 May 2018.
61. Ingrid Masson Carro. Handmade: On the cognitive origins of gestural representations. Promotor: E.J. Krahmer. Co-promotor: M.B. Goudbeek. Tilburg, 25 June 2018.
62. Bart Joosten. Detecting social signals with spatiotemporal Gabor filters. Promotores: E.J. Krahmer, E.O. Postma. Tilburg, 29 June 2018
63. Yan Gu. Chinese hands of time: The effects of language and culture on temporal gestures and spatio-temporal reasoning. Promotor: M.G.J. Swerts. Co-promotores: M.W. Hoetjes, R. Cozijn. Tilburg, 5 June 2018.
64. Thiago Castro Ferreira. Advances in natural language generation: Generating varied outputs from semantic inputs. Promotor: E.J. Krahmer. Co-promotor: S. Wubben. Tilburg, 19 September 2018.
65. Yu Gu. Automatic emotion recognition from Mandarin speech. Promotores: E.O. Postma, H.J. van den Herik, H.X. Lin. Tilburg, 28 November 2018.
66. Francesco Di Giacomo. Metacasanova: A high-performance meta-compiler for domain-specific languages. Promotores: P.H.M. Spronck, A. Cortesi, E.O. Postma. Tilburg, 19 November 2018.
67. Ákos Kádár. Learning visually grounded and multilingual representations. Promotores: E.O. Postma. Co-promotor: A. Alishahi, G.A. Chrupala. Tilburg, 13 November 2019.
68. Phoebe Mui. The many faces of smiling: Social and cultural factors in the display and perception of smiles. Promotor: M.G.J. Swerts. Co-promotor: M.B. Goudbeek. Tilburg, 18 December 2019.
69. Véronique Verhagen. Illuminating variation: Individual differences in entrenchment of multi-word units. Promotor: A.M. Backus. Co-promotores: M.B.J. Mos, J. Schilperoord. Tilburg, 10 January 2020 (cum laude).

70. Debby Damen. Taking perspective in communication: Exploring what it takes to change perspectives. Promotor: E.J. Kraemer. Co-promotors: M.A.A. Van Amelsvoort, P.J. Van der Wijst. Tilburg, 4 November 2020.
71. Alain Hong. Women in the Lead: Gender, Leadership Emergence, and Negotiation Behavior from a Social Role Perspective. Promotor: J. Schaafsma. Co-promotor: P.J. van der Wijst. Tilburg, 3 June 2020.
72. Chrissy Cook. Everything You Never Wanted to Know about Trolls: An Interdisciplinary Exploration of the Who's, What's and Why's of Trolling in Online Games. Promotors: J. Schaafsma, M.L. Antheunis. Tilburg, 22 January 2021.
73. Nadine Braun. Affective Words and the Company They Keep: Investigating the interplay of emotion and language. Promotor: E.J. Kraemer. Co-promotor: M.B. Goudbeek. Tilburg, 29 March 2021.
74. Yueqiao Han. Chinese Tones: Can You Listen with Your Eyes? The Influence of Visual Information on Auditory Perception of Chinese Tones. Promotor: M.G.J. Swerts. Co-promotor: M.B.J. Mos, M.B. Goudbeek. Tilburg, 18 June 2021.
75. Tess van der Zanden. Language Use and Impression Formation: The Effects of Linguistic Cues in Online Dating Profiles. Promotor: E.J. Kraemer. Co-promotors: M.B.J. Mos, A.P. Schouten. Tilburg, 22 October 2021.

