



Fifty Shades of Twilight: A Computational Approach to Textual Adaptation

Julia Neugarten, Radboud University Nijmegen, julia.neugarten@ru.nl

Barbara Bordalejo, University of Lethbridge, barbara.bordalejo@uleth.ca

Joris J. van Zundert, Huygens Institute for History and Culture of the Netherlands, joris.van.zundert@huygens.knaw.nl

This paper analyzes the relationship between the Twilight Saga and Fifty Shades trilogy as a case study on the relationship between published fiction and fanfiction. We aim to develop computational methods for analyzing textual adaptation. To structure our analysis, we use Piper's (Piper 2017) five-step approach to literary modelling. First, we survey relevant scholarship from fan and adaptation studies. We theorize that the adaptation of the Twilight Saga into the fanfiction *Master of the Universe*, which resulted in Fifty Shades, resides primarily in its changing characterization of the protagonists, including their storyworld, and in an increased focus on sex. We conceptualize these aspects as revolving around the words used to describe characters, and the frequency with which sexually explicit words occur. We then detect words related to characterization and sex using three methods: corpus analysis with Sketch Engine, LIWC, and the measure of pointwise mutual information. Although anecdotal evidence shows patterns of adaptation across our corpora, these methods cannot be validated. This points to a fundamental and often overlooked problem in CLS research: the discipline can be understood as a way of testing empirical claims about literature using computational methods. In this view, theorization, or a researcher's subjective reading or analysis, is the first step in the research design. Subsequently, one may find, as we do here, that not all empirical claims about literature can be captured in computational operationalizations because the epistemologies of humans and computational literary studies methods are different. To answer the kinds of questions explored in this paper—questions inspired by human intuitions about literature and, in this case, adaptation—we need to re-evaluate the capacity of computational tools to do justice to the subtleties of narrative, and to examine the overlaps and gaps between quantitative and qualitative approaches to literature.



Cet article analyse la relation entre la saga Twilight et la trilogie Fifty Shades en tant qu'étude de cas sur le lien entre la fiction publiée et la fanfiction. Nous visons à développer des méthodes computationnelles pour analyser l'adaptation textuelle. Pour structurer notre analyse, nous utilisons l'approche en cinq étapes de Piper (Piper 2017) pour la modélisation littéraire. Premièrement, nous passons en revue les travaux pertinents issus des études sur les fans et sur l'adaptation. Nous théorisons que l'adaptation de la saga Twilight en fanfiction intitulée *Master of the Universe*, qui a donné naissance à Fifty Shades, réside principalement dans la transformation des caractéristiques des protagonistes, y compris leur univers narratif, et dans une focalisation accrue sur la sexualité. Nous conceptualisons ces aspects comme étant centrés sur les mots utilisés pour décrire les personnages, ainsi que sur la fréquence d'apparition des termes à caractère sexuel explicite. Nous détectons ensuite les mots liés à la caractérisation et à la sexualité à l'aide de trois méthodes : l'analyse de corpus avec Sketch Engine, LIWC, et la mesure de l'information mutuelle ponctuelle. Bien que des preuves anecdotiques révèlent des schémas d'adaptation dans nos corpus, ces méthodes ne peuvent être validées. Cela met en lumière un problème fondamental et souvent négligé dans la recherche en études littéraires computationnelles (computational literary studies ou CLS) : cette discipline peut être comprise comme une manière de tester des hypothèses empiriques sur la littérature à l'aide de méthodes computationnelles. Dans cette optique, la théorisation, ou la lecture et l'analyse subjective du chercheur, constitue la première étape de la conception de la recherche. Par la suite, on peut constater, comme c'est le cas ici, que toutes les affirmations empiriques sur la littérature ne peuvent pas être traduites en opérations computationnelles, car les épistémologies humaines et celles des méthodes en études littéraires computationnelles sont différentes. Pour répondre aux types de questions explorées dans cet article — des questions inspirées par des intuitions humaines sur la littérature et, dans ce cas, sur l'adaptation — il est nécessaire de réévaluer la capacité des outils computationnels à rendre justice aux subtilités du récit, et d'examiner les chevauchements et les écarts entre les approches quantitatives et qualitatives de la littérature.

1. Introduction

Between 2005 and 2008, Stephenie Meyer published the four books that make up the Twilight Saga: *Twilight*, *New Moon*, *Eclipse*, and *Breaking Dawn*. This series has sold over 100 million copies (Perez 2020), was translated into 37 languages (Relax News 2009), and adapted into five wildly successful films. Additionally, the Twilight Saga engendered an avid fan base, as well as an outspoken community of anti-fans (Pinkowitz 2011) who took pleasure in mocking and critiquing both the books and their fans. Between 2009 and 2011—a period of intense activity in Twilight Saga fanfiction communities—a writer under the pen name Snowqueens Icedragon released a two-part Twilight fanfiction (or fic) titled *Master of the Universe* (Snowqueens Icedragon 2009), known within the fanfiction community as MotU. According to some users of Fanfiction.net, the story eventually had an impressive 56,000 reviews shortly before it was removed from the website and moved to the author's own site (Fanlore 2023). In 2011 and 2012, MotU was lightly edited (Little 2012) and subsequently published for profit as the bestselling Fifty Shades trilogy—*Fifty Shades of Grey* (James 2011), *Fifty Shades Darker* (James 2012a), and *Fifty Shades Freed* (James 2012b)—by E. L. James.

Snowqueens Icedragon's decision to remove the stories from the internet, thereby making them permanently unavailable to the fan community, including some of the volunteer editors and reviewers that had helped bring the story its success, engendered controversy within the Twilight Saga fandom (Brennan and Large 2014; Jamison 2013; Jones 2014). The two most significant changes James made to *Twilight*, namely the removal of supernatural elements (known within the fan community as AU/AH or Alternate Universe/All Human fic) and the addition of sexual elements, were widespread in the Twilight Saga fanfiction community during that period. This explains some of the resistance against publishing fanfiction in the mainstream. As Jones notes:

The central issue in relation to fan exploitation and labor is that fan fic readers and reviewers did some of the work in creating *Master of the Universe*, but James took sole credit for its success. (Jones 2024, para. 3.4)

In other words, many fans felt that E. L. James was trying to profit individually from a communal creative process and effort. Such communal creative practices are standard in fanfiction communities, where “fan fic writing is often a communal experience in which fan fiction and feedback feed on one another” (Busse 2017, 118). Such a collaborative mode of writing is more unusual in mainstream publishing. This different set of norms led to a clash of mores in this case.

Because of the conflict in the fan community surrounding James's decision to publish her fanfiction as an original trilogy, and because of the immense mainstream success of those books (Aviles 2019), the *Twilight* Saga and *Fifty Shades* trilogy provide an interesting case study on the relationship between published or publishable fiction and fanfiction. The current paper aims to assess how this relationship can be studied and measured using tools from the field of computational literary studies (CLS).

CLS is often concerned with finding proxies. For example, while a computer may be hard-pressed to identify shifting perspectives in literary texts, it can detect changes in the use of personal pronouns (van Rossum et al. 2020), which can then be taken as signals that a shift in perspective has occurred. In such a research design, personal pronouns function as a proxy for literary perspective. This process of literary modelling through proxies usually consists of five steps, as explained by Andrew Piper (Piper 2017). The first of these is "theorization. What is the theoretical goal of the model?" (Piper 2017, 653). Second is "conceptualization: What are the conceptual proxies for the hypothesis?" (Piper 2017, 653). Moving towards the more practical, Piper then turns to "implementation. How will these concepts be made actionable—that is, how will they be measured?" (Piper 2017, 654). Next comes "selection: What data are appropriate for answering the question that my model poses?" (Piper 2017, 654). Finally, Piper argues there should be a process of "validation: How do we know that the inferences we draw from our model are valid?" (Piper 2017, 654). The current paper assesses the usefulness of this proxy-based CLS approach for studying adaptation, taking the adaptation of the *Twilight* Saga into the *Fifty Shades* trilogy as a case study. This case study already answers the question of data selection, as it limits the data used in this study to the two sets of books.

We thus examine four research questions:

1. *Theorization*: How can the process of literary adaptation that occurred when the *Twilight* Saga was adapted into *Fifty Shades* be theorized for the purposes of computational literary analysis?
2. *Conceptualization*: Where in these texts does the process of adaptation reside or become visible? In other words, what are the conceptual proxies for our theorization of adaptation?
3. *Implementation*: How can these proxies be measured computationally?
4. *Validation*: How well do these proxies identify the process of adaptation we theorized?

As we will show, Piper's five-step approach to the computational modelling of literary texts is a useful tool, especially for those strands of CLS that take the subjective observations of individual scholars as a starting point for computational analysis.

2. Theorization

How can the process of literary adaptation that occurred when the Twilight Saga was adapted into Fifty Shades be theorized for the purposes of computational literary analysis?

There are two moments of transformation in this case study, visualized in **Figure 1** as the two arrows: the adaptation from the Twilight Saga into the fanfiction *Master of the Universe*, and the adaptation of that fanfiction into the Fifty Shades trilogy. Note that we use Fifty Shades to refer to the trilogy as a whole, and *Fifty Shades of Grey* to refer to the trilogy's first novel. Likewise, we use Twilight Saga to refer to the entire series, and *Twilight* to reference its first novel. The changes made from *Master of the Universe* to the published Fifty Shades books are minimal: character names were changed to avoid copyright infringement, and the two-part fanfiction was turned into a three-part book series. These changes seem primarily practically and financially motivated.

The changes made when adapting Twilight into fanfiction—the first arrow in **Figure 1**—are more interesting from the perspective of fandom studies and adaptation studies. When reading the Twilight Saga and Fifty Shades novels, two main transformations stand out: the danger and appeal of the love interest's vampirism is changed into the danger and appeal of his kinky sexual appetites and enormous wealth, and the relatively chaste and subtextual attraction between the teenage protagonists is transformed into a sexually explicit love affair between adults. These changes do not affect the young woman's sexual inexperience at the beginning of the relationship. As mentioned in the introduction, these two shifts—from supernatural to human characters and from chaste YA romance to outright erotica—are common tropes of Twilight Saga fanfiction.

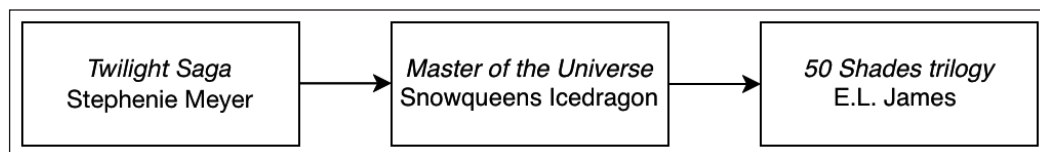


Figure 1: Timeline of the three sets of texts in our case study.

2.1 Background: Erotica as fannish transformation

In fanfiction communities, the published works fanfiction is based on are called “canon.” Fanfiction reinterprets and transforms this canon. Catherine Tosenberger asserts that “fanfiction is given life by what other spaces don’t allow, it [...] fills those spaces with stories for which the canon has neither room nor desire” (Tosenberger 2014, 17). Fanfiction can thus be conceptualized as a narrative space to explore non-normative topics and perspectives. MotU’s strong emphasis on sexual dynamics of submission and domination is such a non-normative topic.

However, although *Fifty Shades* is more overtly about sexual acts than the *Twilight* Saga, the two sets of books share a relatively non-explicit way of describing sexual encounters. Despite its reputation as explicit erotica and the frequent references in mainstream media describing the books as porn (Seifert 2008; Paris 2016; Deller and Smith 2013), *Fifty Shades* describes sexual acts and situations in surprisingly non-explicit terms. For this reason, *Fifty Shades* has also been described as “mommy porn” (Paris 2016). Deller and Smith define this as porn “so tame and vanilla that even mothers indulge in it” (Deller and Smith 2013, 936). In other words, this is porn without the explicitness that characterizes many other works in the genre. For example, the following paragraph is an intimate scene taken from the *Fifty Shades* trilogy:

Holding my behind, his fingers digging into my soft flesh, he begins to move, slowly at first—a steady even tempo ... but as his control unravels, he speeds up ... faster, and faster. Ahhh! I tip my head back and concentrate on the invading, punishing, heavenly sensation ... pushing me, pushing me ... onward, higher, up ... and when I can take no more, I explode around him, spiraling into an intense, all-consuming orgasm. He lets go with a deep growl, and he buries his head in my neck. (James 2011, 333)

Arguably, the only explicit word used in this passage is “orgasm.” No genitals are mentioned. Physical experiences are glossed over or described in abstract terms like “sensation.” The most direct reference to a body part in this passage is the almost childlike use of the word “behind.” Additionally, the description lacks detail. The word use is simple and vague; the vocabulary is limited.

In its sanitized, abstracted descriptions of sexual desire and acts, *Fifty Shades* and the *Twilight* Saga are similar. Take, for example, the following two quotes, one taken from the final *Twilight* Saga novel and the other from *Fifty Shades*:

I could taste his pure, vivid scent on my tongue and feel the unbelievable silkiness of his marble skin under my sensitive fingertips. My skin was so sensitive under his hands, too. [...] our bodies tangled gracefully into one on the sand-pale floor. (Meyer 2008, 530)

I gaze up at him, drinking him in. He leans down and gently kisses me, and I can't help myself. I throw my arms around his neck and my fingers twist in his still damp hair. Pushing my body flush against his, I kiss him back. I want him. (James 2011, 259)

Thus, it is perhaps more accurate to say that the two sets of books share a lack of explicitness. This lack of explicitness in *Fifty Shades* stems from the fact that the text can be described as lexically poor or limited, which, together with its unwillingness to

name sexual acts and body parts, results in a style characterized by deictic expression. As the connotations in the novel are contextually determined, the text is as sanitized as a supposedly explicit text can be.

A subtextual but non-explicit engagement with sexual subject matter is characteristic of much fiction about vampires. The history of vampire lore literature has been characterized by sexual sublimation. A psychoanalytic critique is not required to see that fangs can be read as a phallic symbol and that penetration plays a major role in the spreading (contagion/conversion) of vampirism. Thus, in fiction about vampires, “the fatal penetrations of a vampire’s bite displace/replace the unspeakable sexual penetrations they signify” (Nakagawa 2011, 2–3). The sucking of blood, which has been linked to the process of procreation (Mascia 2011) but also evokes the image of the breast, is another significant and sexually charged feature of the genre.

Stephenie Meyer’s reimagining of the vampire presents a different view compared to previous fiction in the genre. In the *Twilight* Saga, vampires are venomous and, by biting, they poison their victims so they can turn into vampires themselves, if they are not killed by the bite. In Meyer’s storyworld, the ability to turn humans into vampires is an act of immense self-control rather than choice: the vampire must exert significant restraint to avoid draining humans in order to turn them into fellow vampires.

This emphasis on vampires’ almost superhuman restraint also characterizes the representation of sexuality in *Twilight*. For all the desire implied in their relationship, Bella and Edward are uncannily chaste. Bella insists on having sex with Edward while she is still human, while Edward continually finds excuses to postpone this. The tension of the *Twilight* Saga arises from this will-they-won’t-they discussion. In his refusal to have sex with Bella before marriage,

Edward represents a “safe” sexuality: his simultaneous passion for Bella and his protection of her virtue result in a romantic hero who is both sexually charged and chaste. (Aubrey, Behm-Morawitz, and Click 2010, para. 2.6)

This stands in stark contrast to Christian’s sexuality in *Fifty Shades*, which is portrayed as dangerous: Anastasia watches him “like a rare and dangerous predator” (James 2011, 243), his eyes “glitter dangerously” (James 2011, 244) or “flash dark and dangerous” (James 2011, 69). Aubrey, Behm-Morawitz, and Click further note that *Twilight* employs a cultural script which “portrays sexualized violence in ways that depict the victim as secretly desiring and eventually deriving pleasure from the violence. This is similar to Bella’s experience, as she eventually decides that even if Edward’s passion proves too much, the sacrifice of her life would be worth the fleeting

pleasure of being with him” (Aubrey, Behm-Morawitz, and Click 2010, para. 4.5). This notion that victims experience pleasure in response to sexual violence is mirrored in *Fifty Shades*.

In their mixing of romance and danger, the *Fifty Shades* trilogy is not unlike the genre Janice Radway has called the modern gothic. She explains that this genre “differs substantially from the original gothic in that its explorations of evil and terror are more fully subordinated to the details of the primary romantic plot” (Radway 1981, 144). By providing this mix, the modern gothic simultaneously offers an escape from traditional gender roles by depicting women who have dangerous and thrilling adventures, and an affirmation of these roles by adhering to the traditional structure of the romance genre.

2.2 Background: Fanfiction as a mix of sameness and difference

It is not surprising that the two series share many characteristics, since fanfiction tends to be written out of love for aspects of the canon (Kelley 2021). Fanfiction thus almost always combines similarity to canon with canon divergence. Aspects of fanfiction that can mirror or transform canon include but are not limited to character, storyworld, plot, genre, ideology, and style.

Characters are key to both fanfiction and its reception (Neugarten et al. 2024). Compared to canon, characters in fanfiction are sometimes depicted as more emotionally open or closed, more assertive or vulnerable, or different in terms of appearance, occupation, social or cultural context, or even species. *Fifty Shades* transforms the character of Edward from an ancient vampire to a CEO in his late twenties, and from an emotionally open man to one who is less inclined to share his feelings or personal history. Bella is changed from a clumsy high-school student to an even clumsier and more insecure young woman. These characterization changes are intimately related to the change in storyworld; the inequality that, in *Twilight*, comes from Edward being a supernatural creature, originates in *Fifty Shades* from the difference in economic security and social confidence between the protagonists. With regards to storyworld, alternate universe or AU fanfiction is also a common trope. Popular AUs include magical realism, a high school setting or a coffee shop setting. Each of these carries its own genre expectations. *Fifty Shades* is an all-human AU of the *Twilight* Saga.

Fanfiction can be either very close to canon or diverge widely from it in terms of plot and subject matter: while some fanfiction sticks closely to the canon’s plot, other stories, like *Fifty Shades*, have their own. Some Sherlock Holmes fanfiction may contain

all the generic elements of a crime narrative, while other fanfiction foregoes the crime plot in favour of a stronger emphasis on romance. Similarly, in the case of *Fifty Shades*, the absence of supernatural creatures or high school drama drastically changes the subject matter of the story. In this sense, *Fifty Shades* strongly diverges from *Twilight* Saga canon.

Perhaps most interestingly, fanfiction may diverge from canon in terms of its political or ideological underpinnings, such as representation of diversity or shifting power dynamics. Some fanfiction takes a political stance by centring the perspective of a minority character or emphasizing the oppressive messages underlying a canonical work. By contrast, *Fifty Shades* does not seem to question the unequal and gendered power dynamics between the lovers in *Twilight*. As Byrne and Fleming note, “the deeper structures of *Twilight*, *Master*, and *Fifty Shades* retain the characteristics of romance, including its patriarchal attitudes” (Byrne and Fleming 2018, 6). Such attitudes include a pervasive sense of inequality between the protagonists: the male love interest is in myriad ways more desirable or perfect than the female.

In terms of style and mode of narration, *Twilight* and *Fifty Shades* are both narrated from the perspective of the female protagonist. Some fanfiction diverges much more strongly from the style of the canon, for example by narrating the story solely through exchanges of text messages. In this case, both sets of texts are first-person accounts of a developing intimate relationship, narrated from the female point of view. This female focalizer also has similar characteristics in both texts. As noted by Srdarov and Bourgault du Coudray:

Both *Twilight* and *Fifty Shades of Grey* feature archetypal romance heroines. Anastasia is older than Bella, but both are depicted as naïve, virginal, innocent, clumsy, and yet feisty, intelligent and determined. (Srdarov and Bourgault du Coudray 2016, 2)

These similarities in the dynamic between the protagonists and the novels’ mode of narration make them all the more suitable for a comparative computational analysis.

2.3 Theorizing the adaptation

*How can the process of literary adaptation that occurred when the *Twilight* Saga was adapted into *Fifty Shades* be theorized for the purposes of computational literary analysis?*

Based on reading the books, we contend that the changes of this adaptation reside in several key areas, visualized in **Figure 2**:

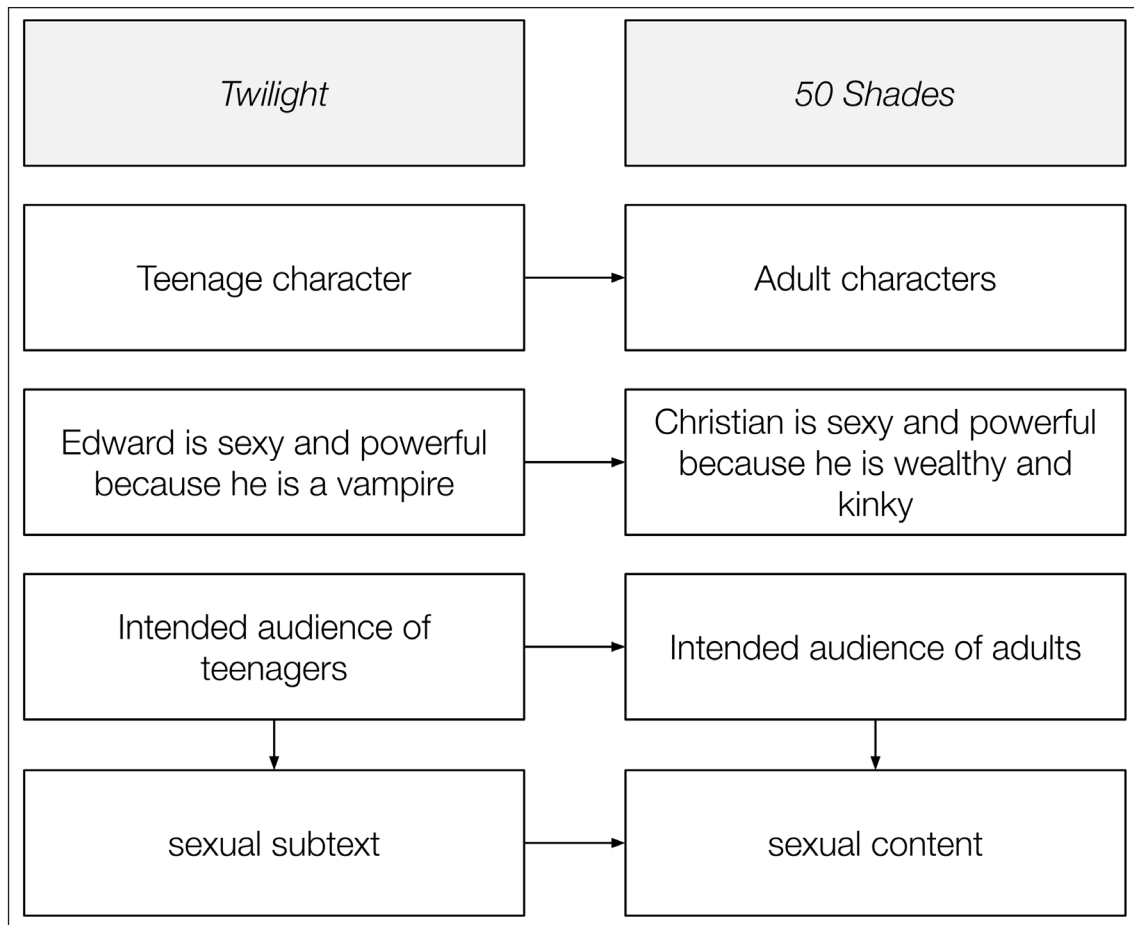


Figure 2: Overview of key transformations from the Twilight Saga to Fifty Shades.

- The characters are adults. This means that their setting (professional) and the nature of their relationship (sexual) are different from the Twilight Saga.
- Instead of being a vampire, the male love interest is considered dangerous because he is kinky and powerful because he is wealthy. These changes mean that a power imbalance between the lovers that was present in the Twilight Saga is also present, albeit for different reasons, in Fifty Shades.
- The intended audience has shifted from teenagers to adults. The Fifty Shades trilogy thus engages with sexual subject matter more overtly.

3. Conceptualization

Where in these texts does the process of adaptation reside or become visible? In other words, what are the conceptual proxies for our theorization of adaptation?

We hypothesize that the adaptations identified in Section 2 reside in two computationally quantifiable textual elements or proxies. The first of these is characterization of the protagonists, which we quantified by examining adjectives

used to describe them, verbs used to describe their actions, and adverbs used to qualify their actions. The second is the amount of sexual content in the text, as well as the level of explicitness (textual versus subtextual) of the words used to describe this sexual content.

To measure these proxies, we tried out several methods outlined in Section 4. Our dataset, the TwiShades corpus, contained two subcorpora: a Twilight Saga corpus of Stephenie Meyer’s books *Twilight* (Meyer 2005), *New Moon* (Meyer 2006), *Eclipse* (Meyer 2007), and *Breaking Dawn* (Meyer 2008), and a Fifty Shades corpus of E. L. James’s *Fifty Shades of Grey* (James 2011), *Fifty Shades Darker* (James 2012a), and *Fifty Shades Freed* (James 2012b). The size of the TwiShades corpus is listed in **Table 1**.

Tokens	1.374.929
Words	1.072.733
Sentences	116.863
Documents	7
Tokens <i>Twilight Saga</i> subcorpus	742.906 (54% of the corpus)
Tokens <i>Fifty Shades</i> subcorpus	632.023 (46% of the corpus)

Table 1: The size of our corpus and subcorpora, measured in Sketch Engine.

4. Implementation

How can these proxies be measured through computational tools?

To compare the characterization of the protagonists and the level of sexually explicit content between the Twilight Saga and Fifty Shades corpora, we tested three different methods: corpus analysis with Sketch Engine (Kilgarriff et al. 2014), pointwise mutual information or PMI, and Linguistic Inquiry and Word Count or LIWC (Pennebaker et al. 2015). This section describes these three methods and their usefulness in detecting and quantifying the adaptation of the Twilight Saga.

4.1 Sketch Engine

We used the corpus workbench Sketch Engine (Kilgarriff et al. 2014) to detect and compare words used to describe the protagonists and their actions between corpora. Sketch Engine lets users upload their own corpora, define subcorpora within them, and conduct analyses of collocations, keywords, and word frequencies. We used the search terms “Edward” and “Bella” (the protagonists of the Twilight Saga) and “Christian” and “Anastasia” (the protagonists of Fifty Shades), as well as various personal pronouns and nicknames to identify moments in the text where these characters and their actions were described.

We also used Sketch Engine to search both corpora for words related to sexual situations. As illustrated in Section 2.1, explicit terms are few and far between, even in the sexual scenes of *Fifty Shades*, due to the relatively sanitized nature of the language use. Our Sketch Engine searches thus yielded few results. Instead, close readings of these scenes show that relatively innocuous words, like “soft,” “hard,” “stare,” “gaze,” and “him” frequently have a sexual connotation in *Fifty Shades*. This is partly because E. L. James has the tendency to substitute nouns that signify sexual organs with personal pronouns. In this way, the pronouns “he/him,” which would normally refer to a person, become a *totum pro parte* used to refer to Christian Grey’s genitalia. This use of vague, non-explicit terms made our task of computationally analyzing the representation of sexuality in the text more challenging because they prevented us from using distinctive lexical items.

4.2 Pointwise mutual information

Our initial exploration of the corpora in Sketch Engine resulted in some clear pointers for further analysis. Specifically, the word “hard” proved to be an indicator of erotic scenes. We use pointwise mutual information (PMI) to compare the use of the words “hard” and “harder” between subcorpora. We also examined the words “soft,” “gaze,” and “stare,” through PMI.

PMI is the ratio of the probability of seeing a bigram (a pair of words) versus the probability of independently seeing the two words that make up the bigram (Figure 3). In other words, PMI expresses the probability of a collocation occurring given the occurrence of the individual words (Bouma 2009). Thus, PMI is a way to measure collocational patterns while taking into account that the co-occurrence of words is strongly impacted by the frequency or occurrence of individual words.

$$PMI_{(w1,w2)} = \log_2 \frac{Count(w1w2) \cdot N}{Count(w1) \cdot Count(w2)}$$

Figure 3: The PMI formula.

In this case, we used skipgrams in a window of seven tokens rather than bigrams. Words are thus counted as neighbours for the purposes of our PMI analysis as long as they are within seven words of each other. In a phrase like “he looked at me with a hard gaze” the co-occurrence of “looked” with “hard” is still a potential indicator of whether “hard” is related to erotic content in the sentence, even though there are four words separating “looked” from “hard.” The window size of seven was chosen based on the mean sentence length in our corpus. PMI is calculated as shown in Figure 3, where w = word and N = total number of words in the texts’ vocabulary.

4.2.1 Interpreting PMI

Table 2 displays the following results: first you see the first word in the analyzed bigram, then you see the second word in the analyzed bigram. Third, you see the total number of times a bigram occurred (within a seven-word window of each other, meaning three words on either side of the target words) in the subcorpus, and finally you see the normalized PMI value. PMI results were normalized—all values fall between -1.0 and 1.0—to facilitate easy comparison across corpora. A PMI value above 0.5 indicates that the occurrence of the two words is positively associated, while a value below 0.5 indicates a dissociation or negative association between the occurrence of words. A value approximating 1.0 indicates a very strong association.

word 1	word 2	absolute fq. <i>Twi</i>	N-PMI <i>Twi</i>	absolute fq. in 50	N-PMI 50	diff. N-PMI
hard	he	5	0.089	31	0.266	-0.177
hard	him	5	0.240	7	0.198	0.042

Table 2: Normalized PMI results (N-PMI) for word-pairs “hard + he” and “hard + him.”

When interpreting these results, it is worth noting that the PMI analysis was run on the corpora after lemmatization, meaning that occurrences of the word “harder” were a subset of occurrences of “hard.” None of the associations are particularly strong, but the association between “he” and “hard” is stronger in *Fifty Shades* while the association between “him” and “hard” is stronger in the *Twilight Saga*. Closer inspection of these collocations using Sketch Engine reveals that while, in the *Twilight Saga*, this combination refers to Edward’s skin, mouth, and hands, which are hard as stone because he is a vampire, in *Fifty Shades*, “he” is used as a *totum pro parte* to refer to Christian’s penis. In this case, both sets of texts thus employ the same collocational patterns to convey very different levels of sexual connotation.

4.3 Linguistic Inquiry and Word Count

Finally, we used Linguistic Inquiry and Word Count or LIWC (Pennebaker et al. 2015) to calculate the percentage of words related to a specific domain of meaning in our corpora as defined by LIWC’s dictionaries. LIWC is a tool for analyzing word use that consists of two parts. The first is a set of dictionaries through which categories of meaning are defined. The second is an interface that allows users to upload texts, then counts every occurrence of a word from one of the dictionaries and expresses these counts in percentages. For example, the word “sister” occurs, among others, in the LIWC categories *social*, *family*, and *female*. Therefore, the sentence “I love my sister” would score 25% in these categories, since 25% (or one-quarter) of words in the sentence fall into that category.

We measured the usage of words from specific domains (operationalized through the LIWC categories) in the first books of both the Twilight Saga and Fifty Shades trilogy, and within the set of all words positively associated (according to PMI) with the four target words we selected based on their frequent occurrence in intimate scenes in both series of books: “soft,” “hard,” “gaze,” and “stare.” We aimed to get a sense of the semantic fields represented by these results. We then compared the LIWC results for the PMI data to the LIWC results for the books as a whole and compared results between the two books.

Table 3 and **Table 4** present LIWC results for the full texts of each book series. **Table 5** presents a LIWC analysis of the PMI results of the focus words for the first book in each series. Some LIWC categories stand in a hierarchical relation to each other: “female” and “male” are both subcategories of “social”; “see,” “hear,” and “feel” are the three subcategories that make up “perception”; and “body,” “health,” “sexual,” and “ingest” (short for “ingestion”) together make up the “bio” category. We have visualized this in the tables by italicizing subcategories and giving each category its own colour.

	<i>social</i>	<i>female</i>	<i>male</i>	<i>percept</i>	<i>see</i>	<i>hear</i>	<i>feel</i>	<i>bio</i>	<i>Body</i>	<i>health</i>	<i>sexual</i>	<i>ingest</i>	<i>swear</i>
Twilight 1	11.76	0.98	4.39	5.52	2.38	1.63	1.27	3.15	2.25	0.44	0.01	0.43	0.03
Twilight 2	10.03	1.03	3.59	4.97	1.97	1.5	1.29	3.09	2.25	0.5	0.01	0.32	0.05
Twilight 3	12.05	1.24	4.01	5.02	1.85	1.56	1.38	3.14	2.4	0.39	0.02	0.29	0.05
Twilight 4	11.47	2.12	2.78	5.12	1.88	1.48	1.48	3.35	2.49	0.49	0.03	0.33	0.07
Avg. Twi.	<i>11.33</i>	<i>1.34</i>	<i>3.69</i>	<i>5.16</i>	<i>2.02</i>	<i>1.54</i>	<i>1.36</i>	<i>3.18</i>	<i>2.35</i>	<i>0.46</i>	<i>0.02</i>	<i>0.34</i>	<i>0.05</i>

Table 3: LIWC results for the Twilight Saga.

	<i>social</i>	<i>female</i>	<i>male</i>	<i>percept</i>	<i>see</i>	<i>hear</i>	<i>feel</i>	<i>bio</i>	<i>body</i>	<i>health</i>	<i>sexual</i>	<i>ingest</i>	<i>swear</i>
Fifty 1	12.28	1.02	5.28	5.59	2.45	1.14	1.76	4.78	3.32	0.45	0.38	0.75	0.4
Fifty 2	13.3	1.1	5.97	5.64	2.4	1.27	1.73	4.74	3.38	0.38	0.32	0.66	0.41
Fifty 3	13.16	1.39	5.74	5.89	2.44	1.4	1.76	4.95	3.61	0.43	0.34	0.57	0.49
Avg. Fifty	<i>12.91</i>	<i>1.17</i>	<i>5.66</i>	<i>5.71</i>	<i>2.43</i>	<i>1.27</i>	<i>1.75</i>	<i>4.82</i>	<i>3.44</i>	<i>0.42</i>	<i>0.35</i>	<i>0.66</i>	<i>0.43</i>

Table 4: LIWC results for the Fifty Shades trilogy.

	social	female	male	percept	see	hear	feel	bio	body	health	sexual	ingest	swear
<i>hard</i> Fifty	7.38	0.61	1.23	9.43	2.25	2.05	4.51	9.02	5.53	0.61	1.23	1.64	1.43
<i>hard</i> Twi.	11.26	0.33	1.99	7.62	3.31	1.99	1.99	6.62	4.30	1.32	0.00	0.66	0.00
<i>soft</i> Fifty	7.77	0.42	1.47	10.71	3.57	1.89	4.20	8.82	6.51	0.42	1.47	1.05	1.26
<i>soft</i> Twi.	11.39	0.63	1.27	13.29	4.43	6.33	1.27	4.43	2.53	0.63	0.00	0.63	0.00
<i>stare</i> Fifty	9.94	0.64	1.92	8.01	4.49	0.96	1.92	8.01	3.85	0.64	0.64	2.88	0.64
<i>stare</i> Twi.	8.99	1.12	3.37	6.74	3.37	2.25	1.12	2.25	2.25	0.00	0.00	0.00	1.12
<i>gaze</i> Fifty	8.70	1.55	1.24	11.49	5.28	1.86	4.35	6.83	4.66	0.31	0.93	1.55	0.62
<i>gaze</i> Twi.	10.79	0.72	2.16	8.63	5.76	0.72	1.44	3.60	2.88	0.00	0.00	0.72	0.00

Table 5: LIWC analysis of PMI results for the first book in each series.

These LIWC results give some insight into the semantic fields present in the PMI results for “soft,” “hard,” “gaze,” and “stare.” Analyzing tokens identified by PMI as significantly collocated with the focus words, we discovered that more words from the LIWC category “perception” occur around the term “hard” in *Fifty Shades* than in *Twilight* (9.43% vs. 7.62%). *Twilight* shows more perceptions terms around “soft” (13.29% vs. 10.71%). Thus, perceptions are more frequently described as “hard” in *Fifty Shades* and more frequently as “soft” in *Twilight*. This could signal something about the nature of erotic encounters in these books, as perception-related words are likely to occur frequently in scenes describing such encounters. However, a closer look at the texts themselves would be needed to validate this intuition.

In *Fifty Shades*, the word “stare” more frequently occurred near words relating to biological features or processes (8.01%) than in *Twilight* (2.25%). Similarly, “gaze” occurred frequently around words relating to biological processes in *Fifty Shades* (6.83%) and only 3.60% in *Twilight*. It thus appears that biological processes and parts of the body are more often looking and being looked at in *Fifty Shades*. This also aligns with our preconceived notion that eroticism is more textual in *Fifty Shades*, while it remains more subtextual in *Twilight*.

Our analysis confirms that *Twilight* is not very explicit: on average, the Saga scores 0.02% in LIWC’s sexuality category and 0.05% for swearing. While for *Fifty Shades* the scores in the sexuality and swearing categories are also low—the trilogy contains

0.35% sexual words averaged over all four books, and 0.43% swear words—this is over 17 times more for sexual words and over 8 times more for swear words. This observation aligns with our exploratory analysis of *Fifty Shades* in Sketch Engine, where we found few sexually explicit words. At the same time, relative to the *Twilight* Saga, *Fifty Shades* is much more explicit—even if this explicitness is not lexical.

Both series of books, when analyzed as a whole using LIWC, contained a high percentage of words relating to the male gender (3.69% on average for the *Twilight* Saga and 5.66% for *Fifty Shades*, with only a little over 1% female-related words in both series). Intuitively, this makes sense because both are first-person narratives by female narrators preoccupied with their male objects of affection. However, in both texts, male-related words were much less frequent in the PMI results relating to focus words than in the texts as a whole, fluctuating between 1.23% and 3.37%. In *Fifty Shades* this difference was more pronounced, with none of the PMI results containing more than 2% male-related terms. In other words, while male-related words are more prevalent in both texts compared to female-related words, this difference becomes much smaller in the PMI results, (i.e., in words likely to co-occur with the words “hard,” “soft,” “gaze,” and “stare”). The words surrounding our selected terms are not marked by a difference in gender-related words.

All the analysis in this section should be taken with a grain of salt, because interpreting the results of the LIWC analysis of our PMI measures in terms of meaningful differences between these two sets of texts is methodologically complicated. Because of the relatively small size of our corpora, calculating the statistical significance of these scores would suggest more certainty than the numbers actually allow for. Additionally, using LIWC to analyze PMI results means stacking interpretations of the data on top of each other, with the possibility that our tools are not measuring accurately increasing with each step.

To counteract some of this interpretive difficulty, we establish a baseline against which the LIWC analysis of our PMI results can be evaluated. As a baseline, we have taken the average score of each LIWC category for each book series as a whole (see **Table 3** and **Table 4**, rows labelled *Avg. Twilight* and *Avg. Fifty*) and compared it against the LIWC scores for the PMI results. In other words, this approach lets us assess whether the semantic fields (operationalized through LIWC categories), presented in the PMI results for each focus word are comparable to the semantic fields most present in the book series overall. This comparison led to the results in **Table 6** for the *Twilight* Saga and **Table 7** for *Fifty Shades*. Scores higher than the series average are visualized in green while scores lower than the series average are visualized in red.

Almost all our focus words (“hard,” “soft,” “gaze,” and “stare”) occur around perception-related terms in *Twilight* with a frequency higher than the series average. However, this finding is somewhat complicated by the fact that the focus words

Twilight	social	female	male	percept	see	hear	feel	bio	body	health	sexual	ingest	swear
Hard	11.26	0.33	1.99	7.62	3.31	1.99	1.99	6.62	4.30	1.32	0.00	0.66	0.00
Soft	11.39	0.63	1.27	13.29	4.43	6.33	1.27	4.43	2.53	0.63	0.00	0.63	0.00
Stare	8.99	1.12	3.37	6.74	3.37	2.25	1.12	2.25	2.25	0.00	0.00	0.00	1.12
Gaze	10.79	0.72	2.16	8.63	5.76	0.72	1.44	3.60	2.88	0.00	0.00	0.72	0.00
Avg. Twi	11.33	1.34	3.69	5.16	2.02	1.54	1.36	3.18	2.35	0.46	0.02	0.34	0.05

Table 6: Comparing PMI results for Book 1 to the Twilight Saga average.

Fifty	social	female	male	percept	see	hear	feel	bio	body	health	sexual	ingest	swear
hard	7.38	0.61	1.23	9.43	2.25	2.05	4.51	9.02	5.53	0.61	1.23	1.64	1.43
soft	7.77	0.42	1.47	10.71	3.57	1.89	4.20	8.82	6.51	0.42	1.47	1.05	1.26
stare	9.94	0.64	1.92	8.01	4.49	0.96	1.92	8.01	3.85	0.64	0.64	2.88	0.64
gaze	8.70	1.55	1.24	11.49	5.28	1.86	4.35	6.83	4.66	0.31	0.93	1.55	0.62
Avg. 50	12.91	1.17	5.66	5.71	2.43	1.27	1.75	4.82	3.44	0.42	0.35	0.66	0.43

Table 7: Comparing PMI results for Book 1 to the Fifty Shades average.

themselves are related to perception. The words “hard,” “soft,” and “gaze” also have PMI results more frequently related to the body than the series average. In Fifty Shades, a similar pattern emerges, with our focus words occurring more often than the series average around words related to perception and biological processes. In other words, this approach does not show meaningful differences, transformations, or adaptations from the Twilight Saga to Fifty Shades when it comes to the collocational environment of the focus words.

5. Validation

How well do these proxies identify the process of adaptation we theorized?

Combining Sketch Engine, PMI, and LIWC, we aimed to develop a method to detect the transformation or adaptation from the Twilight Saga into Fifty Shades. We narrowed down this transformation to two aspects: the characterization and the level of sexual explicitness. Using Sketch Engine, we were able to identify how

characters were described in both subcorpora and identified some differences or shifts in characterization. However, measuring the changing level of sexual explicitness in the adaptation proved more challenging, since much of the sexually explicit content in James's prose resides in non-explicit words, such as personal pronouns.

Our main challenge, then, was adapting computational methods like PMI in such a way that the measure can take semantic value into account (i.e., "interpret" how a word is used). While all methods used here have previously been applied in textual analysis (Pearce 2008; Kahn et al. 2007), we found it difficult to apply them to prose fiction. For example, the PMI measure is not an ideal tool for comparing collocations in small numbers of texts with specific hermeneutical questions in mind, because it does not model specific semantic values very well. Specifically, PMI does not differentiate between semantic fields: "him" is a super high frequency pronoun, but in the Fifty Shades subcorpus, this word also refers to a penis in specific scenes. Because of our focus on the texts' representation of sexuality, we need to develop a method to distinguish these sexual uses of the word "him" from more everyday ones. When measuring PMI, the relevant occurrences of the word "him" are drowned out by its normal or non-sexual use. Similarly, LIWC does not take into account the specific ways of expressing semantic fields in these particular books: it will always count "him" in the male category but never in the "sexual" category.

To draw conclusions about the representation of sexuality in these texts by comparing collocations, we thus need to develop a more semantically informed model adapted to the limitations in our data. This requires a differentiation between different senses of the same word, such as "him" for "specific male person" versus "penis of a specific male person" but also "hard" meaning "difficult" versus "hard" meaning "with significant strength or force" and "hard" meaning "erect." Differentiating such polysemy could be achieved through annotation, especially since our corpus is relatively small. However, annotating this specific corpus does not contribute to a more general understanding of how adaptations can be measured computationally. Additionally, while the process of annotation can be used to quantify a qualitative hypothesis, this process is perhaps closer to traditional close reading than to computation. In this sense, too, it does not contribute to our overarching aim of developing computational approaches to processes of textual adaptation. It is worth noting that since we conceptualized and realized our research, the uptake and rapid development of AI and LLMs has made it possible to automate annotation processes in ways that were not available when we carried out our work. These new implementations could and should be explored in the context of lexically poor texts requiring semantically informed models separating different uses of particular words.

6. To conclude

In this paper, we *theorized* that the adaptation of the Twilight Saga into Fifty Shades resides primarily in its changing characterization of the protagonists, including the storyworld these characters live in, and in its increased attention to sexual subject matter. We then *conceptualized* these two aspects as revolving around the words used to describe the characters, and the frequency with which sexually explicit words were used. Then, we *implemented* our approach by detecting words related to characterization and sex in Sketch Engine. However, a corpus search of sexually explicit terms yielded few results, because the language of our samples was oblique and relied heavily on the reader’s understanding. Instead, we found that words related to “hardness,” “softness,” “gazing,” and “staring” conveyed erotic tension in both subcorpora. Rather than adapting or changing the way sex is described in the Twilight Saga, Fifty Shades uses a similar set of non-explicit terms to connote eroticism. In other words, a closer look at the data shows that using sexually explicit terminology as a proxy for sex scenes in these books cannot be *validated*.

6.1 Discussion

In this paper, we strived for a transparent and explainable computational approach to adaptation that requires minimal code literacy. For this reason, we have not tested machine learning approaches like vector space models or natural language processing pipelines. However, research by Rowe, Henderson, and Wang suggests that vector space models can be useful in comparing characterization between canon and fanfiction (Rowe, Henderson, and Wang 2021), and the FanfictionNLP pipeline (Yoder et al. 2021) also seems to yield promising results when it comes to character detection in fanfiction data. For mapping the (gendered) power dynamics between fictional characters, Riveter (Antoniak et al. 2023) has proven to be a promising tool, especially in fanfiction texts (Neugarten 2025). These approaches provide potentially fruitful avenues for future research. Some of these also have the potential to address the shortcomings of CLS methods for analysis of textual adaptation that we identified in this paper.

Additionally, examining the different distribution of gender-related words in these texts could be a fruitful next step. We found that both sets of novels contained more male-related than female-related words as a whole, but these differences largely disappeared when zooming in on the PMI of our focus words. Investigating this difference further could aid a subtler understanding of how gender relations are represented and transformed in erotica, fanfiction, and the paranormal or gothic romance genres. However, it is also possible that LIWC detected a high frequency of male-related words because of E. L. James’s frequent use of the term “him” to describe the sexual organ.

It is worth noting that our final research question—“how well do these proxies identify the process of adaptation we theorized?”—assumes that we accurately identified some of the key ways the *Twilight Saga* was transformed in the process of becoming *Fifty Shades*. Of course, the accuracy of our interpretation is a matter of opinion, and other similarities and differences can be identified when comparing these sets of texts. These other aspects of adaptation would require other computational proxies.

This final caveat, regarding the solidity of our subjective interpretation of the texts, touches on an important divide in computational literary studies. On the one hand, CLS can be understood as a way of testing empirical claims about literature using computational methods. In this view, a researcher’s subjective reading or analysis is always the first step in the research design, in this case, our *theorization* step. Research of this type assumes that literature can best be understood by humans, and humans can then employ and finetune computational tools to test their understanding against the literary evidence. This approach is defensible, since most literary texts are geared towards a human readership.

On the other hand, CLS can also be understood as an attempt to employ computers so that entirely new questions can be asked of literature. Computational methods can often unveil patterns in literary data that remain hidden to the scrutiny of the individual reader. In this view, the aim of CLS is not to empirically test the claims we make as individual scholars, but to employ computers to make new claims that are more or less independent of individual observation. In such research, the lack of transparency offered by machine learning models is not necessarily perceived as a problem.

The analysis offered in this paper falls within the first category: we used computation to test a specific literary hypothesis about the texts. As such, our observations and findings are necessarily limited by the humanness and subjectivity of our perceptions, but they are also easily contextualized and checked against evidence that is findable in the texts. Discovering that the combination of “hard” and “he” occurred only five times in the *Twilight Saga* is interesting in this regard; the rich layers of meaning—sexual tension and attraction, but also the otherness of the vampiric body—conveyed in these phrases was one of the starting points for our analysis. In computational terms, however, five co-occurrences of words are hardly representative of a pattern. The human observation that initiated our analysis and the computational methods we employed in our analysis are thus at odds in terms of their focus: while human analysis picks up on intertexts, references, and associations, computational analysis, at least currently, gains scale at the expense of detail. To answer the research questions we started with, we may need tools better attuned to the subtleties of narrative text and interpretation.

But the answer here may not be the mere platitude “we need better tools.” We do, but there is a more fundamental methodological reflection to be made. The current epistemic of computational literary studies seems to assert that meaning is in the text alone. The state-of-the-art reasoning—which we have relied on in this paper—seems to be: “If we can quantify the relation between the elements of a text’s vocabulary precisely enough, that will tell us how one text portrays a theme, topic, or motif—in our case, sex—differently from another.” It is obvious to any conventional literary scholar that this is not how readers and literary scholars come to know (the meaning of) texts. Instead, context is key. The ways in which a particular text evokes a particular motive and meaning depend on the cultural background of its readers, which implies that readers in different cultures may understand the same text vastly differently.

We are surprised to find little interest in the CLS community so far in addressing this challenge. An urgent and critical question for understanding literature computationally seems to be: how do we factor the various backgrounds of readers into the question of how understanding and interpretation come about in reading a text? Instead, much of the research in CLS keeps counting and modelling more words, often concluding, as we have done here, that counting does not account for meaning.

Since we have faith in proxy-based CLS research, why do we limit this process to the elements of the texts themselves? We began this paper with a description of how differing readerly communities and contexts of publication led to a conflict in the publication journey of our case study, from fanfiction to international bestseller. We then turned to the texts themselves to investigate this development. In future work on adaptation, it seems prudent to take the shifting community context into account throughout the research process. Considering and measuring the shifting contexts of reading and writing may be a good way for CLS to include in its research what literary scholars have long known about how texts come to mean.

6.2 Conclusion

We draw four conclusions. First, Piper’s five-step plan for literary modelling is a useful way of structuring a computational approach to literary adaptation. Second, using adjectives, verbs, and adverbs as a proxy for shifting characterization yielded meaningful results, although the shifts detected in this case study were minimal: the uneven power dynamic between the protagonists remained intact. Third, using sex-related terms as a proxy for the shifting level of sexual explicitness in these texts did not yield meaningful results. It remains difficult to detect erotic tension in these texts through computational means, especially since eroticism remains largely subtextual

in them and current computational tools are often not equipped to detect subtext. The development of methods and tools to operationalize these subtextual meanings is an interesting avenue for future research in computational literary studies.

Most of the analysis presented in this paper revolves around an assumed binary opposition between subjectively interpretable and computationally measurable dimensions of both texts and textual adaptation. Based on this division, we concluded that the overlap between these two modes of interpretation is limited. In other words, the computational tools we have applied here could not detect sufficient evidence to support our subjectively formulated hypotheses. However, we would not be humanists if we did not take this opportunity to deconstruct a binary. Our findings suggest that the distinction between the qualitative and the quantitative, the human and the computational, the subjective and the measurable, are not as clear-cut as our research setup initially assumed.

In an insightful 2023 article, Katherine Bode writes that researchers in CLS “persist in aligning meaning with human subjectivity and presenting computation as other—and lesser—than literary phenomena” (Bode 2023, 519). We do not intend to fall into that trap here. Our subjective reading of these texts does not align with our computational findings in every regard. This suggests that computational and more traditional literary studies do not exist in fully overlapping epistemological spaces. While the two can and should be understood as supporting and refining each other, using computation in an attempt to prove human intuition oversimplifies their relationship.

As we have seen, a collocation that occurs as infrequently as five times can stand out to a human reader as significant to the interpretation of a 500-page novel. At the same time, from a computational viewpoint, a collocation this (in)frequent cannot be expected to point to a statistically significant pattern. In CLS, it has been observed before that “seemingly meaningful results” are not always “statistically sound” (Schöch 2023, 379). Similarly, in this paper we detected a clash between statistical and more traditionally hermeneutic methods. In other words, we find that (statistical) null results may still lead to (interpretively) useful findings in the field of CLS.

In studying textual adaptation, cultural and societal context and reception are another important dimension that we may have oversimplified here, because it is largely outside of the scope of the current paper. Nonetheless, we contend that both the changes made when *Twilight* was adapted into *Fifty Shades*—shifting characterization and adaptation of non-explicit and lexically limited descriptions of sex—contribute

to its publishability as original fiction. Additionally, financial interests appear to be the determinant factor that facilitates the change of status from fanfiction to novel text. By reproducing the Twilight Saga's subtextual and non-explicit representation of sexuality and shifting its characters to a different storyworld, Fifty Shades aligned itself with the subgenre of "mommy porn." This made the trilogy appealing to a wide audience of adult readers who might otherwise not have engaged with the text, thus making the adaptation profitable to its author and publisher.

Competing interests

The authors have no competing interests to declare.

Contributions

Authorial

Authorship in the byline is by magnitude of contribution. Author contributions, described using the NISO (National Information Standards Organization) CrediT taxonomy, are as follows:

Author name and initials:

Julia Neugarten (JN)
Barbara Bordalejo (BB)
Joris J. van Zundert (JVZ)

All authors have read and agreed to the published version of the manuscript. Authors are listed in descending order by significance of contribution. The corresponding author is JN.

Conceptualization: JN, BB, JVZ
Computational analysis: JVZ
Research design: JN, BB, JVZ
Formal Analysis: JN, BB, JVZ
Investigation: JN, BB, JVZ
Writing – Original Draft Preparation: JN
Writing – Review & Editing: BB, JVZ
Project Administration: JN

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