The Impact of COVID-19 Restrictions on Book Consumption

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Management Summary

The outbreak of the COVID-19 pandemic has had a major impact on consumer habits and behavior. Prior research has already shown that increases in free time and a desire to escape from daily live during the pandemic resulted in consumers spending more time on book reading. Nevertheless, given the high impact of COVID-19 restrictions on consumer behavior, book consumption may have changed in many more ways. Therefore, our research makes an important contribution to the existing literature by investigating not only the impact of COVID-19 restrictions on the amount people read, but also how the pandemic has impacted consumers' reading speed, evaluation of books and types of books read and how these effects vary across age groups, genders, types of readers and nationalities.

To investigate the impact of COVID-19 restrictions on book consumption, we use data scraped from the reading community website Goodreads. We collected 18,252,877 book reading records from 112,087 unique Goodreads users that were found via the 31 largest country-specific subgroups on Goodreads. Our dataset covers the consumption of books over a 15-year timeframe, including almost two years after the outbreak of COVID-19. This allows to identify both short-term reactions to the pandemic and longer-term effects on book consumption. In our study we construct linear regression models in which we analyze the impact of varying country-specific lockdown policies on the consumption of books.

Our results illustrate that during stringent COVID-19 measures, people typically read more books per week, finish books in a smaller amount of days and read longer books. Furthermore, we provide evidence that female readers relatively start to read more books than men during restrictive COVID-19 periods, while male readers increase their reading pace more than female readers. Moreover, the results of our study indicate that especially younger people start to consume more books during periods of COVID-19 measures, while older readers start to read longer books. Additionally, our results show that during the pandemic less fanatic readers show a stronger increase in book reading than more fanatic readers and that changes in book consumption during restrictive periods vary strongly across countries.

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1. Introduction

The outbreak of the COVID-19 pandemic has had a major impact on public healthcare systems worldwide (World Health Organization, 2022). To limit the spread of COVID-19, most countries introduced far-reaching restrictions. While these restrictions were often effective in containing the spread of the virus (Bo et al., 2021), they caused serious problems for many businesses. For example, airlines, hotels, restaurants and brick-and-mortar retail stores faced a steep decline in customers, and some consequently went bankrupt (BBC, 2020). Although the pandemic threatened many companies, new business opportunities also arose as a result of it (Liu, Lee & Lee, 2020). Pharmaceutical companies saw their stock prices rise at an unprecedented pace, and online stores profited greatly from an increase in online shopping. Moreover, the use of online media such as music videos, games and social networks increased significantly during lockdown periods (e.g., Eger et al., 2021; Sim et al., 2022).

The rise in online media consumption suggests that the COVID-19 restrictions may have also impacted book consumption. Increases in book sales during the pandemic support this idea (Whiting, 2021). Likewise, prior research has found that the pandemic has had a positive impact on the amount of time people spend reading. However, since book consumption still mainly takes place offline (Handley, 2019), it is not as easy to track as online media consumption. Consequently, the existing literature on the impact of COVID-19 restrictions on book consumption is limited. Currently, this stream of literature consists of survey studies that rely on self-reported changes in book reading and focus exclusively on the time spent on reading. Nevertheless, given the high impact of COVID-19 restrictions on consumer behavior, book consumption may have changed in multiple ways. For example, people could have started exploring different types of books than they would normally read due to a shift in interest or an increase in free time. The negative impact of lockdowns on consumers' mental health and wellbeing may have caused book readers to be more negative when evaluating books, resulting in lower book ratings. While the pandemic, on the one hand, has led to an increase in reading time, on the other hand consumers may read more slowly during lockdowns, due to an inability to concentrate due to worries about the pandemic. Therefore, our research makes an important contribution to the existing literature by investigating not only the impact of COVID-19 restrictions on the amount people read, but also how the pandemic has impacted consumers' reading speed, evaluation of books and types of books read.

Moreover, as the pandemic did not affect everyone to the same extent, it is also likely that the impact of COVID-19 measures on book consumption differed for different groups of

people. For example, while most people saw an increase in free time to spend on reading, it could be that parents who had to homeschool young children had less time to spend on reading. People who were already more engaged with reading may have shown a different change in reading behavior than less-engaged readers. Furthermore, the fact that women are generally more engaged with book reading (McGeown, 2015; Schaffner et al., 2013) implies that the change in their reading behavior during lockdowns might differ from that of men. Additionally, since COVID-19 restrictions differed across countries, it is likely that the pandemic's impact on book consumption differed across countries. In the current literature, this heterogeneity effect remains mainly unexplored. Our research therefore also contributes to the existing literature by investigating whether the changes in book consumption during the pandemic varied across age groups, types of readers, genders or nationalities.

Furthermore, this research is relevant from a societal perspective. According to Hisgen and van der Weel (2022), reading is an important foundation of modern societies. Democracy, law, education and sciences are built on reading. Moreover, reading provides access to knowledge and improves critical thinking, learning, wellbeing and mental health. Nevertheless, research has shown that book reading has been decreasing for years (Hisgen & van der Weel, 2022). Hence, determining how COVID-19 measures have impacted book consumption is, for example, beneficial for public institutes to know if the pandemic affected the downward trend in book reading or for organizations to gain insight into what motivates or demotivates people to read books. Knowing how COVID-19 measures impact the behavior of book readers might also be relevant for businesses. According to research of Deloitte (2020), companies that manage to quickly adapt their marketing activities to new COVID-19 situations will have a significant competitive advantage. Hence, stakeholders in the book industry that want to effectively respond to new COVID-19 restrictions could highly benefit from the outcomes of our research. For example, if lockdowns lead to increased book consumption, book stores might want to increase book promotions. Moreover, book publishers and writers might want to know if corona measures could impact the demand of new book releases and adjust the time of release accordingly. Hence, our study could also be interesting for multiple parties involved in the book market, such as book writers, publishers, book sellers, libraries and book clubs.

To investigate the impact of COVID-19 restrictions on book consumption, we use data scraped from the reading community website Goodreads. On this website, users track the books they have read, when they read these books and how they rate them. This data is accessible via the individual user's webpage, which is called the "bookshelf". The information from these

bookshelves provide insights into reading behavior that sales data from websites such as Amazon and Bol.com do not capture. For the purpose of this research, we collected the bookshelf data of 112,087 Goodreads users that were found via the 31 largest country-specific subgroups on Goodreads. These subgroups enable the direct link of each user to the country where they most likely live. This is useful, as COVID-19 measures typically differ across countries. The stringency index of the Oxford Covid-19 Government Response Tracker (OxCGRT) operationalizes the 'COVID-19 measures' variable in our study. This index aggregates the stringency of eight frequently used containment and closure policies and the presence of COVID-19 information campaigns into a single number, ranging from 0 to 100 (Hale et al., 2021). The index is available for 187 countries during the pandemic. The relationship between the OxCGRT stringency index and book reading behavior in the sample data are examined with the use of regression analysis.

The remainder of this thesis is organized as follows. First, Chapter 2 presents existing literature that describes the impact of COVID-19 on media consumption. Chapter 3 formalizes the expectations for results. Chapter 4 describes the data used for analysis. Next, Chapter 5 explores and visualizes the data. Chapter 6 introduces the model used for analysis and Chapter 7 present the results of this analysis. Finally, Chapter 8 discusses the results and conclusions.

2. Literature Review

This chapter reviews the existing literature on the impact of COVID-19 on media consumption. This thesis specifically focuses on the impact of COVID-19 measures on book consumption, but the existing literature on this topic is limited. By examining the broader stream of literature on the relationship between COVID-19 and media consumption, we intend to identify shifts in consumption behavior that could also apply to the impact of COVID-19 restrictions on book consumption.

2.1 The React-Cope-Adapt Model

Since the outbreak of the COVID-19 pandemic, multiple studies have found that COVID-19 has highly impacted consumer habits and behavior (e.g. Balhara, et al., 2020; Kumar & Dwivedi, 2020). The majority of these studies focus on how the pandemic led to panic buying, how consumption is used as a coping mechanism or how adapting to COVID-19 restrictions caused a shift in what is being consumed. Kirk and Rifkin (2020) attempt to explain all three phenomena by applying Hamilton, Mittal, Shah, Thompson and Griskevicius's (2019) resource scarcity framework to the pandemic. This framework, also referred to as the react-

cope-adapt (RCA) model, describes three stages consumers go through after being confronted with a constraining situation. The remainder of this chapter divides the current literature on the impact of COVID-19 on consumers into three distinct streams using this framework. For each stream, we synthesize what is known and what is not yet known.

2.2 Panic Buying

The first stage of the RCA model is the immediate reaction to the constraint. According to Kirk and Rifkin (2020), panic buying (i.e., hoarding) at the start of the pandemic corresponds to this immediate reaction stage. That the pandemic led to panic buying is supported by a broad range of literature (e.g. Hall et al., 2021; Islam et al., 2021; Kirk & Rifkin, 2020; Naeem, 2021; Laato, Islam, Farooq & Dhir, 2020). This stream of literature has shown that the uncertain situation caused by the outbreak of COVID-19 triggered consumers to start panic buying.

While this stream of literature clearly explains the impact of the coronavirus on consumers in the earliest stage of the pandemic, it does not address how COVID-19 has affected consumers in the long term. Moreover, as no evidence exists that panic buying played a role in media consumption, this research does not address the effects of the pandemic on media consumption. Hence, this stream of literature is not useful for parties that seek to gain insights into the short- and long-term effects of COVID-19 on media consumption.

While our study does not focus on panic buying, it does investigate both the immediate and long-term effects of the pandemic. Our dataset covers the consumption of books over a 15-year timeframe, including almost two years after the outbreak of COVID-19, which allows to identify both short-term (i.e., panic) reactions to the pandemic and longer-term effects on media consumption. Especially since our data captures multiple COVID-19 outbreak waves worldwide, our study adds to this stream of literature by investigating whether consumers showed similar reactions to later pandemic peaks as during the first coronavirus wave. This is an important contribution, as it provides evidence as to whether findings from studies about the first COVID-19 wave in early 2020 are generalizable to later peaks of the pandemic.

2.3 Consumption as Coping Mechanism

The second stream of literature about the impact of COVID-19 on consumers investigates how people use consumption as a coping mechanism during the pandemic (e.g. Garfin, 2020; Liu, Xia and Lang, 2021; Vanderbruggen et al., 2020; Rehm et al., 2020). Kirk and Rifkin (2020) connect this stream of literature to the second stage of the RCA model (i.e., coping). During this stage, consumers apply coping strategies to handle a constraining situation.

Kirk and Rifkin (2020) link an increase in the use of online communication software to stay in touch with friends and family and the strong increase in the adoption of domestic animals to this phase. The strong increase in alcohol, tobacco and cannabis consumption, as reported by Vanderbruggen et al. (2020), arguably relates to the coping phase, as well.

Additionally, a broad range of literature describes how media consumption serves as a coping mechanism during stressful times (e.g. Guthrie, Fosso-Wamba and Arnaud, 2021; Mathur et al., 1999; Mathur et al., 2003). Pre-COVID-19 research by Anderson et al. (1996) and Reinecke and Eden (2016) describes how people turn to media consumption to cope with stressful situations. In such situations, media consumption provides a form of escapism, as it offers a distraction from daily life stressors (Henning & Vorderer, 2001; Kubey & Csikszentmihalyi, 1990; Moskalenko & Heine, 2003).

Several researchers have found that media consumption has been used as a coping mechanism during the COVID-19 pandemic. For example, Eden, Johnson, Reinecke and Grady (2020) report a direct link between stress and anxiety during the pandemic and an increase in media use as coping strategy. Moreover, in several survey studies about media consumption, respondents indicated that they used book reading or gaming to escape daily life and cope with COVID-19 lockdowns (Adeyemi, 2021; Barr & Copeland-Stewart, 2022; Javed, 2020; King et al., 2020; Magadan-Diaz & Rivas-García, 2021).

Another body of literature within this stream of research reported consumers' increased interest in older and nostalgic media during the pandemic (Huang & Fishbach, 2021; MRC Data, 2020; Yeung & Yu-Cheong, 2020). This is explained by Spaid's pre-COVID-19 research (2013), which states that an increased interest in nostalgic products during difficult times is caused by consumers longing for an idealized past. The increased interest in older media during the pandemic is therefore a form of escapism and coping as-well.

While this stream of literature provides a longer view on the impact of COVID-19 than the literature related to panic buying, it focusses exclusively on the effects in the first wave of the pandemic and hence does not provide evidence that coping also plays a role in later waves. By comparing changes in (nostalgic) book consumption during the first wave of COVID-19 restrictions to the changes in later waves, our study assesses whether consumer's responses are similar. This is an important contribution to this stream of literature, as it is the first time that it is being investigated if findings from the first COVID-19 wave can be generalized to what happened during later waves of the pandemic.

Secondly, the nature of our data provides another important contribution to this stream of literature. Since the findings within this stream of research mainly rely on survey studies, they are typically based on retrospectively self-reported changes in behavior. Especially when respondents are asked to self-report changes in their behavior retrospectively, recall bias is a risk (Prati, 2017). By investigating book reading records from Goodreads over time, our study does not rely on respondents remembering how their behavior changed during the pandemic. Moreover, as the existing stream of research relies on data obtained after the outbreak of the pandemic, it does not allow to reliably compare consumption behavior from before and after the pandemic. Our study therefore tests whether the findings from the survey studies within this existing stream of research are also robust when tested with a different approach.

2.4 Shift in Consumption

The final stream of literature related to the impact of COVID-19 on consumers investigates how adapting to COVID-19 restrictions has caused a shift in what is consumed. This stream of literature examines, for example, the increase in online consumption and home-based recreational activities and the decrease in consumption of gasoline and traveling (e.g. Hall, Prayag, Fieger & Dyason, 2021; Sheth, 2020; Zwanka & Buff, 2021; Kim, 2020). This stream of literature is linked to the final stage of the RCA model, in which consumers adapt their consumption behavior to the constraint (Kirk and Rifkin, 2020).

As mentioned previously, coping has caused an increase in media consumption during the pandemic. Besides coping, research has found that adapting to COVID-19 measures and the additional free time during lockdowns was another important reason for consumers to increase their media consumption (Boucher, Harrison and Giovanelli, 2020; MRC Data, 2020; Reid, 2020). In fact, in their study on increased gaming among US citizen during lockdowns, Barr and Copeland-Stewart (2020) found that additional free time was the most important driver for this increase. Within this stream of literature, a broad range of survey studies have found that respondents adopted to the pandemic by spending more time on the consumption of gaming (e.g. Ahmed, 2020; Barr & Copeland-Stewart, 2022), video streaming (e.g. Eden, Johnson, Reinecke & Grady, 2020; Krejčí & Staňková, 2021; Madnani, Fernandes & Madnani, 2020; Nielsen, 2020), social media usage (e.g. Chakraborty, Kumar, Upadhyay & Dwivedi, 2021; Chauhan & Shah, 2020; Kim, 2020) and book reading (e.g. Adeyemi, 2021; Magadan-Diaz & Rivas-García, 2021; Parikh, Vyas & Parikh, 2020). Some studies have also found that respondents started to consume different types and genres of media than they would typically consume. In their study on reading behavior during lockdown, Boucher et al. (2020) found that

respondents started to explore books they would normally not read. According to Barr and Copeland-Stewart (2022), consumers started to explore games that they normally would not play. In their study, respondents often motivated this shift by stating that they now had the time to explore different types of games. Charm, Coggins, Robinson and Wilkie (2020) report that the pandemic has highly decreased consumer loyalty, which resulted in consumers exploring new media genres.

While most studies in this stream of literature report a general increase in media consumption during the pandemic, Boucher et al. (2020) note that an increase in reading was only mentioned by two-thirds of respondents to their survey, while one-third of respondents indicated that they read less during lockdowns. Most of these respondents stated that this was a consequence of reduced commuting or having to homeschool their children.

Moreover, several studies on the effect of COVID-19 on music listening found that music consumption decreased during the pandemic (MRC Data, 2020; Roese & Merrill, 2021; Sim et al., 2022). Sim et al. (2022) link this to the decrease in commuting time caused by lockdowns and emphasize that music is often used as a complementary good during travel. Hence, the decrease in commuting time immediately led to a decrease in music listening time. MRC Data (2020) and Sim et al. (2022) found that an increase in other entertainment options at home also amplified the decrease in music consumption. MRC Data (2020) reported that 47% of respondents who reduced music listening during lockdowns spent more time on other forms of media instead. Moreover, Sim et al. (2022) found that despite the decrease in music listening, the consumption of online music videos increased.

While researchers initially suggested that the changes in media consumption might persist (MRC Data, 2020; Madnani et al., 2020; Sheth, 2020), studies by Weissbrot (2020), Krejčí and Staňková (2021), Magadan-Diaz and Rivas-García (2021), Sim et al. (2022) and Yeung and Yu-Cheong (2020) have found that media consumption gradually returned to normal after a relief in restrictions. Moreover, Sim et al. (2022) found that the changes in media consumption are strongly correlated to the stringency of the implemented measures and less correlated to the number of COVID-19 cases. This supports the idea that changes in consumption behavior due to COVID-19 are generally transient and dependent on pandemic-related restrictions. This reasoning is supported by Yeung and Yu-Cheong (2020), who found that the stringency of measures were a better predictor for a change in music consumption than was the COVID-19 incidence rate.

2.5 Summary

In conclusion, there seems to be consensus in the literature that COVID-19 has led to an increase in the consumption of all media except music. Moreover, coping and additional free time are considered to be the key motivations for people to change their media consumption. Nevertheless, the existing academic research is limited. Only Sim et al. (2022) and Yeung and Yu-Cheung's (2020) studies on music listening do not rely on self-reported consumer data. All other academic literature assessed the impact of COVID-19 on media consumption by asking survey participants if they perceived a change in their behavior. Hence, the insights from this stream of literature typically suffer from a risk of recall bias (Prati, 2017). As mentioned previously, by investigating book reading records from Goodreads over time, our study does not rely on respondents remembering how their behavior changed during the pandemic. We hence contribute to this stream of literature by demonstrating whether the survey findings in this stream are robust when tested with a different method.

Another important limitation of existing literature is that the majority only investigates time spent on media consumption. Hence, these studies do not address the effect that COVID-19 could have had on other constructs, such as the quantity of media consumed and the level of satisfaction with the consumption. While evaluations of media sales data provide evidence for changes in quantity consumed, such data does not capture how the media is consumed after the sale. Nevertheless, given the high impact of COVID-19 on consumer behavior, it is assumed that consumers not only changed the time spent on media consumption and the quantity they consume, but also the pace in which they consume media, how they evaluate media and what genres of media they consume. Hence, our research makes another important contribution to the existing literature by examining the impact of COVID-19 restrictions on book consumption in the form of not only reading quantity, but also reading speed and appreciation and how this may vary for different book types. Moreover, our study tests the heterogeneity of these effects, which the majority of research within this stream does not.

Lastly, also the final stream of literature solely focuses on the effects of COVID-19 in the first wave of the pandemic. Hence, it does not provide evidence that consumers changed their media consumption in the same manner during later waves of COVID-19 measures. Our research makes another important contribution to this existing stream of literature, as it will be the first study that investigates if findings from the first COVID-19 wave can be generalized to what happened during later waves of the pandemic. In table 1, the contribution of this paper to existing literature is visualized.

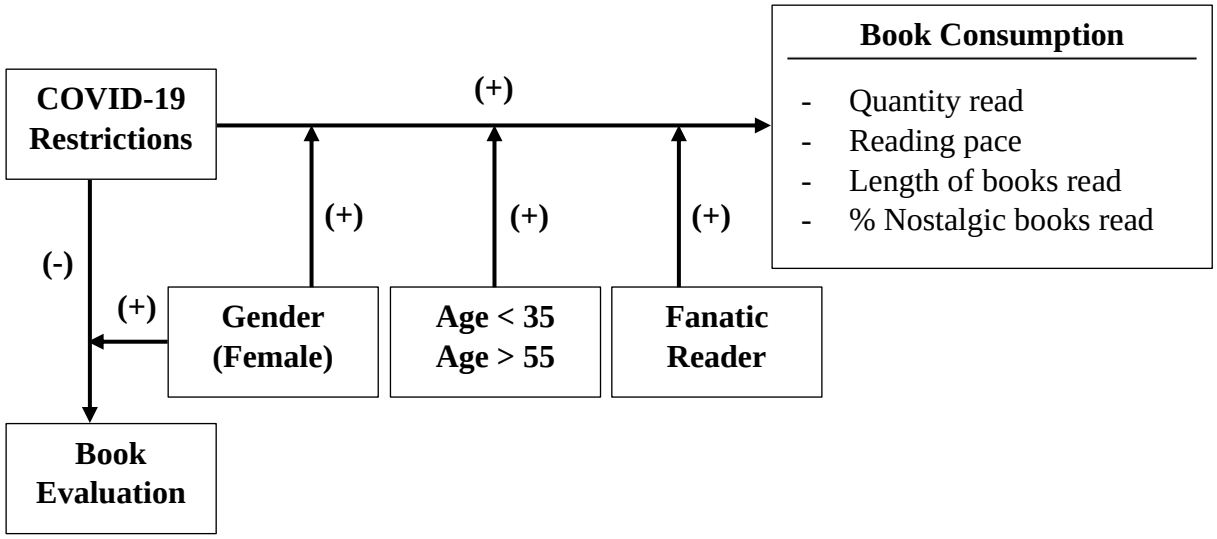
Table 1: Positioning of this Study Compared to Current Literature on the Impact of COVID-19 on Media Consumption

Article	Effect of	Effect on	Population	Data Collection	Single/Multiple COVID-19 Waves	Method of Analysis
Offline and online media						
Reid (2020)	Lockdowns	Spending free time	Canadians	Questionnaire	Single	Descriptive statistics
Qasim, et al. (2021)	Lockdowns	Spending free time	Retired Pakistani	24-hour time diary	Single	Descriptive statistics
Eden et al. (2020)	Virtual Education	Media for coping	US Students	Questionnaire	Single	Regression analysis
Online media (general)						
Sun et al. (2020)	COVID-19	Internet use	Chinese citizen	Questionnaire	Single	Descriptive statistics
Madnani, et al. (2020)	Lockdowns	OTT media use	Indian citizens	Questionnaire	Single	Regression analysis
Chauhan and Shah (2020)	COVID-19	Online media consumption	Indian citizens	Questionnaire	Single	ANOVA
Lemenager et al. (2021)	COVID-19	Online media consumption	German adults	Questionnaire	Single	Paired samples t-tests
Social media						
Chakraborty et al. (2021)	Social Distancing	Social media use	Indian citizens	Questionnaire	Single	Structural Equation modeling
Gaming						
Barr & Copeland-Stewart (2022)	Lockdowns	Gaming	US citizens	Questionnaire	Single	Qualitative analysis
Music listening						
Roese & Merrill (2021)	Lockdowns	Music listening	German adults	Questionnaire	Single	Regression analysis
Sim et al. (2022)	Incidents + Restrictions	Music (video) streaming	Global	Spotify top 200, YouTube API	Single	Regression analysis
Yeung &Yu-Cheung (2020)	Lockdowns	Nostalgic music listening	European citizen	Spotify top 200	Single	Regression analysis
Reading						
Parikh, et al. (2020)	Lockdowns	Reading habits	Indian students and university staff	Questionnaire	Single	Descriptive statistics
Adeyemi (2021)	Lockdowns	Reading habits	Nigerians	Questionnaire	Single	Descriptive statistics
Magadan-Diaz & Rivas-García (2021)	Restrictions (General)	Reading habits	Spaniards	Questionnaire	Single	Descriptive statistics
This thesis	Restrictions	Book consumption	Global	Web scraping	Multiple	Regression analysis

3. Conceptual Framework and Expectations

Figure 1 presents the conceptual framework for our research. The following sections discuss this framework in detail.

Figure 1: Conceptual Framework



3.1 Effect of COVID-19 Restrictions on Quantity, Reading Pace and Satisfaction

Due to the severe stress of the COVID-19 pandemic on national healthcare systems, governments worldwide imposed stringent measures on the mobility of their populations (Bo et al., 2021). An often-used measure in many countries was the stay-at-home order, also referred to as lockdown. These lockdowns obliged residents to only leave their house for essential tasks (e.g., grocery shopping) or work in essential businesses (e.g., healthcare). As a result, people spent an increased amount of time at home during lockdowns. Moreover, people typically saw a significant increase in their available free time for two important reasons. First, many people no longer had to commute to work since they were working from home (Sim et al., 2022). Second, a great deal of out-of-home activities had to be cancelled during lockdowns, as they were no longer allowed. Since book reading is a typical recreational activity one conducts from home, it was an activity people spent their additional free time on during the pandemic (Adeyemi, 2021; Magadan-Diaz & Rivas-García, 2021; Parikh et al., 2020). We expect that this increase in time spent on reading during lockdowns also caused people to read more books than they would normally read. Following this logic, we also expect that the increase in time spent on reading during lockdowns has resulted in people finishing books in fewer days, which implies an increase in reading pace.

The impact of COVID-19 on society has also highly affected people's mental health and overall wellbeing (e.g. Patrick et al., 2020; Rajkumar, 2020; Vindegaard & Benros, 2020). While the outbreak of the pandemic initially led to fear, anxiety and increased stress levels among vulnerable groups, extended lockdown periods and their effects on peoples' daily lives caused a broader group of people to suffer from feelings of loneliness and depression. One of the effects that this decrease in wellbeing might have had on book consumption is explained by the feelings-as-information theory. According to this theory, when people must evaluate a product or service, they are likely to reflect their current feeling in the evaluation, even when this feeling is unrelated to the product or service being assessed (Schwarz & Clore, 2007; Schwarz, 2010). Thus, it is likely that people were not able to separate their overall wellbeing and mood during the pandemic from how they perceived the quality of the products they consumed. Hence, drawing on the feelings-as-information theory, we expect that the decreased wellbeing of consumers during lockdowns has resulted in more negative book evaluations.

3.2 Influence of COVID-19 Restrictions on Different Types of Books

The increase in free time during the pandemic may have also impacted the kinds of books being read. For example, before the pandemic people may have frequently chosen to read shorter books if they felt that they could not finish longer books in a reasonable amount of time. Perhaps during the pandemic such readers found that they now had time to also read longer books. This could especially hold true for readers who are not willing to wait for a long time before finding out the denouement of a book. Still, worries about the pandemic and decreases in consumers' wellbeing led to some people suffering from concentration issues during lockdowns (Vyas & Tandel, 2020). Based on this finding, one could expect that people would be unable to read longer stories with sufficient concentration during lockdowns. As a result, such readers could be more likely to read shorter books during the pandemic. On the contrary, worries about the pandemic and decreases in consumers' wellbeing also made many people want to escape everyday life during lockdowns (Adeyemi, 2020). This longing for escapism might have made people more willing to read longer stories, as longer stories better allow readers to enter into a different world than shorter stories. When choosing which book to read, the increase in free time and the desire to escape daily life during lockdowns likely outweighed the desire to read shorter books due to one's decreased concentration. Hence, we expect that during lockdowns, consumers read longer books on average.

Moreover, the negative impact of the pandemic on peoples' lives resulted in many people longing for an idealized past during lockdowns (Huang & Fishbach, 2021; Yeung & Yu-

Cheong, 2020). People might associate older and more nostalgic books with "the good-old times". Therefore, they might find that reading nostalgic books helps their mind escape to those better times (Spaid, 2013). Accordingly, we expect that during the pandemic, older and more nostalgic books underwent a stronger increase in interest than more recent published books.

3.3 Exploring Heterogeneity

Not all age groups were equally affected by the COVID-19 pandemic. For example, older people typically faced a higher risk of severe disease than younger people. As a result, they were more concerned about the pandemic and adhered more strictly to the measures in place than younger people (McKeown, 2020). On the other hand, because many countries closed schools and universities, younger people were likely to suffer from concerns about their studies. Moreover, the closing of primary schools meant that younger children had to be homeschooled by their parents. Hence, during lockdowns many parents had to both work and homeschool their children. Consequently, the increase in free time that many people reported during lockdowns might not apply to those parents. Reid (2020) found that due to the obligation to homeschool children, most people aged between 35 and 54 did not significantly increase their time spent on reading during lockdowns, while people aged below 35 and people aged above 54 did. Building on this finding, we expect that book reading behavior in general changed more strongly for people below 35 and above 55 years old.

During the pandemic, people increased their media consumption (see Chapter 2). For many people, additional free time was an important motivation for this increase. When people have the choice between different types of activities, they are most likely to choose to spend their free time on the activity they enjoy most. Based on this reasoning, one could assume that when people gain additional free time, they are likely to spend this time on activities they were already likely to do (Lemenager et al., 2021). Therefore, we expect that people who were fanatic readers prior to the pandemic showed a stronger increase in book consumption than less-fanatic readers. Moreover, women on average read more than men and women show greater intrinsic motivation to read than men (Brozko et al., 2014; Coles & Hall, 2002; Logan & Johnston, 2009; McGeown, 2015; Schaffner et al., 2013). Following the same reasoning as for fanatic readers, we therefore expect that women showed a stronger increase in reading than men during the pandemic.

Globally, women were more affected by the social and economic effects of the pandemic than men. For example, they were at a greater risk of domestic violence, more often responsible

for homeschooling children than their partner and more often employed in economic sectors that were most affected by the pandemic, such as healthcare and hospitality (Vindegaard & Benros, 2020; Wenham et al., 2020). Women consequently suffered more from anxiety, depression and distress during the pandemic than men (Florence & Wijngaarden-Cremers, 2020). The wellbeing of women during the pandemic was thus more negatively affected than that of men. As previously explained, the feeling-as-information theory suggests that people who evaluate a product subconsciously reflect their feelings in this evaluation. We therefore expect that due to the stronger impact of COVID-19 on the wellbeing of women, the decrease in book rating during the pandemic was stronger for women than for men.

4. Data

4.1 Institutional Context

Goodreads is the world's largest book reading community, with 125 million registered users as of 2022 (Goodreads, 2022). The website was launched In January 2007. In March 2013, it was announced that Goodreads would be taken over by Amazon later that year (Kaufman, 2013). By then, Goodreads had acquired 16 million users worldwide. In 2022, Goodreads receives 45 million unique visitors per month and a total of 3.5 billion books have been added to user bookshelves (Goodreads, 2022). To examine the impact of COVID-19 restrictions on book consumption, we collected book reading data from 112,087 Goodreads users. These user accounts were found via 31 country-specific subgroups on Goodreads.

Goodreads allows users to rate and review books, track the status of their readings, search for books, find what friends are reading and connect with others via topic-specific subgroups. Documenting and rating readings occurs on the user's bookshelf, which displays an overview of previously read books, including the reading period, review score and book-specific information. This bookshelf is viewable by others if the user's profile is set to public or if a connection is made with the user. In this study's sample, 81.5% of users have a publicly available bookshelf. These publicly available bookshelves offer a unique opportunity to study the long-term impact of COVID-19 restrictions on book consumption. While the existing survey studies on the impact of COVID-19 rely on retrospectively self-reported changes in behavior, the book reading records on Goodreads do not rely on people remembering how their behavior changed during the pandemic. This makes the Goodreads data a more trustworthy source of information to compare behavior from before and after the pandemic than data on this topic collected via survey research.

4.2 Data Collection

To collect the data in this study, we use a Python web-scraping program that automatically connects to the Goodreads website with Python's "requests" package. After downloading the HTML code of the Goodreads webpages with the Python requests package, the scraped data from each page is transformed into a useful list of information using the "beautifulsoup" Python package. Before scraping the data, we made a list of the 31 largest country-specific subgroups that are active on Goodreads found under the "Groups > Geography" tab on the Goodreads homepage. To the best of our knowledge, the compiled list includes all countries for which a group with at least 100 members exists. While for many countries there are multiple groups on Goodreads, for each country our study only includes the group with the highest number of members. Typically, the largest group in each country has two to 10 times more members than the same country's second largest group. Scraping only the largest subgroup of each country led to a large number of users per country. The time required for scraping these 31 country-specific subgroups was limited to four months, which would have been significantly longer if all country-specific subgroups had been included.

The reason we chose to collect users via country-specific subgroups on Goodreads is two-fold. First, Goodreads does not provide an overview of all its members on its site. Member profiles are only accessible via other pages (such as the top-readers overview and the members tab under each subgroup) or via the search tab on the Goodreads homepage. While both the top-readers overview and the members tab under subgroups provide an easy way to access many user accounts at once, users in the top-readers overview are likely a biased group of Goodreads' most active members. Hence, the members tab under subgroups provides the ideal solution to collect the user pages of many users simultaneously. Secondly, collecting users via country subgroups immediately provides an indication of the country where each user lives. This is particularly useful for our research, as it allows us to match users to the country-specific COVID-19 pandemic measures they likely faced. Although members are free to join any subgroup on Goodreads, we found strong evidence that users typically only join one country group. In our dataset, less than 1% of users were found to be member of multiple groups from the list of countries studied. We thus assume that a user's country group is also most likely the country where the user lives.

When accessing the members list of a subgroup, Goodreads limits the number of members that can be viewed to 3,000. Nevertheless, by searching for letters and letter combinations within the group member list, we are able to retrieve almost all group members

of groups with more than 3,000 members. This process was automated with a Python while-loop that searched for letters and letter combinations until at least 99% of a group's members are collected and no new users are discovered. By scraping 31 country subgroups between January 1 and February 20, 2022, we collected 140,742 unique users' profile links.

After collecting the user profile links, we assess how many users have a private account, how many books each user has on their bookshelf and demographic information from the user's profile. Collecting this information took place from February 21 until March 12, 2022. In total, 13.9% of users have a private profile and 6.2% of users have zero books on their shelf. Since book reading information cannot be collected from these users, they are excluded from the remainder of our study. Hence, 112,403 users remain in our dataset (see Table 2). On a country level, the percentage of users that remain after removing private users and users with zero books lies between 70% and 88% of each country's members. Furthermore, the number of shelved books per user for each country is between 87.0 and 353.7. It seems that the number of books per user is higher for the developed countries in our dataset. Explanations for this could be that people in developing countries read less or that users in developing countries were later to join Goodreads and their bookshelves thus represent a shorter time span.

Table 3 presents the descriptive statistics of the variables collected from the 112,403 users in our dataset. Since only 32.1% of users reported their age and only 8.5% of users reported their gender on their user profile, for the majority of users, only their country is known.

After scraping the information from the user profile pages, we scraped the user bookshelves from March 13 to April 17, 2022. For 542 users (i.e., 0.48% of users), fewer books were on their bookshelves compared to when their user profile had been scraped. After re-running the scraper for these users, we found that 89 user profiles were no longer available. These users had either deleted their profile or set it to private during the observation period. For 227 users, the number of scraped books corresponded to the total number of books on their shelves when initially scraped. They had thus removed books from their bookshelf between the scraping of their profile information and their bookshelf. For the remaining 226 users, we re-scraped their bookshelf and subsequently added the correct number of books to the book list. After re-scraping, the dataset contains the bookshelves of 112,087 unique users, on which a total of 18,252,877 books are stored. Table 4 presents the bookshelf information scraped for each user, and Table 5 displays the raw summary statistics. In Table 5, it is clear that 58.8% of books have no date started and that 49.9% of books have no date finished. Furthermore, while

for 39.9% there is no date published, the year published is missing for only 6.0% of books. In addition, the majority of books have been rated by the reader, the rating is missing for only 13.5% of books. Moreover, infeasible minimal and maximum variable values exist, such as read dates in the future or in the year 23 A.D. These are addressed in the next step, data cleaning.

Table 2: User Profiles Collected per Country

Country	# Users Total	# Private Users	% Private Users	# 0-Books Users	% 0-Books Users	# Access-ible	% Access-ible	# Books Access-ible	# Books per Acce-ssible User
Indonesia	24,040	2,738	11.4%	3,318	13.8%	17,984	74.8%	1,643,722	91.4
Italy	16,210	1,773	10.9%	913	5.6%	13,524	83.4%	2,650,555	196.0
India	16,029	2,165	13.5%	1,122	7.0%	12,742	79.5%	1,236,486	97.0
Egypt	11,626	905	7.8%	887	7.6%	9,834	84.6%	868,745	88.3
Philippines	7,044	1,400	19.9%	224	3.2%	5,420	76.9%	957,309	176.6
UK	5,925	1,457	24.6%	191	3.2%	4,277	72.2%	1,139,590	266.4
Australia	5,800	1,489	25.7%	190	3.3%	4,121	71.1%	1,332,397	323.3
Mexico	5,552	763	13.7%	189	3.4%	4,600	82.9%	693,131	150.7
Portugal	5,129	860	16.8%	129	2.5%	4,140	80.7%	784,684	189.5
Lithuania	4,195	411	9.8%	103	2.5%	3,681	87.7%	456,841	124.1
Malaysia	3,642	469	12.9%	290	8.0%	2,883	79.2%	339,393	117.7
Romania	3,482	527	15.1%	113	3.2%	2,842	81.6%	455,993	160.4
Argentina	3,459	541	15.6%	87	2.5%	2,831	81.8%	445,792	157.5
Poland	2,943	323	11.0%	53	1.8%	2,567	87.2%	686,597	267.5
Turkey	2,824	266	9.4%	142	5.0%	2,416	85.6%	374,606	155.1
Pakistan	2,634	308	11.7%	248	9.4%	2,078	78.9%	197,878	95.2
Finland	2,588	362	14.0%	40	1.5%	2,186	84.5%	773,284	353.7
Sweden	2,403	367	15.3%	43	1.8%	1,993	82.9%	568,833	285.4
Norway	2,273	398	17.5%	24	1.1%	1,851	81.4%	468,825	253.3
Singapore	1,778	290	16.3%	40	2.2%	1,448	81.4%	269,311	186.0
Latvia	1,430	180	12.6%	16	1.1%	1,234	86.3%	205,879	166.8
UAE	1,411	176	12.5%	97	6.9%	1,138	80.7%	155,581	136.7
Netherlands	1,318	185	14.0%	47	3.6%	1,086	82.4%	270,954	249.5
Bangladesh	1,240	134	10.8%	77	6.2%	1,029	83.0%	238,728	232.0
Estonia	926	189	20.4%	13	1.4%	724	78.2%	174,474	241.0
Bulgaria	907	155	17.1%	27	3.0%	725	79.9%	175,295	241.8
Nepal	740	78	10.5%	40	5.4%	622	84.1%	54,137	87.0
Russia	688	84	12.2%	56	8.1%	548	79.7%	96,991	177.0
Venezuela	618	101	16.3%	22	3.6%	495	80.1%	85,180	172.1
Panama	347	66	19.0%	8	2.3%	273	78.7%	45,639	167.2
Austria	227	38	16.7%	4	1.8%	185	81.5%	58,285	315.1
In >1 group	1,314	349	26.6%	39	3.0%	926	70.5%	259,136	279.8
Total	**140,742**	**19,547**	**13.9%**	**8,792**	**6.2%**	**112,403**	**79.9%**	**18,164,251**	**161.6**

Table 3: Descriptive Statistics of Raw User Information

Variable	Description	Mean	Median	SD	Min	Max	Nr NAs
User ID	Unique ID of the user	-	-	-	-	-	-
Age	Self-reported age of the user	33.07	31.00	22.95	15	2,021	76,378
Gender (Male = 1)	Self-reported gender of the user, where 1 = male and 0 = female	0.43	0	0.495	0	1	102,818
Join Date	The month and year in which the user joined Goodreads	9–2014	1–2014	117.71 (days)	1–2007	2–2022	-
Last Active	The month and year the user was last active on Goodreads	5–2020	10–2021	995.93 (days)	7–2007	4–2022	-
Country	The country subgroup the user is a member of. If one is a member of multiple country groups, this variable is set to "unclear."	-	-	-	-	-	-
Books read	The number of books on the user's bookshelf	161.9	67.0	373.72	1	50,143	
Avg. rating	The average rating the user has given to the books on their shelf; this value ranges from 1 to 5	3.82	3.94	0.85	0	5	-

Table 4: Description of Information Scraped for Each Book

Variable	Description
Reader ID	The unique user ID of the reader
Book ID	The unique book ID of the book
Number of ratings	The number of times the read book has been rated by other readers
Average rating	The average rating score that the book received by other readers, ranging from 0 to 5
Number of pages	The number of pages in the book
Year published	The year the book was published
Date published	The exact date when the book was published
Date added	The system-generated date of when the user added this book to their read shelf
Date started	The optional user-added date of when the user started reading the book
Date finished	The optional user-added date of when the user finished reading the book
Rating	The rating score the user assigned to this book, ranging from 1 to 5

Table 5: Descriptive Statistics of Raw Bookshelf Data

Variable	Mean	Median	SD	Min	Max	Nr NAs
Reader ID	-	-	-	-	-	-
Book ID	-	-	-	-	-	-
Number of ratings	264,482	8,702	808,655.50	0	8,455,382	-
Average rating	3.93	3.970	0.3895	0	5	-
Number of pages	440.00	296.0	512,320	0	2.147*10^9	678,652
Year published	1981	2006	165.30	-2600	32,767	1,098,057
Date published	26-8-2001	1-1-2011	14453.18	1-1-0001	1-1-9155	7,283,276
Date added	12-6-2016	14-7-2016	2022.63	31-12-0100	23-4-2022	-
Date started	20-12-2017	10-6-2018	1506.03	7-9-0024	2-2-3645	10,730,188
Date finished	19-7-2019	31-1-2018	1740.89	18-7-0027	2-2-3645	9,103,731
Rating	3.80	4.00	0.9934	1	5	2,472,702

4.3 Data Cleaning

Next, outliers and infeasible information are removed from the dataset. Regarding readers' ages, one user's age is below 18, and 24 users have set their age above 99. As Goodreads automatically sets the profiles of underaged users to private, no users in the dataset should be under 18 years old. Therefore, we remove the user under 18 from the dataset, as well as those over 99, as it is assumed that people of such an advanced age are not likely to use Goodreads.

Start and finish dates that seem infeasible are also removed. The acceptable dates are limited to 70 years before Goodreads was founded (i.e., 1–1–1937) and until the last book was scraped (i.e. 5–5–2022). Moreover, 1,500 book reading records have a date finished before date started. As this information is unreliable, we remove the start and finish dates of these books. Additionally, the 322 books in the dataset for which the date added is before the launch of Goodreads are removed, as this is assumed to be a Goodreads error. All books with a publish date later than the date added are also removed, as this is another infeasibility.

Since the data scraping started on January 1, 2022, we remove all data from the dataset that was uploaded after this date to avoid collecting biased data for users that were scraped relatively early opposed to users that were scraped at the end of the scraping period. Next, book lengths that exceed 10,000 pages are removed from the dataset, as we assume that no book contains so many pages. Moreover, books that are indicated to have zero pages are also removed, as a book clearly cannot exist without pages.

On the first day a reader is active, they post an average of 22.75 books to their shelf, while on other posting days they add 2.48 books to their shelves. When one registers with Goodreads, the site asks you to enter all books you have read before. Hence, this might be the reason for the high number of books added on the first day of activity. Based on this finding, we decide to remove all books that each user added on their first day of activity. After this last step, our dataset contains 99,641 unique users and 14,848,487 book reading records.

4.4 Variable Operationalization

To analyze the change in book consumption, we operationalize the variables from the conceptual framework (see Table 6). These variables represent various aspects of book reading and are computed for the book reading records in the final dataset aggregated on a weekly level per user. Data is aggregated on a weekly level to remove the effect that different days of the week could have on book reading. Additionally, to operationalize the ‘COVID-19 restrictions’ variable, we use the OxCGRT stringency index. This index aggregates the stringency of eight frequently used containment and closure policies and the presence of COVID-19 information campaigns into a number between 0 and 100 (Hale, et al., 2021). The index is available for 187 countries for each day since January 1, 2020. For each week, we compute the average stringency score for all 31 countries in our study. For all weeks prior to January 1, 2020, the COVID-19 stringency index is set to zero.

Table 6: Variable Operationalization

Variable	Description
Quantity	
Number of books added	The total number of books added in a week by a user. For each user, this variable is computed for each week between their first and last activity.
Speed	
Number of days per book	The number of days it took on average to finish the books added to the shelf. The number of days per book is the number of days from date started reading to date finished reading. Hence, this variable is only based on the books for which both date started and date finished are available. This variable only includes books finished within one year, as we do not want to capture people starting to read a book again that they started years ago.
Satisfaction	
Average rating per book	The average rating of the added books in a week. This variable is only based on the books that were rated by the user.
Book Characteristics	
Percentage nostalgic books	The number of books with a publication year 10 to 80 years before the date added, divided by the number of books added in a week. This variable is only based on the books for which the publication year is available.
Percentage recent publications	The number of books with a publication date less than one year from the date added, divided by the number of books added in a week. This variable is only based on the books for which the exact publication date is available.
Number of pages per book	The average number of pages per added book. This variable is only based on the books for which the number of pages is recorded.

4.5 Summary Statistics Final Dataset

Table 7 presents the summary statistics of the final dataset, which are based on 99,641 users and 14,848,487 books.

Table 7: Summary of Statistics in Final Dataset

Variable	Mean	Median	SD	Min	Max	Nr NAs
Reader data						
User URL	-	-	-	-	-	-
Age	32.75	31	8.52	18	100	65,867
Gender (male)	0.43	0	0.49	0	1	90,770
Join date	8–17–2014	1-2-2014	1,167.63	1–1–2017	1-12-2021	-
Last active	8–23–2020	28-12-2021	910.39	7–28–2017	1-4-2022	-
Country	-	-	-	-	-	-
Books read	176.88	81	305.05	1	8,192	-
Books in data	149	60	278.77	1	7,940	-
Average rating	3.88	3.92	0.64	0	5	-
Book data						
Reader ID	-	-	-	-	-	-
Book URL	-	-	-	-	-	-
Number of ratings	207,939	7,256	676,674.10	0	8,455,382	-
Average rating	3.93	3.97	0.39	0	5	-
Number of pages	311.35	292	194.04	1	9,999	589,750
Year published	1,984.08	2008	143.35	-2600	2022	944,500
Date published	5–17–2003	10–4–2011	13,745.04	1–1–0001	5–3–2022	5,794,460
Date added	8–31–2016	11–5–2016	1,199.36	1–1–2007	12–31–2021	-
Date started	12–1–2017	5–8–2018	1,046.05	1–2–2007	4–22–2022	7,773,620
Date finished	8–29–2017	1–29–2018	1,110.50	1–2–2007	4–23–2022	6,406,381
Rating	3.77	4	0.99	1	5	1,995,456

Finally, Table 8 presents the summary statistics of the operationalized variables on the book record level.

Table 8: Summary of Statistics Operationalized Variables (on Book Record Level)

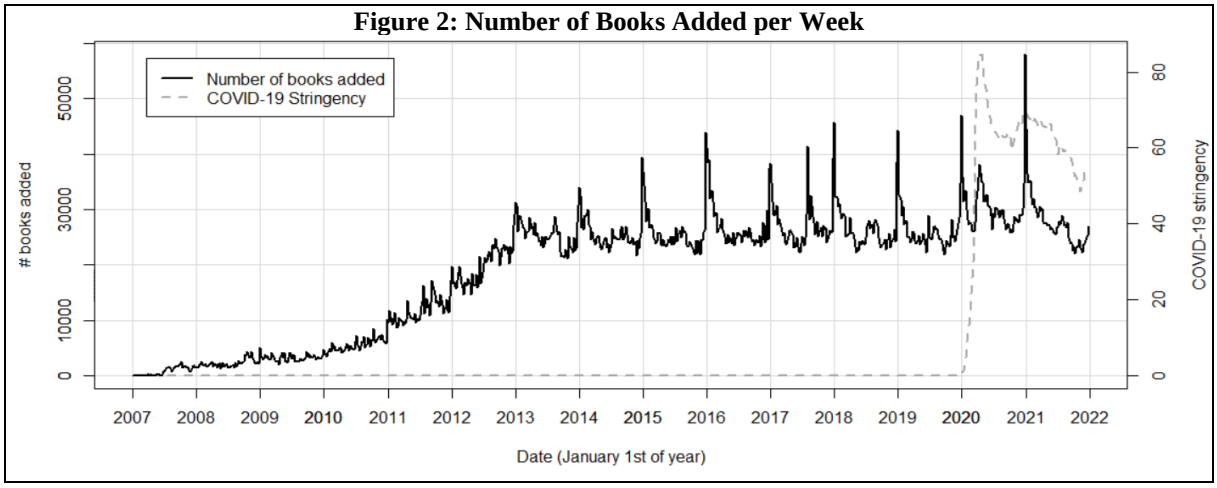
	Mean	Median	SD	Min	Max	Nr NAs
Quantity						
Number of books added per week	0.72	0.529	0.88	0.19	20.00	-
Speed						
Number of days per book	28.76	25.78	19.89	0	388.50	7,993,011
Satisfaction						
Average rating per book	3.73	3.75	0.123	3.22	5	1,995,456
Book Characteristics						
% nostalgic books	0.40	0.38	0.063	0	0.88	983,943
% recent publications	0.17	0.18	0.05	0	0.33	5,794,460
Number of pages per book	314.00	311.90	18.14	238.5	575.00	589,750

5. Model-free Analysis

5.1 Number of Books Added

In this chapter we analyze our final dataset on the weekly-aggregated level before fitting a model to the data. First, in Figure 2, we visualize how the total number of books added per week developed over time against the weighted average COVID-19 stringency index[1].

Figure 2: Number of Books Added per Week



As can be seen in Figure 2, between 2007 and 2013, the number of books added per week grew from 0 to 30,000 in an exponential pattern. After 2013, the trend of number of books added per week stabilized and started to behave in a seasonal pattern in which the total number of books added per week peaks each year around Christmas, after which it decreases until summer. During summer, the number of books added shows a slight increase until autumn. The increase in the number of books added during Christmas and summer is probably caused by an increase in available time during holidays. The fact that the Christmas increase is typically much stronger than the summer increase could be explained by the fact that pleasant weather during summer might motivate people to spend their holidays outside rather than inside with a

[1] The weights in this weighted average represent the total number of members from each country divided by the total number of members in the dataset. These weights are then multiplied with the average weekly COVID-19 stringency index in each country and summed. The resulting stringency index should represent the average stringency that all users in the dataset were confronted with during each week of the pandemic.

book. Obligatory stay-at-home periods could thus have the same effect on reading. This thought is supported by the peak in number of books added in April 2020. While book reading normally decreases in April, in April 2020, at the same time the COVID-19 stringency index reached its peak, the number of books added was significantly higher than most other periods except Christmas. Moreover, the Christmas peak in December 2020 is the highest Christmas peak in the data, which aligns with the second global peak in COVID-19 stringency. This is a first sign that both the first and second peak of COVID-19 measures led to an increase in book reading.

The exponential increase in number of books added between 2007 and 2013 is likely caused by the number of active Goodreads users increasing in that period. Due to this observation and the fact Amazon acquired Goodreads in mid-2013, the periods before and after 2014 are considered to be substantially different. Therefore, the remainder of this paper focuses exclusively on the data from 2014 onward. In addition, to control for fluctuations in the number of active users in this period, it specifically examines the number of books read per active user. Figure 3 therefore visualizes the number of books added per active user since 2014, compared to the weighted COVID-19 stringency index.

Figure 3: Number of Books Added per Active User

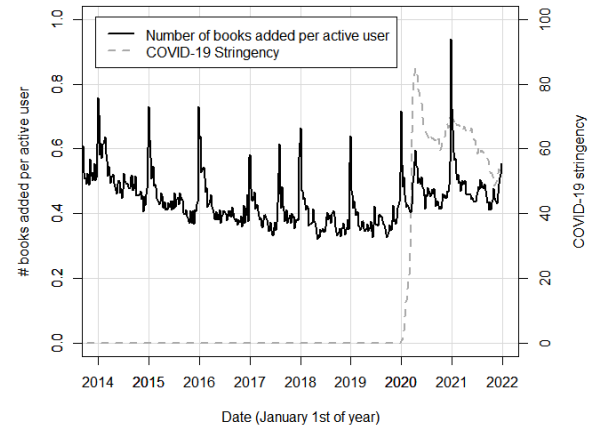
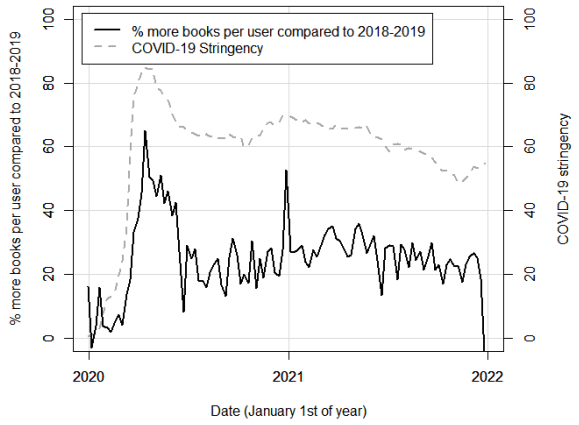


Figure 4: % Change in Books Added Per User



It is clear that the average number of books added per user shows the same seasonal pattern and COVID-19 peaks as the total number of books added. Before the pandemic, there was a slight decreasing trend in the number of books added per user. However, since the outbreak of the pandemic, the minimum level of books added per user was again at the level from prior to 2016. Moreover, during the pandemic, the number of books added per user typically moves in the same direction as the COVID-19 stringency index, which adds to the assumption that COVID-19 measures led to an increase in book consumption. This also becomes clear by looking at Figure 4. In Figure 4, we plotted the percentage change in number of books added per week during the pandemic compared to the average number of books added

during the same week in 2018 and 2019. It can be observed that from the start of the pandemic until December 2021 the number of books added per user was typically more than 20% higher than in the same week in 2018 and 2019. Moreover, it is clear that during the peaks of COVID-19 restrictions the percentage increase in number of books read per user is highest.

5.2 Reading Speed

Figure 5 identifies the average number of days a reader takes to finish a book. As this variable is based on all books finished within one year, the period between January 2021 and December 2021 does not include all books that are still potentially finished within one year, which explains the steep drop in the graph during especially the end of 2021. Therefore, for this specific variable, only the period between 2014 and 2021 is assessed in the remainder of our study. The average number of days to finish a book decreased from 2014 until 2017, after which it stabilized until the outbreak of the COVID-19 pandemic. This observation is partly explained by the fact that the length of books slightly decreased over the same time span (see Figure 7). Figure 6 shows the percentage change in days required to finish a book for each week in 2020 compared to the average number of days required to finish a book during the same week in 2018 and 2019. Both Figure 5 and 6 demonstrate a drop in the average number of days required to finish a book during the first year of the pandemic, while Figure 7 conveys no clear drop in the length of books during that period. This adds to our expectation that during the pandemic people were, on average, reading faster and finishing books in a shorter amount of time.

Figure 5: Average Number of Days per Book

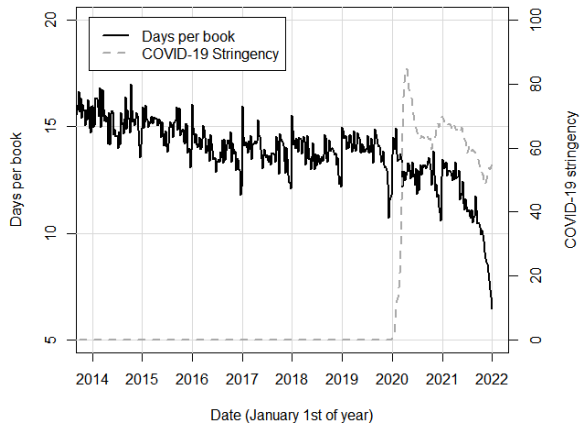


Figure 6: % Change in Number of Days per Book

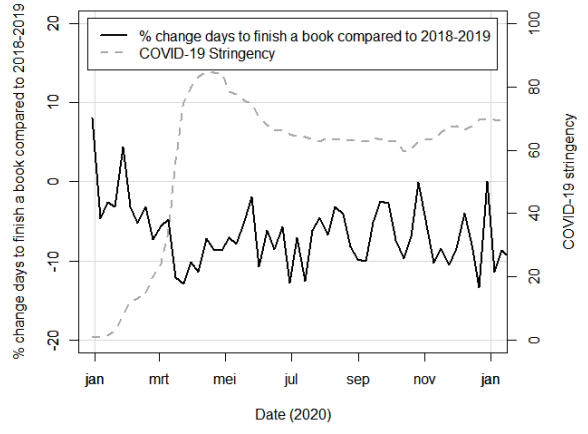


Figure 5 also shows a seasonal pattern over time. It seems that each year around Christmas there is a drop in the days spent to finish a book, while there is a spike in the days required to finish a book in the first week of the new year. Figure 7 indicates that the average book length also decreases during Christmas and peaks in the first week of the new year. Therefore, it could be that during Christmas people are reading shorter Christmas novels and

temporarily stop reading other books, which they then finish in the new year. Moreover, while the number of pages per book seams to increase in the middle of the year, the days required to finish a book decrease during these periods, which suggests an increase in reading speed during summer. This is presumably caused by the increase in free time during summer holidays.

Figure 7: Average Number of Pages per Book

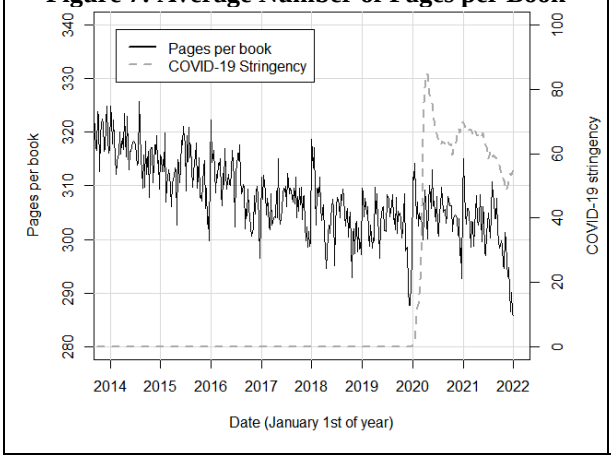


Figure 8: % Change in Number of Pages per Book

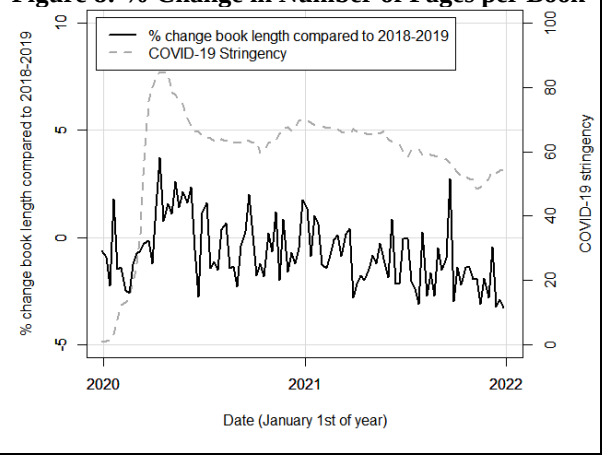


Figure 8 shows the percentage change in book length during each week of the pandemic compared to the average in the same week during 2018 and 2019. Except the small increase during the first wave of the pandemic, this plot does not show a clear relationship between COVID-19 stringency and the length of books that are being read.

5.3 Book Rating

Figure 9 plots the average book rating over time compared to the COVID-19 stringency. While it seems that the COVID-19 stringency and average rating move in a similar direction, this effect does not seem to be different from the regular weekly fluctuations before the pandemic and the slight positive linear increase over time. Hence, this plot does not provide strong evidence for a causal relationship between COVID-19 policy stringency and book satisfaction.

Figure 9: Average Book Rating

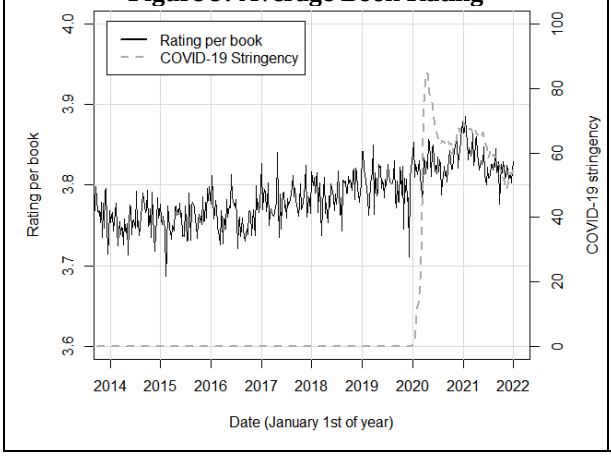


Figure 10: % Change in Average Book Rating

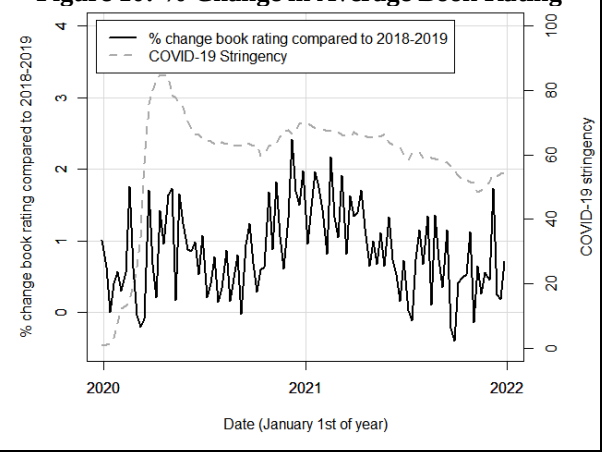


Figure 10 plots the percentage change in book rating during each week of the pandemic compared to the average rating in the same week in 2018 and 2019. In this plot, it seems that during more stringent periods of COVID-19, book ratings are up to 2% higher compared to the same week in 2018 and 2019. This effect is seen in all three periods of increasing stringency. This contradicts our expectation that the pandemic would have lead to lower book ratings.

5.3 Book Characteristics

To determine whether COVID-19 measures impacted the types of books being read, we plotted the proportions of nostalgic books added and the percentage of recent publications added against the COVID-19 stringency index (see Figure 11). Moreover, in Figure 12 we plotted the percentage change in nostalgic and recent published books added during each week of the pandemic compared to the average in the same week in 2018 and 2019. In these plots, we can see that the proportion of nostalgic books added increased especially during the first and most severe wave of COVID-19 measures, while the proportion of recently published books decreased during this period. This aligns with the expectation that the pandemic caused people to read more nostalgic books due to a longing for the past.

Figure 11: Proportions of Nostalgic Books and Recent Publications Added

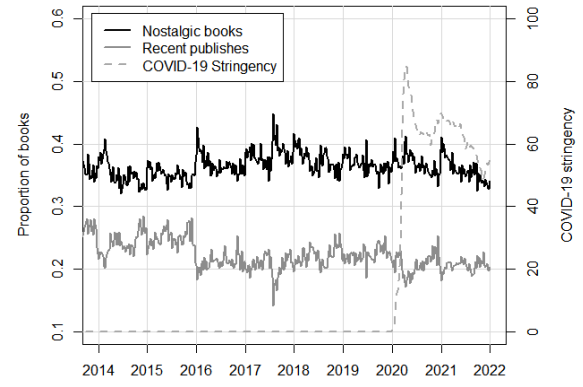
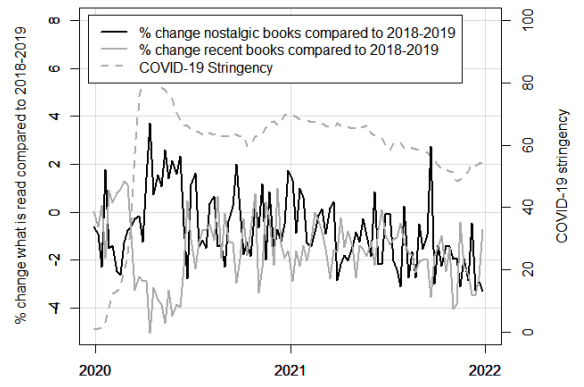


Figure 12: % Change in Nostalgic Books and Recent Publications Added



6. Model

6.1 Basic Model

To formally test our expectations, we constructed linear regression models that examine the effects of COVID-19 stringency on book consumption and how reader characteristics moderate these effects. Specifically, the relationship between the OxCGRT stringency index per country and the number of books added per active user is tested, as well as (conditional upon reading) the number of days per book, the average rating per book, the percentage of nostalgic and recently published books and the length of each book. The regression models are

estimated for the eight-year period from January 2014 to December 2021, such that the model will be able to accurately estimate the time trends and seasonality effects that were observed in Chapter 5. The following general linear regression model for each week *t* tests the impact of the COVID-19 stringency on the dependent variables for each week and for each user *i* from country *c*:

$$Y_{it} = \beta_0 + \beta_1 * CovidStringency_{ct} + \beta_{2c} * Country_c + \beta_3 * Time_t + \beta_{4t} * Week_t + error_{it}.$$

Here, Y_{it} is the dependent variable of interest for user *i* at week *t*, $CovidStringency_{ct}$ is the OxCGRT stringency index in the country of user *i* at week *t*, $Country_c$ is a dummy variable that represents the country of user i that is used to capture differences between users from different countries, $Time_t$ is the time fixed effect which is used to capture linear trends over time that were observed in Chapter 5, $Week_t$ is a dummy variable that ranges between 1 and 53 and that takes into account week-level fixed effects, such as holidays and weather conditions, and $error_{it}$ is the error term. In the remainder of this study, we refer to this model as Model 1.

6.2 Extended Model

Secondly, to check if the impact of COVID-19 measures differ for different groups of readers, an extended version of the previous model is tested, which also estimates the interaction effect between a dummy variable for different user groups and the COVID-19 stringency index:

$$Y_{it} = \beta_0 + \beta_1 * CovidStringency_{ct} + \beta_{2g} * Group_g + \beta_{3g} * Group_g * CovidStringency_{ct} + \beta_{4c} * Country_c + \beta_5 * Time_t + \beta_{6t} * Week_t + error_{it},$$

where $Group_g$ is a dummy variable that represents the group effect of group g user *i* is part of, which could represent the age group, gender, country or whether the user belongs to the most fanatical readers. Here, we apply the same age groups as Reid (2020), that is, aged under 35, between 35–55 or over 55. The age group of each reader is not a static variable, but rather depends on the actual age of the reader at each moment in time. Moreover, the fanatical readers dummy variable represents if a user has been an active member on Goodreads for at least one year and has read at least one book per week on average during their active period. The remainder of this study refers to this model as Model 2.

Please note that Model 2 will be estimated for each dependent variable and each group separately. The reason for this is that only 8.9% of users has made their gender available and only 33.9% of users have specified their age. Hence, if we would compute Model 2 with all interaction effects at once, the estimates of the model will only be based on a small fraction of

the total dataset. Especially for the interaction effect of countries with a smaller amount of members this would be problematic. The impact that removing all users that have not specified their age and gender from the analysis could strongly bias the estimates of the interaction effect of these countries.

6.3 Robustness Checks

In the previously defined models, the week in which a book is added was used to aggregate the dependent variables. Since this variable is automatically added by Goodreads for each book record, it is present for all book reading records in the dataset. Nevertheless, the date on which a book is added to Goodreads does not necessarily represent the moment it was read. Therefore, a robustness check is added to the analysis to investigate if similar results would be obtained when aggregating at the indicated start dates of the book consumption rather than the date added, which is available for 47.6% of book reading records. The remainder of this study refers to this model as Model 3.

7. Results

This chapter presents the results of the analysis using the models specified in Chapter 6. First, Section 7.1 shows the results of the basic regression model (i.e., the model without heterogeneity effects). Next, Section 7.2 tests the extended model to check for heterogeneity. Finally, Section 7.3 check the robustness of both models by examining the dates started and finished rather than the dates added.

In this chapter we will report several estimates of the relationship between the COVID-19 stringency index and our dependent variables. To illustrate the implication of these estimates on book consumption in practice, we will often compute and show their impact on weekly book consumption for weeks with an average OxCGRT stringency index of 50. A stringency score of 50 is chosen as it exactly represents the median of possible stringency index scores. However, please be aware that between January 2020 and December 2021, the COVID-19 stringency index in the countries of our sample group has been above this value for about 66% of the time.

7.1 Basic Model

After running Model 1 on the dependent variables of interest, we find that this model is generally not able to provide an accurate prediction of the dependent variables of interest. Despite that the F-tests show that Model 1 for all dependent variables provides a better fit than the model with no independent variables would (all $p < .001$), the R^2 and R^2_{adj} values range between .00244 and .04906. Model 1 is thus not able to explain more than 5% of variation in

the dependent variables of interest (see Table 9). Moreover, compared to the means and medians of the dependent variables of interest (see Table 8), the residuals of standard error of Model 1 are relatively large.

Table 9: Estimate of the Relationship between COVID-19 Stringency and Book Consumption (Model 1)

Dependent Variable	β_1	*p*-value of β_1	R^2	Adjusted R^2	Residual Std. Error	F Statistic
Number of books	.003975	<.001	.00245	.00244	4.909 (df =17,482,325)	(86; 17,482,325) = 498.3, *p*<.001
Days per book	-.03297	<.001	.00853	.00851	90.02 (df =3,038,255)	(85; 3,038,255) = 307.6, *p*<.001
Rating	.00006142	.005	.01619	.01617	.8549 (df =3,704,189)	(85; 3,704,189) = 717.1, *p*<.001
Number of pages	.07229	<.001	.01335	.01333	158.9 (df =3,916,725)	(85; 3,916,725) = 623.6, *p*<.001
% Nostalgic	-.0000334	.001	.02816	.02814	.4106 (df =3,800,160)	(85; 3,800,160) = 1,296, *p*<.001
% Recent published	-.0001295	<.001	.04906	.04904	.3708 (df =3,800,160)	(85; 3,800,160) =2,307, *p*<.001

Due to the low predictive power of Model 1, we assume that individual users' book reading behavior over different weeks varies greatly. It is therefore difficult to accurately predict this behavior on a weekly level per user. Nevertheless, the model-free analysis in Chapter 5 provided evidence that the aggregated behavior of all users over time is explained to a certain extent by time trends, seasonality and COVID-19 stringency. It is therefore assumed that a regression model tested on the dependent variables aggregated per country per week might show a much higher model fit. For this reason, the analysis is extended by running the following log-linear regression model (i.e., Model 1b):

$$\log Y_{ct} = \beta_0 + \beta_{1c} * CovidStringency_{ct} + \beta_{2c} * Country_c + \beta_3 * Time_t + \beta_{4t} * Week_t + error_{ct},$$

where Y_{ct} is the dependent variable of interest aggregated on a weekly level per country, $CovidStringency_{ct}$ is the OxCGRT stringency index in country c at week t, $Country_c$ is a dummy variable that represents the country effect, $Time_t$ is the time fixed effect, $Week_t$ is a dummy variable that takes into account week-level fixed effects that ranges between 1 and 53 and $error_{ct}$ is the error term.

Table 10 displays the results of running Model 1b . As expected, Model 1b is better at providing an accurate prediction of book consumption. The F-tests show that Model 1b for all dependent variables provides a better fit than the model with no independent variables would (all $p < .001$). Moreover, R^2 and R^2_{adj} range between .415 and .636, showing that Model 1b is able to explain between 41% and 63% of variation in the dependent variable of interest.

Additionally, all the residuals' standard errors are relatively low compared to the mean and medians of the dependent variables (see Table 8). Therefore, we conclude that the data aggregated at a weekly country level is predicted more accurately than at the weekly user level when taking COVID-19 stringency, time, country and the week of the year into account.

Table 10: Estimate of the Relationship between COVID-19 Stringency and Book Consumption (Model 1b)

Dependent Variable	β_1	*p*-value of β_1	R^2	Adjusted R^2	Residual Std. Error	F Statistic
Number of books	.006661	<.001	.577	.574	.2984 (df =13,290)	(85;13,290) = 213, *p*<.001
Days per book	-.002756	<.001	.418	.415	.3552 (df =13,290)	(85;13,290) = 112.5, *p*<.001
Rating	.00003152	.002	.582	.579	.02254 (df =13,290)	(85;13,290) = 217.4, *p*<.001
Number of pages	.0001692	<.001	.593	.591	.05176 (df =13,290)	(85;13,290) = 228.1, *p*<.001
% Nostalgic	-.0000428	.598	.543	.540	.1777 (df =13,290)	(85;13,290) = 185.9, *p*<.001
% Recent published	-.000586	<.001	.636	.634	.2755 (df=13,290)	(85;13,290) = 273, *p*<.001

Nevertheless, Tables 9 and 10 indicate that the beta coefficients of the COVID-19 stringency index (i.e., β_1) in both Models 1 and 1b are significant for all dependent variables of interest, except for the percentage of nostalgic books. Therefore, we can still interpret the impact that COVID-19 restrictions have on both the dependent variables in Models 1 and 1b.

Regarding the number of books added per user per week, the corresponding β_1 in Model 1 equals .003975 ($p < .001$). Translated to a (fictional) situation with an average weekly COVID-19 stringency of 50, the number of books added per week would be 0.19875 higher than in weeks without COVID-19 measures. In the log-linear regression model (i.e., Model 1b), β_1 equals .00661 ($p < .001$), implying a 33.05% increase in the number of books added in a week where the COVID-19 stringency would equal 50. Given that the average number of books added per week per user equals 0.72 (see Table 8), we conclude that both models confirm that COVID-19 restrictions have a significant positive impact on the number of books added per week, which aligns with the expectation we formulated in Chapter 3.

Secondly, Chapter 3 also presented the expectation that people finish reading books faster during restrictive COVID-19 periods. Regarding the average number of days required to finish a book in Table 9, β_1 for Model 1 equals -.03297 ($p < .001$), which means that during weeks with a COVID-19 stringency of 50, books are finished on average 1.65 days faster than during weeks without COVID-19 restrictions. This finding is supported by Model 1b, in which β_1 equals -.002756 ($p < .001$), implying that the days required to finish a book is on average

13.78% lower in a week where the COVID-19 stringency equals 50. It is therefore concluded that COVID-19 restrictions significantly lower the time required to finish a book. Next, for the average weekly rating per user in Model 1, β_1 is equal to .00006142 (p = .005), implying that a COVID-19 stringency index of 50 would result in an increase in average rating of 0.0031 stars. This is a low impact, given that star ratings range between 0 and 5. In Model 1b, the impact of COVID-19 restrictions on ratings is also low (i.e., β_1 = .00003152 and p = .002). Hence, the impact of COVID-19 restrictions on book ratings is classified as negligibly small.

In Chapter 3, we also formulated the expectation that during the pandemic, people would read longer books. Given that β_1 for the number of pages in both Models 1 and 1b are significantly positive (Model 1: β_1 = .07229, p < .001; Model 1b: β_1 = .0001692, p < .001) adds to this expectation. However, translating these estimates into the impact of a COVID-19 stringency index of 50 on the length of books implies an increase of 3.615 pages and 0.85%, respectively. Given that the average length of a book equals 314 pages, we conclude that the effect of COVID-19 restrictions on the length of books is positive but relatively minor.

Finally, we find that our expectation that people would be reading more nostalgic books and less recent published books does not hold. Although the negative significant β_1 in Models 1 and 1b for the percentage of recent publications imply a decrease in the consumption of the recently published books (Model 1: β_1 = -.0001295, p < .001; Model 1b: β_1 = -.000586, p < .001), when translating these effects to the impact a COVID-19 stringency index of 50 would have, the impact remains below 1%. The same holds for β_1 of Model 1 on the percentage of nostalgic books (β_1 = -.0000334, p = .001). In fact, Model 1b does not find a significant relationship between the COVID-19 stringency index and the percentage of nostalgic books added (β_1 = -.0000428, p = 598). It is therefore concluded that COVID-19 restrictions did not have a significant impact on the percentage of nostalgic books read or the percentage of recent publications read.

Finally, we find that the control variables in Models 1 and 1b all have face-valid effects, except the country dummy variable in Model 1 for the number of books added per week. For an overview of the effects of all control variables in the constructed models, see Appendix A.

7.2 Extended Model

In this sub-section we will show the results of the extended model formulated in the previous chapter, i.e. Model 2. In this model, we check for heterogeneity, which is reflected in the interaction coefficient of the model formulation, i.e. β_{3g}.

Since only 8.9% of users have made their gender available and only 33.9% of users have specified their age, we first have to check if the groups of users for which we have their gender and the group of users for which we have their age both showed similar behavior as the full dataset. Therefore, for each dependent variable of interest, we re-compute Model 1 with only the users for which we know the gender and respectively age, and check if the constructed models look similar to the results from section 7.1. The comparison of these models can be found in Appendix A. We observe that Models 1 computed for the subsets of users with age and respectively gender available look similar for the dependent variables number of books per week, average number of days per book and number of pages. These are also the dependent variables for which Model 1 and Model 1b found that COVID-19 restrictions had the most significant impact. For the other three dependent variables we find that Model 1 with only users with gender and respectively age available significantly differ from our results from section 7.1 (see Appendix A). Therefore, we cannot reliably determine the influence of gender and age on these dependent variables.

In Table 11, we report the model fit of Model 2 computed for the different heterogenetic variables and dependent variables of interest. We find that, like Model 1, Model 2 is not able to provide an accurate prediction of the dependent variables of interest. When comparing the fit statistics of Model 1 and Model 2, we conclude that the fit of Model 2 is similar to the fit of Model 1. Hence, Model 2 does not provide a large improvement over Model 1.

Table 11:Estimate of the interaction between COVID-19 Stringency and dependent variables (Model 2)

Dependent Variable	R^2	$R^2_{adjusted}$	Residual Std. Error	F Statistic
Male readers				
Number of books	.0141	.0141	6.826 (df = 1,816,684)	(88; 1,816,684) = 295.6, p<.001
Days per book	.0111	.0109	78.11 (df = 399,483)	(87; 399,483) = 51.43, p<.001
Number of pages	.0191	.0189	161.7 (df = 488,504)	(87; 488,504) = 109.4, p<.001
Age (>35 & <55)				
Number of books	.0028	.0028	9.802 (df = 1,600,830)	(89; 1,600,830) = 50.99, p<.001
Days per book	.0076	.0075	87.71 (df = 1,256,834)	(89; 1,256,834) = 108.3, p<.001
Number of pages	.0149	.0148	161 (df = 1,570,398)	(89; 1,570,398) = 266.2, p<.001
Fanatic readers				
Number of books	.0148	.0148	4.879 (df = 17,482,323)	(88; 17,482,323) = 2,991, p<.001
Days per book	.0165	.0165	89.66 (df = 3,038,253)	(87; 3,038,253) = 587, p<.001
Rating	.0204	.0204	.8531 (df = 3,704,187)	(87; 3,704,187) = 885.4, p<.001
Number of pages	.0149	.0148	158.8 (df = 3,916,723)	(87; 3,916,723) = 679.3, p<.001
% Nostalgic	.0311	.0311	.410 (df = 3,800,158)	(87; 3,800,158) = 1,402, p<.001
% Recent published	.0555	.0555	.3696 (df = 3,800,158)	(87; 3,800,158) = 2,569, p<.001
Countries				
Number of books	.0025	.0025	4.909 (df = 17,482,295)	(116; 17,482,295) = 374.3, p<.001
Days per book	.0088	.0088	90.01 (df = 3,038,225)	(115; 3,038,225) = 235.8, p<.001
Rating	.0165	.0165	.8547 (df = 3,704,159)	(115; 3,704,159) = 541, p<.001
Number of pages	.0137	.0136	158.9 (df = 3,916,695)	(115; 3,916,695) = 472, p<.001
% Nostalgic	.0288	.0287	.4105 (df = 3,800,130)	(115; 3,800,130) = 979, p<.001
% Recent published	.0507	.0507	.3705 (df = 3,800,130)	(115; 3,800,130) = 1,766, p<.001

Despite that Model 2 is not significantly better than Model 1, we do find that several interactions of Model 2 are significant. In Table 12, we report all interaction estimates on the user level for each dependent variable and group.

Table 12: significant large interaction coefficients showing Heterogeneity effects from Model 2

Group	# of books	# days per book	rating	# pages	% nostalgic	% recent
Gender: Male	**-.0105**	**-.067**	-	-.001	-	-
Age: <35	**.0062**	-.019	-	**-.096**	-	-
Age: >35 & <55	.0022	.004	-	**-.130**	-	-
Fanatic: Yes	**-.0055**	**.157**	**-.00012**	**.066**	**.00011**	-.00002
American						
Baseline: Argentina	-	-	-	-	-	-
Country: Mexico	**.0035**	**-.027**	**.00031**	**.203**	**-.00010**	-.00003
Country: Panama	.0012	.028	.00031	**.178**	**.00086**	**-.00056**
Country: Venezuela	.0025	**.071**	-.00020	**.279**	**-.00042**	**.00039**
European						
Country: Russia	.0009	.008	**-.00077**	**.338**	-.00005	**-.00033**
Country: Bulgaria	**.0045**	-.028	**.00056**	**.229**	-.00008	-.00009
Country: Estonia	**.0047**	.029	**.00134**	**.121**	.00012	**-.00068**
Country: Latvia	**.0045**	-.001	**.00097**	.059	**-.00025**	.00013
Country: Poland	**.0039**	**.034**	.00004	**.224**	**-.00052**	**.00010**
Country: Romania	**.0026**	-.018	**.00038**	**.211**	**-.00042**	**-.00031**
Country: Lithuania	**.0030**	**-.029**	**.00096**	**.396**	**-.00046**	**-.00016**
Country: Norway	**.0030**	**-.029**	-.00023	-.033	**-.00015**	**.00019**
Country: Sweden	**.0015**	**.039**	**-.00089**	**.122**	.00008	**.00037**
Country: Finland	**.0055**	**.028**	-.00012	**.261**	**-.00053**	**.00084**
Country: Austria	**.0046**	.031	-.00012	.040	.00020	-.00006
Country: Italy	**.0019**	**.031**	**.00027**	**.141**	-.00006	-.00001
Country: UK	**.0031**	**.028**	**.00041**	**.178**	**-.00019**	**.00026**
Country: Netherlands	**.0028**	.012	**.00048**	**.090**	**.00032**	-.00006
Country: Portugal	**.0031**	.006	**.00036**	**.153**	.00007	**-.00018**
Asian / Pacific						
Country: Nepal	**.0042**	**-.126**	.00033	.044	**.00025**	**-.00066**
Country: Indonesia	**.0045**	**-.089**	**.00177**	-.027	**.00059**	**-.00160**
Country: Malaysia	**.0037**	**-.066**	**.00193**	**-.079**	**.00075**	**-.00170**
Country: Bangladesh	-.0004	**-.064**	-.00010	**.171**	**.00018**	-.00003
Country: Singapore	**.0040**	**-.070**	-.00019	**.061**	**-.00019**	.00008
Country: Pakistan	**.0023**	**-.076**	**.00084**	.021	-.00012	.00010
Country: India	**.0031**	**-.122**	**.00063**	**.040**	**-.00022**	**.00017**
Country: Philippines	**.0032**	**.034**	-.00012	**.220**	**.00064**	**-.00103**
Country: Australia	**.0029**	**.031**	.00029	**.247**	**-.00020**	**.00044**
Arabic						
Country: Egypt	**.0036**	**-.122**	-.00016	**.111**	**.00096**	**-.00083**
Country: UAE	**.0023**	**-.085**	.00010	**.177**	**.00023**	**.00020**
Country: Turkey	.0008	.018	**-.00027**	.079	.00041	-.00053

All bold and black reported relationships in this table are significant at the p<.05 level. All grey reported estimates are not significant (i.e. p>.05). All estimates are computed at the user-level.

In Chapter 3, we formulated the expectation that the change in book consumption for women would be stronger than for men. Looking at Table 12, we conclude that this expectation partly holds. Although we observe that the increase in number of books added per week indeed increased stronger for women ($\beta_{covid*male}$ = -.0105, p<.001), we also see that the number of days required to finish a book decreased stronger for men than for women ($\beta_{covid*\text{male}}$ = -.067, p<.001). Moreover, there is no significant difference between men and women on the length of books read during restrictive periods. An explanation for this could be that female readers suffered more from concentration issues due to the pandemic than men. As a result, despite starting to read more books than men, female readers were more often distracted while reading. Consequently, female readers showed a less strong decrease in time required to finish a book than male readers.

In Chapter 3, we also formulated the expectation that the increase in reading quantity and speed would be higher for people aged below 35 and above 55 than for people aged between 35 and 55. Looking at Table 12, we conclude that this expectation does not hold. Specifically, we find that the number of books added per week only significantly increased for people aged below 35 ($\beta_{covid*young}$ =.0062, p<.001). We find no significant relationship for the interaction of COVID-19 restrictions and the different age groups for the number of days required to finish a book. A possible explanation for this could be that not only the people aged between 35 and 55 did not see a significant increase in their free time during the pandemic, but also that people aged above 55 did not see a significant increase in their free time, as many of them may for example already be retired. Moreover, it could be that for younger people more of their normal daily activities were cancelled during the pandemic than for older people, which resulted in their additional free time increasing the most. A final explanation could be found in the interaction with regards to book length, which is significantly negative for both young and middle aged readers ($\beta_{covid*young}$ =.-.096, p<.001; $\beta_{covid*middle}$ =.-.096, p<.001). This implies that the increase in book length was strongest for readers above 55 years old. Hence, while readers aged below 35 started reading more books, readers above 55 started reading longer books.

We also formulated the expectation that book consumption shifted the strongest for the most fanatic readers. The results reported in Table 12 contradict this expectation. All interaction coefficients of the fanatic reader variable with the COVID-19 stringency index move in an opposite direction as the direct effect of the COVID-19 stringency index. Hence, book reading in fact changed more strongly for the less fanatic readers. An explanation could be that before the pandemic, fanatic book readers were already spending the majority of their free time on

reading. As book reading is one of the few hobbies that could be continued during lockdowns, these fanatic readers might not have seen a similar increase in free time as people who were previously spending their free time on hobbies that were no longer allowed during lockdowns. Therefore, less fanatic readers had to search for alternative hobbies to a greater extent than fanatic book readers, which resulted in them increasing their reading more strongly.

Finally, looking at the interaction of the COVID-19 stringency index and the country dummy variables in Model 2, we see that the impact of COVID-19 restrictions strongly differed between countries. For example, we find that especially in Asian countries the number of days required to finish a book decreased strongly during the pandemic. On the other hand, it appears that especially in West-European countries this change was much weaker. Moreover, it seems that the increase in book length during the pandemic was strongest in some East-European countries. This confirms our expectation that changes in book consumption during restrictive periods were not equal across countries.

7.3 Robustness Checks

This section outlines the robustness of our results to an alternative way of measuring book consumption per week. Specifically, model 1 is applied again, but now instead of exploring book reading behavior based on the date a book is added, we will be comparing this behavior to the date a book is started. The results of this robustness check can be found in Appendix B. Comparing the outcomes of these models to the original Model 1, we observe similar results in the significance of estimates and their direction. Therefore, we conclude that our robustness checks confirm our previous conclusions.

8. Discussion

8.1 Summary of Main Findings

This thesis provided an overview of how COVID-19 restrictions have impacted book consumption. We showed that during stringent COVID-19 measures in both 2020 and 2021, people typically started to read more books per week, finish books in a smaller amount of days and started to read longer books. Moreover, we showed that the effect of COVID-19 measures on book ratings and on the share of nostalgic and recent published books is neglectable small. Furthermore, this thesis found evidence that female readers relatively started to read more books than men, but that male readers increased their reading pace more than female readers. Moreover, the results of this thesis indicate that especially younger people started to consume more books during periods of COVID-19 measures, while older readers started to read longer

books. Additionally, our results have shown that especially less fanatic readers increased book consumption the most, finished books in a shorter amount of time and started to read longer books. Lastly, we found that changes in book consumption during restrictive periods were not equal across countries.

8.2 Theoretical and Managerial Implications

The main contributions of this thesis to existing literature are threefold. First, we have shown that during stringent COVID-19 measures people increased the amount of books they consume, their reading pace and the length of books they read. This supports the findings of existing survey studies that during the pandemic people spend an increased amount of time on reading. Secondly, as our study is the first research that does not rely on survey data to investigate the impact of COVID-19 on book consumption, our research provides evidence that the findings from the available survey studies also hold when tested with different sorts of data. Thirdly, by comparing book reading records up to two years into the pandemic, we have shown that the effects of COVID-19 measures on book reading were not only present during the first wave of corona restrictions, but also during later waves. From a societal perspective, this thesis has shown that COVID-19 has had a positive impact on book reading. Moreover, as it seems that book reading most strongly increased for people that were not fanatic readers yet, institutions and organizations concerned with the decreasing trend in book reading over the past couple of decades could take advantage of potential new periods of lockdown to intensively try to convince more people to increase their book reading. Concerning the practical implications, book publishers and retailers could use the findings from our research to adapt marketing efforts during future restrictive periods. For example, book sellers might want to increase their promotional activities during such periods, as people not only start to read more books, but also read faster. Hence, it is likely that people will be more actively searching for new books during these periods, which would increase demand and potential sales.

8.3 Limitations and Future Research

Although our research has found some clear evidence that COVID-19 measures impacted book consumption, it still has its limitations. First of all, the models that we constructed on the weekly user level have a very low predictive power and do not have a high model fit. Hence, we are not able to provide clear insights on what drives book consumption on the user level. Therefore, an interesting avenue for future research would be to investigate how book consumption on the reader level can be predicted more accurately. Another interesting avenue for future research would be to investigate what underlying economical, societal and/or

cultural differences between countries predict different responses during the pandemic. As our research has shown, responses to the pandemic differed for different parts of the world. However, we still miss out on explaining the drivers for these differences. Secondly, our research does not examine if the impact of COVID-19 measures varies across different book genres. Especially from a business perspective it would be interesting to know what book genres thrive during lockdowns and what genres suffer the most from lockdowns. Thirdly, our research did not control for potential shifts in book marketing efforts during the pandemic. Possibly, book sellers could have increased their marketing efforts during the pandemic to promote book reading as an activity that can still be done. Therefore, another interesting avenue for future research includes testing if and how changes in book marketing during the pandemic impacted reading behavior. Lastly, since Goodreads is a community website for book reading, it is likely that our sample mainly exists of people who sort or less have a passion for reading, otherwise it does not really make sense to sign up for Goodreads. Therefore, our research findings do not necessarily represent the impact of COVID-19 on book consumption in general, but more on the book consumption of people that like to read.

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Appendix A: Comparison of Model 1 with Different Datasets

Table 1: Number of Books Added Per User (Model 1)

	All users		Only Gender		Only Age	
	Estimate	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**
(Intercept)	3.409	0.4875	3.908	.570	3.643	.467
CovidStringency	.00398	<.001	.00258	<.001	.003075	<.001
week10	-.340	<.001	-.430	<.001	-.52601	<.001
week11	-.342	<.001	-.397	<.001	-.48846	<.001
week12	-.333	<.001	-.392	<.001	-.45653	<.001
week13	-.335	<.001	-.421	<.001	-.47764	<.001
week14	-.327	<.001	-.366	<.001	-.47876	<.001
week15	-.341	<.001	-.430	<.001	-.44266	<.001
week16	-.349	<.001	-.385	<.001	-.41448	<.001
week17	-.350	<.001	-.375	<.001	-.4052	<.001
week18	-.368	<.001	-.459	<.001	-.51914	<.001
week19	-.371	<.001	-.429	<.001	-.46978	<.001
week2	-.137	<.001	-.164	.002	-.16281	.029
week20	-.370	<.001	-.455	<.001	-.52049	<.001
week21	-.363	<.001	-.381	<.001	-.54258	<.001
week22	-.355	<.001	-.413	<.001	-.43961	<.001
week23	-.376	<.001	-.485	<.001	-.48403	<.001
week24	-.371	<.001	-.413	<.001	-.49166	<.001
week25	-.367	<.001	-.475	<.001	-.35603	<.001
week26	-.357	<.001	-.426	<.001	-.53002	<.001
week27	-.333	<.001	-.401	<.001	-.51016	<.001
week28	-.337	<.001	-.398	<.001	-.50974	<.001
week29	-.326	<.001	-.379	<.001	-.44763	<.001
week3	-.186	<.001	-.251	<.001	-.37375	<.001
week30	-.309	<.001	-.335	<.001	-.48144	<.001
week31	-.273	<.001	-.190	<.001	-.35176	<.001
week32	-.307	<.001	-.276	<.001	-.4345	<.001
week33	-.315	<.001	-.380	<.001	-.42575	<.001
week34	-.298	<.001	-.330	<.001	-.38013	<.001
week35	-.302	<.001	-.292	<.001	-.32398	<.001
week36	-.338	<.001	-.334	<.001	-.44415	<.001
week37	-.358	<.001	-.379	<.001	-.50608	<.001
week38	-.355	<.001	-.398	<.001	-.42897	<.001
week39	-.348	<.001	-.401	<.001	-.4197	<.001
week4	-.203	<.001	-.327	<.001	-.30844	<.001
week40	-.364	<.001	-.412	<.001	-.54171	<.001
week41	-.360	<.001	-.365	<.001	-.48071	<.001
week42	-.357	<.001	-.404	<.001	-.48451	<.001
week43	-.352	<.001	-.341	<.001	-.49103	<.001
week44	-.316	<.001	-.385	<.001	-.43434	<.001
week45	-.345	<.001	-.368	<.001	-.44797	<.001
week46	-.330	<.001	-.379	<.001	-.39887	<.001
week47	-.354	<.001	-.416	<.001	-.49961	<.001
week48	-.327	<.001	-.345	<.001	-.41168	<.001
week49	-.308	<.001	-.371	<.001	-.30192	<.001
week5	-.216	<.001	-.234	<.001	-.30647	<.001
week50	-.271	<.001	-.251	<.001	-.20163	.009
week51	-.250	<.001	-.246	<.001	-.33121	<.001
week52	.174	<.001	.169	.001	.268603	<.001
week53	.058	0.0149	.030	.757	.217686	.134
week6	-.242	<.001	-.305	<.001	-.248	.001
week7	-.255	<.001	-.245	<.001	-.39129	<.001
week8	-.276	<.001	-.314	<.001	-.41805	<.001
week9	-.305	<.001	-.351	<.001	-.44027	<.001
date	-.00018	<.001	-.00021	<.001	-.00051	<.001

Country: Argentina	.589	.905	.840	.903	.931	.890
Country: Australia	.929	.850	1.445	.833	.451146	<.001
Country: Austria	.883	.857	1.419	.836	.281044	.051
Country: Bangladesh	1.092	.824	1.569	.819	2.320712	<.001
Country: Bulgaria	.519	.916	.626	.927	-.54272	<.001
Country: Egypt	.399	.935	.723	.916	-.17592	.001
Country: Estonia	.745	.879	1.179	.864	-.07056	.413
Country: Finland	1.056	.830	1.356	.843	.457271	<.001
Country: India	.397	.936	.633	.927	.068182	.191
Country: Indonesia	.462	.925	.671	.922	.003303	.951
Country: Italy	.877	.858	1.212	.860	.452444	<.001
Country: Latvia	.554	.910	.894	.896	-.45093	<.001
Country: Lithuania	.617	.900	.830	.904	-.27935	<.001
Country: Malaysia	.527	.915	.733	.915	.202321	.007
Country: Mexico	.512	.917	.724	.916	-.27182	<.001
Country: Nepal	.460	.925	.656	.924	.574408	<.001
Country: Netherlands	.740	.880	1.638	.811	-.04052	.596
Country: Norway	.789	.872	1.102	.873	.200037	.001
Country: Pakistan	.457	.926	.681	.921	.22875	.006
Country: Panama	.551	.911	.770	.911	-.27093	.046
Country: Philippines	.557	.910	.858	.901	.203971	<.001
Country: Poland	1.012	.837	1.391	.839	.40877	<.001
Country: Portugal	.560	.909	.829	.904	-.17776	.001
Country: Romania	.647	.895	.823	.905	-.01405	.817
Country: Russia	.725	.883	.925	.893	.013036	.897
Country: Singapore	.575	.907	.859	.900	.392484	<.001
Country: Sweden	.966	.844	1.307	.849	.367747	<.001
Country: Turkey	.693	.888	1.014	.883	.340014	<.001
Country: United Arab Emirates	.520	.916	.736	.915	-.21438	.030
Country: United Kingdom	.816	.868	.981	.886	.209575	<.001
Country: >1	.807	.870	1.260	.854	.499827	<.001
Country: Venezuela	.589	.905	.821	.905	.206558	.034

Table 2: Average Number of Days Required to Finish a Book (Model 1)

	All users		Only Gender		Only Age	
	Estimate	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**
(Intercept)	157.2885	<.001	156.4768	<.001	14.4292	<.001
CovidStringency	-.03297	<.001	-.02204	<.001	-.02519	<.001
week10	-3.06938	<.001	-1.99553	.106	-2.32055	.002
week11	-2.44018	<.001	-1.98866	.105	-1.40041	.066
week12	-2.77583	<.001	-2.87618	.019	-2.2318	.003
week13	-2.99741	<.001	-1.44413	.246	-1.99793	.010
week14	-2.25659	<.001	-2.87512	.019	-1.44305	.058
week15	-2.84144	<.001	-3.1572	.010	-2.28066	.003
week16	-2.45364	<.001	-.51295	.677	-2.12822	.005
week17	-1.90668	<.001	-1.36883	.272	-1.56786	.044
week18	-2.51886	<.001	-.5634	.650	-.89407	.245
week19	-3.13918	<.001	-2.82269	.023	-3.00447	<.001
week2	-1.70586	.001	-.53314	.658	-.80803	.276
week20	-2.62067	<.001	-1.15053	.352	-1.55084	.044
week21	-2.53044	<.001	-2.15285	.084	-1.49729	.054
week22	-3.33158	<.001	-3.52019	.005	-2.98494	<.001
week23	-3.42782	<.001	-2.33153	.059	-1.87039	.015
week24	-3.15627	<.001	-2.9087	.019	-2.73823	<.001
week25	-2.66576	<.001	-.73749	.551	-2.31929	.003
week26	-3.8327	<.001	-1.953	.119	-2.72748	<.001
week27	-3.04597	<.001	-1.70916	.164	-2.08587	.006
week28	-3.91841	<.001	-1.93407	.115	-2.73175	<.001
week29	-4.15933	<.001	-3.36448	.006	-3.08039	<.001
week3	-1.90499	<.001	-1.31778	.278	-1.31301	.079
week30	-2.75373	<.001	-2.3295	.061	-1.88451	.015
week31	-3.37404	<.001	-3.05821	.013	-3.21847	<.001
week32	-3.52319	<.001	-2.59992	.033	-2.51149	.001
week33	-2.76852	<.001	-2.78591	.023	-1.82332	.017
week34	-1.72778	.001	-2.48292	.044	-.64341	.402
week35	-2.25361	<.001	-.22826	.854	-1.59323	.041
week36	-2.22788	<.001	-1.18802	.332	-1.79532	.019
week37	-2.04128	<.001	-1.58948	.196	-.40726	.596
week38	-2.18789	<.001	-1.85341	.133	-2.09422	.007
week39	-2.38233	<.001	-.68672	.585	-.90612	.250
week4	-1.30234	.009	-.18289	.881	-.4289	.570
week40	-2.71536	<.001	-2.29087	.064	-1.51333	.051
week41	-2.79974	<.001	-2.88342	.019	-2.03975	.008
week42	-2.62318	<.001	-2.26889	.065	-1.74721	.024
week43	-2.86183	<.001	-3.08688	.013	-1.15851	.139
week44	-3.89303	<.001	-2.2338	.069	-2.68881	.001
week45	-3.15094	<.001	-2.42255	.049	-1.80558	.019
week46	-4.09925	<.001	-2.68788	.028	-3.16673	<.001
week47	-3.91722	<.001	-3.82018	.002	-2.68421	.001
week48	-3.94812	<.001	-2.79304	.024	-2.82043	<.001
week49	-4.79151	<.001	-3.28679	.007	-3.83255	<.001
week5	-2.05188	<.001	-1.91287	.117	-1.30921	.082
week50	-4.68799	<.001	-3.55547	.003	-4.13892	<.001
week51	-5.127	<.001	-5.16595	<.001	-4.52561	<.001
week52	-2.94573	<.001	-2.01746	.084	-1.94728	.007
week53	.731607	.447	2.357619	.286	1.333275	.367
week6	-2.62099	<.001	-2.70221	.027	-1.75072	.020
week7	-2.76578	<.001	-2.65456	.030	-2.31339	.002
week8	-2.07374	<.001	-1.78106	.149	-1.80795	.018
week9	-2.81525	<.001	-3.33752	.007	-2.70203	<.001
date	-.00727	<.001	-.00745	<.001	-.00648	<.001
Country: Australia	-5.30861	<.001	-2.49805	.005	-3.8712	<.001
Country: Austria	-2.0924	.024	-2.32782	.304	-5.12388	<.001

Country: Bangladesh	2.179634	.001	1.337345	.211	3.67113	<.001
Country: Bulgaria	3.0469	<.001	5.422088	.001	5.603879	<.001
Country: Egypt	7.668776	<.001	6.914991	<.001	6.948214	<.001
Country: Estonia	-2.0779	<.001	-5.40459	<.001	-1.95552	.022
Country: Finland	-5.19714	<.001	-2.29962	.014	-3.93122	<.001
Country: India	9.819381	<.001	8.934931	<.001	1.093	<.001
Country: Indonesia	3.977762	<.001	4.551695	<.001	5.988433	<.001
Country: Italy	-3.20664	<.001	-1.88855	.007	-3.4022	<.001
Country: Latvia	1.198863	.020	-3.21044	.012	.564972	.456
Country: Lithuania	1.590805	<.001	1.334979	.157	.744904	.235
Country: Malaysia	3.254991	<.001	1.89959	<.001	3.149835	<.001
Country: Mexico	3.214764	<.001	4.581532	<.001	3.071288	<.001
Country: Nepal	5.082124	<.001	7.54514	<.001	2.657111	.104
Country: Netherlands	-2.20299	<.001	.113802	.932	-1.02248	.175
Country: Norway	-.97758	.022	-2.94439	.002	-.45733	.448
Country: Pakistan	9.452218	<.001	9.887747	<.001	9.017922	<.001
Country: Panama	-.4594	.629	.943362	.676	-.26866	.845
Country: Philippines	-3.9744	<.001	-1.88684	.048	-3.67958	<.001
Country: Poland	-3.21225	<.001	-3.20946	<.001	-2.32051	<.001
Country: Portugal	.131072	.732	1.531338	.079	-.14234	.792
Country: Romania	1.22904	.003	.574008	.536	2.260105	<.001
Country: Russia	-.20011	.789	2.031542	.197	1.312341	.197
Country: Singapore	.947614	.064	-2.6647	.042	-.11842	.902
Country: Sweden	-4.72234	<.001	-2.79506	.003	-4.51832	<.001
Country: Turkey	-.50349	.264	2.369512	.026	-1.29942	.059
Country: United Arab Emirates	4.208979	<.001	4.97793	<.001	6.504034	<.001
Country: United Kingdom	-3.49778	<.001	-1.51765	.106	-3.93039	<.001
Country: >1	5.106473	<.001	2.782952	.019	9.843469	<.001
Country: Venezuela	-1.39798	.059	2.181654	.217	-.75281	.438

Table 3: Average Book Rating (Model 1)

	All users		Only Gender		Only Age	
	Estimate	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**
(Intercept)	3.01386	<.001	3.29637	<.001	3.13173	<.001
CovidStringency	.00006	.005	.00016	.008	-.00002	.479
week10	-.02655	<.001	-.01862	.141	-.03274	<.001
week11	-.02699	<.001	-.01424	.256	-.02785	<.001
week12	-.02457	<.001	-.02787	.027	-.02225	.001
week13	-.02104	<.001	-.01835	.143	-.01931	.004
week14	-.02009	<.001	-.02551	.041	-.02235	.001
week15	-.02467	<.001	-.02172	.083	-.02972	<.001
week16	-.02434	<.001	-.01131	.369	-.01513	.027
week17	-.02184	<.001	-.01370	.275	-.02655	<.001
week18	-.02281	<.001	-.01445	.252	-.02287	.001
week19	-.02847	<.001	-.01050	.409	-.02578	<.001
week2	-.01157	.007	-.00761	.538	-.01462	.028
week20	-.02366	<.001	-.02400	.058	-.03381	<.001
week21	-.02421	<.001	-.01837	.145	-.03142	<.001
week22	-.01789	<.001	-.00005	.997	-.02461	<.001
week23	-.02693	<.001	-.01511	.232	-.03042	<.001
week24	-.02735	<.001	-.02717	.032	-.02835	<.001
week25	-.02025	<.001	-.02472	.051	-.02935	<.001
week26	-.02117	<.001	-.01694	.177	-.02511	<.001
week27	-.02120	<.001	-.02011	.110	-.02588	<.001
week28	-.02858	<.001	-.02543	.043	-.03455	<.001
week29	-.02394	<.001	-.01856	.138	-.02806	<.001
week3	-.01370	.001	-.00754	.544	-.01614	.016
week30	-.02517	<.001	-.03281	.009	-.03406	<.001
week31	-.02623	<.001	-.02107	.091	-.03262	<.001
week32	-.02922	<.001	-.01877	.133	-.03123	<.001
week33	-.02334	<.001	-.01849	.139	-.02673	<.001
week34	-.03174	<.001	-.01652	.187	-.03387	<.001
week35	-.03022	<.001	-.01999	.109	-.03098	<.001
week36	-.03025	<.001	-.02618	.037	-.03076	<.001
week37	-.02802	<.001	-.02933	.020	-.03650	<.001
week38	-.03566	<.001	-.03660	.004	-.03848	<.001
week39	-.02835	<.001	-.02204	.080	-.03052	<.001
week4	-.01548	<.001	-.00459	.711	-.02606	<.001
week40	-.02106	<.001	-.02181	.084	-.02188	.002
week41	-.03069	<.001	-.01778	.157	-.03372	<.001
week42	-.02292	<.001	-.00952	.449	-.02042	.003
week43	-.02506	<.001	-.01924	.125	-.02472	<.001
week44	-.01974	<.001	-.01313	.292	-.01832	.008
week45	-.01864	<.001	-.01018	.419	-.01783	.010
week46	-.02437	<.001	-.01363	.276	-.01998	.004
week47	-.02613	<.001	-.01342	.288	-.02830	<.001
week48	-.02533	<.001	-.00969	.437	-.02553	<.001
week49	-.02284	<.001	-.01181	.345	-.02384	.001
week5	-.01338	.002	-.00033	.979	-.01800	.007
week50	-.02680	<.001	-.01961	.114	-.02935	<.001
week51	-.01273	.003	-.00551	.654	-.01464	.032
week52	-.00417	.303	-.01125	.339	-.00519	.415
week53	.00294	.720	.01569	.479	-.00040	.975
week6	-.02832	<.001	-.02538	.043	-.03274	<.001
week7	-.02602	<.001	-.02564	.040	-.03475	<.001
week8	-.02310	<.001	-.00822	.509	-.02584	<.001
week9	-.02516	<.001	-.02162	.084	-.02514	<.001
date	.00005	<.001	.00003	<.001	.00004	<.001
Country: Australia	.07592	<.001	.03527	<.001	.11303	<.001
Country: Austria	.00244	.772	.02240	.362	-.13406	<.001

Country: Bangladesh	.01569	.003	.04487	<.001	.00650	.435
Country: Bulgaria	.08697	<.001	.20687	<.001	.02503	.001
Country: Egypt	-.19191	<.001	-.18917	<.001	-.22341	<.001
Country: Estonia	.04096	<.001	.14842	<.001	.01837	.017
Country: Finland	-.24950	<.001	-.16331	<.001	-.24927	<.001
Country: India	.05022	<.001	.15483	<.001	.05993	<.001
Country: Indonesia	.01130	<.001	.10820	<.001	.02208	<.001
Country: Italy	-.04937	<.001	-.01813	.011	-.06017	<.001
Country: Latvia	.02036	<.001	-.01475	.266	-.02343	.001
Country: Lithuania	.11469	<.001	.10318	<.001	.10084	<.001
Country: Malaysia	.05587	<.001	.12151	<.001	.04733	<.001
Country: Mexico	.07275	<.001	.08485	<.001	.06183	<.001
Country: Nepal	-.03487	<.001	.02751	.185	-.03077	.028
Country: Netherlands	-.12124	<.001	-.03039	.026	-.15053	<.001
Country: Norway	.03051	<.001	.05488	<.001	-.00926	.090
Country: Pakistan	.03118	<.001	.08038	<.001	.04624	<.001
Country: Panama	.03657	<.001	.09154	<.001	.01954	.108
Country: Philippines	.11190	<.001	.10950	<.001	.12758	<.001
Country: Poland	-.08373	<.001	-.10589	<.001	-.11017	<.001
Country: Portugal	.06841	<.001	.10148	<.001	.06503	<.001
Country: Romania	.14404	<.001	.16891	<.001	.12022	<.001
Country: Russia	.09419	<.001	.12665	<.001	.06909	<.001
Country: Singapore	.03040	<.001	.03235	.015	.09727	<.001
Country: Sweden	-.18917	<.001	-.16742	<.001	-.19147	<.001
Country: Turkey	.11782	<.001	.09109	<.001	.11034	<.001
Country: United Arab Emirates	-.06481	<.001	.02825	.041	-.07699	<.001
Country: United Kingdom	.10546	<.001	.22928	<.001	.11095	<.001
Country: >1	-.03292	<.001	-.00036	.976	-.06650	<.001
Country: Venezuela	.07982	<.001	.15592	<.001	.09993	<.001

Table 4: Average Number of Pages per Book (Model 1)

	All users		Only Gender		Only Age	
	Estimate	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**
(Intercept)	431.89	<.001	422.87	<.001	425.05	<.001
CovidStringency	.07	<.001	.08	<.001	.07	<.001
week10	-4.29	<.001	-3.61	.122	-5.41	<.001
week11	-5.40	<.001	-4.28	.064	-6.73	<.001
week12	-4.31	<.001	-3.51	.130	-5.11	<.001
week13	-2.20	.005	-1.89	.413	-3.46	.006
week14	-2.57	.001	-3.62	.118	-3.79	.003
week15	-3.02	<.001	-.68	.770	-3.60	.004
week16	-3.99	<.001	-2.58	.266	-5.63	<.001
week17	-4.50	<.001	-2.96	.201	-6.19	<.001
week18	-1.76	.027	-1.36	.560	-2.84	.026
week19	-3.68	<.001	-.94	.690	-5.54	<.001
week2	-1.67	.031	.88	.700	-3.50	.005
week20	-3.79	<.001	-2.56	.273	-4.92	<.001
week21	-3.68	<.001	-.43	.855	-4.99	<.001
week22	-1.97	.013	-.10	.967	-4.07	.001
week23	-1.70	.034	.03	.988	-1.61	.208
week24	-1.17	.146	-1.95	.406	-.76	.552
week25	-2.28	.004	-3.21	.169	-4.27	.001
week26	.03	.974	2.15	.355	-1.03	.417
week27	.01	.990	2.56	.270	-.44	.727
week28	-.11	.889	1.45	.531	-1.65	.193
week29	-.28	.719	.62	.787	-2.57	.041
week3	-2.29	.003	-1.18	.605	-3.82	.002
week30	1.25	.112	.96	.676	.95	.452
week31	1.06	.175	2.19	.341	.41	.747
week32	-.73	.357	-2.39	.299	-1.63	.197
week33	-.95	.226	.37	.874	-2.58	.041
week34	-2.29	.004	-.25	.915	-2.89	.022
week35	.39	.624	4.57	.047	-1.75	.166
week36	-2.25	.005	-4.83	.037	-3.75	.003
week37	-2.17	.007	-.30	.898	-2.78	.029
week38	-2.14	.007	-1.34	.564	-2.64	.040
week39	-2.77	.001	-3.86	.097	-5.00	<.001
week4	-4.12	<.001	-3.02	.188	-5.82	<.001
week40	-2.63	.001	-1.78	.445	-4.26	.001
week41	-3.62	<.001	-3.51	.130	-5.18	<.001
week42	-3.80	<.001	-6.53	.005	-4.94	<.001
week43	-5.04	<.001	-3.17	.171	-6.04	<.001
week44	-3.62	<.001	-1.57	.496	-5.86	<.001
week45	-5.94	<.001	-2.86	.218	-6.93	<.001
week46	-6.33	<.001	-6.06	.009	-7.15	<.001
week47	-6.76	<.001	-3.88	.096	-7.39	<.001
week48	-7.26	<.001	-7.39	.001	-8.13	<.001
week49	-8.83	<.001	-7.95	.001	-11.13	<.001
week5	-4.00	<.001	-.67	.769	-4.61	<.001
week50	-1.89	<.001	-9.61	<.001	-12.03	<.001
week51	-12.36	<.001	-12.56	<.001	-14.51	<.001
week52	-5.40	<.001	-8.60	<.001	-6.98	<.001
week53	-.89	.551	-2.11	.605	-3.35	.165
week6	-4.67	<.001	-1.12	.629	-5.16	<.001
week7	-5.54	<.001	-3.57	.122	-6.92	<.001
week8	-5.73	<.001	-4.75	.039	-6.83	<.001
week9	-4.29	<.001	-1.97	.394	-5.08	<.001
date	-.01	<.001	-.01	<.001	-.01	<.001
Country: Australia	33.00	<.001	4.35	<.001	27.73	<.001
Country: Austria	32.92	<.001	2.75	<.001	25.83	<.001

Country: Bangladesh	-3.38	<.001	-4.71	<.001	-35.39	<.001
Country: Bulgaria	33.31	<.001	27.81	<.001	26.92	<.001
Country: Egypt	-32.44	<.001	-4.08	<.001	-42.19	<.001
Country: Estonia	.83	.343	-12.92	<.001	-7.00	<.001
Country: Finland	11.09	<.001	9.28	<.001	-.86	.393
Country: India	19.71	<.001	18.28	<.001	14.92	<.001
Country: Indonesia	5.66	<.001	9.55	<.001	2.67	.003
Country: Italy	7.10	<.001	2.83	.032	.53	.497
Country: Latvia	22.00	<.001	21.81	<.001	21.44	<.001
Country: Lithuania	3.49	<.001	3.43	<.001	23.39	<.001
Country: Malaysia	16.25	<.001	11.72	<.001	4.87	<.001
Country: Mexico	6.28	<.001	11.97	<.001	.65	.474
Country: Nepal	6.49	<.001	-7.19	.059	8.14	.001
Country: Netherlands	17.38	<.001	4.31	.090	12.88	<.001
Country: Norway	24.35	<.001	14.30	<.001	16.01	<.001
Country: Pakistan	35.47	<.001	35.94	<.001	4.07	<.001
Country: Panama	22.67	<.001	22.37	<.001	16.06	<.001
Country: Philippines	15.01	<.001	21.30	<.001	12.44	<.001
Country: Poland	46.42	<.001	49.66	<.001	4.59	<.001
Country: Portugal	12.59	<.001	4.35	.008	6.98	<.001
Country: Romania	26.56	<.001	23.36	<.001	19.42	<.001
Country: Russia	49.55	<.001	5.92	<.001	53.65	<.001
Country: Singapore	15.35	<.001	25.78	<.001	9.89	<.001
Country: Sweden	21.64	<.001	12.39	<.001	14.09	<.001
Country: Turkey	-21.67	<.001	-32.18	<.001	-25.25	<.001
Country: United Arab Emirates	5.65	<.001	5.56	.029	-.20	.901
Country: United Kingdom	36.35	<.001	22.17	<.001	28.46	<.001
Country: >1	2.59	.003	-16.26	<.001	-9.42	<.001
Country: Venezuela	2.19	<.001	11.60	.001	18.74	<.001

Table 5: % Nostalgic Books Added per Week (Model 1)

	All users		Only Gender		Only Age	
	Estimate	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**
(Intercept)	.31397	<.001	.24554	<.001	.20758	<.001
CovidStringency	-.00003	.001	-.00016	<.001	-.00010	<.001
week10	-.00336	.106	-.01586	.009	-.00415	.203
week11	-.00092	.658	-.01097	.068	-.00603	.064
week12	-.00119	.565	-.00907	.132	-.00465	.153
week13	-.00349	.090	-.00743	.216	-.00831	.010
week14	.00145	.482	-.00339	.571	-.00285	.379
week15	-.00228	.270	-.00142	.813	-.00253	.435
week16	-.00114	.580	-.00719	.233	-.00390	.231
week17	-.00294	.157	-.00698	.246	-.00683	.036
week18	-.00670	.001	-.01057	.081	-.00929	.004
week19	-.00516	.014	-.00803	.188	-.00730	.027
week2	.00207	.306	-.00918	.121	-.00233	.463
week20	-.00849	<.001	-.01713	.005	-.01172	<.001
week21	-.00675	.001	-.00911	.133	-.00952	.004
week22	-.00997	<.001	-.01269	.036	-.01379	<.001
week23	-.00754	<.001	-.01851	.002	-.01380	<.001
week24	-.00999	<.001	-.01605	.008	-.01212	<.001
week25	-.00910	<.001	-.01297	.032	-.01079	.001
week26	-.00741	<.001	-.00994	.099	-.01164	<.001
week27	-.00799	<.001	-.01256	.037	-.01284	<.001
week28	-.00695	.001	-.01184	.049	-.01095	.001
week29	-.00502	.015	-.01496	.013	-.00737	.023
week3	.00389	.055	-.00761	.200	-.00039	.902
week30	-.00530	.010	-.00679	.256	-.00947	.003
week31	-.00312	.129	.00024	.968	-.00600	.064
week32	-.00354	.086	-.00215	.720	-.00392	.227
week33	-.00340	.099	-.00629	.293	-.00517	.111
week34	-.00223	.280	-.00577	.335	-.00317	.329
week35	-.00392	.058	-.00492	.411	-.00512	.115
week36	-.00956	<.001	-.02135	<.001	-.01401	<.001
week37	-.00482	.021	-.00866	.151	-.00926	.005
week38	-.01276	<.001	-.01649	.006	-.01684	<.001
week39	-.01515	<.001	-.01319	.029	-.01509	<.001
week4	.00202	.319	-.00640	.281	-.00355	.264
week40	-.01113	<.001	-.01499	.013	-.01345	<.001
week41	-.01104	<.001	-.00679	.260	-.01240	<.001
week42	-.01292	<.001	-.01152	.056	-.01567	<.001
week43	-.01690	<.001	-.02112	<.001	-.01960	<.001
week44	-.02222	<.001	-.02490	<.001	-.02812	<.001
week45	-.01834	<.001	-.02753	<.001	-.02352	<.001
week46	-.01824	<.001	-.02442	<.001	-.02115	<.001
week47	-.02003	<.001	-.02282	<.001	-.02122	<.001
week48	-.02037	<.001	-.02473	<.001	-.02143	<.001
week49	-.02669	<.001	-.03345	<.001	-.03090	<.001
week5	.00047	.816	.00019	.974	.00001	.999
week50	-.02027	<.001	-.01852	.002	-.02428	<.001
week51	-.01894	<.001	-.02089	<.001	-.02063	<.001
week52	-.01297	<.001	-.02103	<.001	-.01202	<.001
week53	-.00866	.026	-.00582	.584	-.00649	.296
week6	-.00170	.406	-.01031	.085	-.00444	.166
week7	.00039	.850	-.01097	.067	-.00165	.607
week8	-.00046	.823	-.00719	.229	-.00661	.040
week9	-.00478	.020	-.01297	.031	-.00847	.009
date	.00000	<.001	.00001	<.001	.00001	<.001
Country: Australia	-.16889	<.001	-.13506	<.001	-.14747	<.001
Country: Austria	-.07502	<.001	-.01380	.222	-.06795	<.001

Country: Bangladesh	.06905	<.001	.12383	<.001	.09555	<.001
Country: Bulgaria	.01845	<.001	.01884	.018	.02931	<.001
Country: Egypt	.05387	<.001	.11499	<.001	.09408	<.001
Country: Estonia	-.05121	<.001	-.02013	.003	-.02350	<.001
Country: Finland	-.09715	<.001	-.09004	<.001	-.07065	<.001
Country: India	-.02633	<.001	-.00188	.617	.00216	.334
Country: Indonesia	-.12095	<.001	-.09652	<.001	-.09718	<.001
Country: Italy	-.00507	<.001	.03367	<.001	.01295	<.001
Country: Latvia	-.03763	<.001	-.05457	<.001	-.00926	.005
Country: Lithuania	.01224	<.001	.03776	<.001	.04670	<.001
Country: Malaysia	-.13588	<.001	-.07246	<.001	-.10204	<.001
Country: Mexico	.00615	<.001	.02570	<.001	.02496	<.001
Country: Nepal	-.00055	.885	.03293	.001	.00879	.177
Country: Netherlands	-.08299	<.001	-.01393	.035	-.07113	<.001
Country: Norway	-.11470	<.001	-.12059	<.001	-.10321	<.001
Country: Pakistan	-.03574	<.001	-.01413	.005	-.00171	.633
Country: Panama	-.12133	<.001	-.08738	<.001	-.11043	<.001
Country: Philippines	-.16439	<.001	-.12987	<.001	-.16017	<.001
Country: Poland	-.08659	<.001	-.07098	<.001	-.06945	<.001
Country: Portugal	-.05167	<.001	-.02666	<.001	-.05107	<.001
Country: Romania	-.00388	.023	.00519	.245	-.00140	.589
Country: Russia	.03283	<.001	.12063	<.001	.05823	<.001
Country: Singapore	-.12322	<.001	-.13854	<.001	-.10847	<.001
Country: Sweden	-.11353	<.001	-.07879	<.001	-.09286	<.001
Country: Turkey	.05388	<.001	.09154	<.001	.07518	<.001
Country: United Arab Emirates	-.06019	<.001	-.05243	<.001	-.03368	<.001
Country: United Kingdom	-.15237	<.001	-.09625	<.001	-.13291	<.001
Country: >1	-.02623	<.001	.01187	.038	-.00886	.011
Country: Venezuela	-.04444	<.001	.01410	.103	-.03716	<.001

Table 6: % Recently Published Books Added per Week (Model 1)

	All users		Only Gender		Only Age	
	Estimate	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**
(Intercept)	.164631	<.001	.086104	<.001	.261973	<.001
CovidStringency	-.000130	<.001	-.000051	.033	-.000041	.008
week10	.020588	<.001	.030208	<.001	.021991	<.001
week11	.017560	<.001	.022804	<.001	.018102	<.001
week12	.014975	<.001	.019017	<.001	.015909	<.001
week13	.020654	<.001	.028908	<.001	.022337	<.001
week14	.018014	<.001	.025829	<.001	.019953	<.001
week15	.021127	<.001	.022541	<.001	.019299	<.001
week16	.020474	<.001	.022926	<.001	.021827	<.001
week17	.029614	<.001	.029136	<.001	.028848	<.001
week18	.034880	<.001	.035737	<.001	.036043	<.001
week19	.034085	<.001	.035716	<.001	.036474	<.001
week2	-.001284	.482	.008892	.075	.000313	.914
week20	.037574	<.001	.044599	<.001	.037838	<.001
week21	.038750	<.001	.041897	<.001	.041533	<.001
week22	.040902	<.001	.044629	<.001	.041025	<.001
week23	.039304	<.001	.047082	<.001	.043737	<.001
week24	.044108	<.001	.050803	<.001	.046515	<.001
week25	.041385	<.001	.046476	<.001	.042766	<.001
week26	.045716	<.001	.046412	<.001	.049562	<.001
week27	.042916	<.001	.041964	<.001	.044225	<.001
week28	.042291	<.001	.043472	<.001	.042824	<.001
week29	.039290	<.001	.042059	<.001	.039671	<.001
week3	-.001128	.538	.011069	.028	.002591	.372
week30	.041097	<.001	.038436	<.001	.039532	<.001
week31	.044853	<.001	.038876	<.001	.044992	<.001
week32	.042127	<.001	.038764	<.001	.042572	<.001
week33	.041939	<.001	.038419	<.001	.040705	<.001
week34	.044665	<.001	.043437	<.001	.045304	<.001
week35	.050729	<.001	.046886	<.001	.048029	<.001
week36	.053604	<.001	.053411	<.001	.055277	<.001
week37	.056538	<.001	.058245	<.001	.055867	<.001
week38	.060638	<.001	.065276	<.001	.061710	<.001
week39	.066841	<.001	.064648	<.001	.068294	<.001
week4	.002962	.105	.011904	.018	.002595	.370
week40	.065110	<.001	.060598	<.001	.063344	<.001
week41	.068919	<.001	.061600	<.001	.067373	<.001
week42	.069084	<.001	.065713	<.001	.071327	<.001
week43	.075427	<.001	.072645	<.001	.075495	<.001
week44	.084157	<.001	.076881	<.001	.086362	<.001
week45	.082072	<.001	.085908	<.001	.086808	<.001
week46	.083961	<.001	.082998	<.001	.087585	<.001
week47	.077275	<.001	.068589	<.001	.077945	<.001
week48	.081035	<.001	.071297	<.001	.081574	<.001
week49	.087006	<.001	.079213	<.001	.084614	<.001
week5	.008555	<.001	.014459	.004	.008606	.003
week50	.075103	<.001	.061630	<.001	.073785	<.001
week51	.072827	<.001	.061692	<.001	.070692	<.001
week52	.045501	<.001	.046641	<.001	.044981	<.001
week53	.009549	.007	.011910	.185	.007986	.159
week6	.007487	<.001	.016840	.001	.008924	.002
week7	.010265	<.001	.022105	<.001	.009753	.001
week8	.011932	<.001	.015287	.002	.012164	<.001
week9	.016814	<.001	.026820	<.001	.018336	<.001
date	-.000001	<.001	.000003	.001	-.000007	<.001
Country: Australia	.228564	<.001	.191333	<.001	.217479	<.001
Country: Austria	.055087	<.001	.002712	.777	.058395	<.001

Country: Bangladesh	-.019909	<.001	-.053392	<.001	-.030831	<.001
Country: Bulgaria	-.019050	<.001	-.026350	<.001	-.012301	<.001
Country: Egypt	-.029337	<.001	-.074108	<.001	-.045636	<.001
Country: Estonia	.028694	<.001	.024924	<.001	.036326	<.001
Country: Finland	.091346	<.001	.091021	<.001	.080009	<.001
Country: India	.035363	<.001	.019735	<.001	.028459	<.001
Country: Indonesia	.093128	<.001	.059897	<.001	.086258	<.001
Country: Italy	.019328	<.001	-.013125	<.001	.015046	<.001
Country: Latvia	-.006242	.001	.021575	<.001	-.005096	.087
Country: Lithuania	-.042302	<.001	-.049076	<.001	-.047631	<.001
Country: Malaysia	.116374	<.001	.048720	<.001	.103530	<.001
Country: Mexico	-.022931	<.001	-.043017	<.001	-.027145	<.001
Country: Nepal	.012441	<.001	-.039217	<.001	.036482	<.001
Country: Netherlands	.089563	<.001	.061011	<.001	.099807	<.001
Country: Norway	.100549	<.001	.111312	<.001	.110610	<.001
Country: Pakistan	.039873	<.001	.020547	<.001	.021266	<.001
Country: Panama	.094089	<.001	.040359	<.001	.084475	<.001
Country: Philippines	.179062	<.001	.126110	<.001	.183947	<.001
Country: Poland	.076334	<.001	.059704	<.001	.076485	<.001
Country: Portugal	.032037	<.001	.001603	.657	.050859	<.001
Country: Romania	-.030869	<.001	-.024943	<.001	-.007944	.001
Country: Russia	-.025066	<.001	-.095400	<.001	-.033135	<.001
Country: Singapore	.116121	<.001	.130231	<.001	.119828	<.001
Country: Sweden	.104977	<.001	.067021	<.001	.096744	<.001
Country: Turkey	-.074324	<.001	-.110690	<.001	-.084630	<.001
Country: United Arab Emirates	.053223	<.001	.043649	<.001	.028683	<.001
Country: United Kingdom	.196798	<.001	.155770	<.001	.191625	<.001
Country: >1	.028417	<.001	.002427	.616	.028590	<.001
Country: Venezuela	.005583	.044	-.049596	<.001	.014001	<.001

Appendix B: Robustness Check of Model 3

Table 1: Estimates of Model 3 (Book Consumption per Date Started)

	Number of Books started		Days per book		Rating	
Variable	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**
(Intercept)	-.05443	.963	151.95018	<.001	2.92812	<.001
Covid-19 Stringency	.00230	<.001	-.03522	<.001	.00013	<.001
week10	-.12820	<.001	-2.09873	<.001	-.02425	<.001
week11	-.13296	<.001	-2.15470	<.001	-.01953	<.001
week12	-.14007	<.001	-1.90409	<.001	-.01705	<.001
week13	-.19167	<.001	-2.02084	<.001	-.01766	<.001
week14	-.13153	<.001	-1.80622	<.001	-.02086	<.001
week15	-.13459	<.001	-2.25373	<.001	-.02101	<.001
week16	-.14448	<.001	-1.61743	.001	-.02123	<.001
week17	-.19527	<.001	-.93055	.053	-.02038	<.001
week18	-.16509	<.001	-1.96987	<.001	-.02590	<.001
week19	-.15220	<.001	-2.58189	<.001	-.02582	<.001
week2	-.05709	<.001	-1.00391	.026	-.01160	.010
week20	-.15671	<.001	-2.26492	<.001	-.02566	<.001
week21	-.17040	<.001	-1.74523	<.001	-.02200	<.001
week22	-.19674	<.001	-2.71123	<.001	-.01705	<.001
week23	-.14845	<.001	-2.72142	<.001	-.02794	<.001
week24	-.15130	<.001	-2.56333	<.001	-.02274	<.001
week25	-.15316	<.001	-2.14608	<.001	-.01374	.003
week26	-.20471	<.001	-3.16364	<.001	-.01756	<.001
week27	-.13062	<.001	-2.87411	<.001	-.01849	<.001
week28	-.12803	<.001	-2.97171	<.001	-.01839	<.001
week29	-.11954	<.001	-3.43530	<.001	-.01621	<.001
week3	-.07798	<.001	-1.41536	.002	-.01719	<.001
week30	-.16699	<.001	-2.27993	<.001	-.02660	<.001
week31	-.13531	<.001	-2.97683	<.001	-.01887	<.001
week32	-.11818	<.001	-3.36432	<.001	-.02094	<.001
week33	-.12163	<.001	-2.15388	<.001	-.02250	<.001
week34	-.14030	<.001	-.86770	.064	-.03013	<.001
week35	-.19236	<.001	-1.60427	.001	-.03480	<.001
week36	-.14205	<.001	-1.70717	<.001	-.02718	<.001
week37	-.14818	<.001	-1.97226	<.001	-.02472	<.001
week38	-.15931	<.001	-1.56932	.001	-.03769	<.001
week39	-.20633	<.001	-1.63001	.001	-.03152	<.001
week4	-.11268	<.001	-.26449	.569	-.01877	<.001
week40	-.16087	<.001	-2.45266	<.001	-.02619	<.001
week41	-.14979	<.001	-2.66352	<.001	-.02248	<.001
week42	-.15059	<.001	-2.01093	<.001	-.02297	<.001
week43	-.18755	<.001	-2.02053	<.001	-.03190	<.001
week44	-.17312	<.001	-3.15349	<.001	-.02746	<.001
week45	-.14520	<.001	-2.66796	<.001	-.02105	<.001
week46	-.14935	<.001	-3.58615	<.001	-.02416	<.001
week47	-.16792	<.001	-3.46184	<.001	-.02806	<.001

week48	-.19461	<.001	-4.33321	<.001	-.03332	<.001
week49	-.13349	<.001	-4.95414	<.001	-.02870	<.001
week5	-.11714	<.001	-1.38257	.003	-.01229	.007
week50	-.11892	<.001	-4.68868	<.001	-.02422	<.001
week51	-.08400	<.001	-5.77089	<.001	-.00458	.316
week52	-.00099	.792	-2.26690	<.001	.00029	.948
week53	-.07923	<.001	2.35341	.010	.01457	.109
week6	-.09246	<.001	-2.03889	<.001	-.02459	<.001
week7	-.09631	<.001	-2.20953	<.001	-.01933	<.001
week8	-.13960	<.001	-1.18934	.011	-.02377	<.001
week9	-.14566	<.001	-1.82521	<.001	-.02102	<.001
date	.00000	<.001	-.00698	<.001	.00005	<.001
CountryAustralia	.77331	.506	-5.22429	<.001	.06811	<.001
CountryAustria	.67956	.559	-2.73919	.001	-.02121	.013
CountryBangladesh	.57585	.621	2.09257	<.001	.00305	.602
CountryBulgaria	.47143	.685	3.07397	<.001	.07892	<.001
CountryEgypt	.42037	.718	7.65370	<.001	-.18469	<.001
CountryEstonia	.61365	.598	-2.17695	<.001	.04184	<.001
CountryFinland	.79127	.497	-4.83465	<.001	-.24654	<.001
CountryIndia	.37632	.746	9.36173	<.001	.04295	<.001
CountryIndonesia	.45918	.693	3.35110	<.001	.00615	.075
CountryItaly	.58213	.617	-3.46672	<.001	-.06262	<.001
CountryLatvia	.48317	.678	1.08568	.024	.00424	.372
CountryLithuania	.45593	.695	1.32677	<.001	.10546	<.001
CountryMalaysia	.50243	.666	3.08363	<.001	.05589	<.001
CountryMexico	.46661	.688	3.23525	<.001	.07816	<.001
CountryNepal	.34208	.769	4.77431	<.001	-.01563	.093
CountryNetherlands	.60633	.602	-2.26501	<.001	-.13528	<.001
CountryNorway	.63251	.587	-.85297	.032	.02192	<.001
CountryPakistan	.40074	.731	8.84386	<.001	.02682	<.001
CountryPanama	.46014	.693	-.28303	.752	.04531	<.001
CountryPhilippines	.50916	.662	-4.12923	<.001	.11274	<.001
CountryPoland	.72440	.534	-3.35559	<.001	-.08076	<.001
CountryPortugal	.50194	.666	-.01659	.963	.06628	<.001
CountryRomania	.51609	.657	1.13358	.004	.14619	<.001
CountryRussia	.55247	.635	-.33729	.632	.07738	<.001
CountrySingapore	.48647	.676	1.05817	.027	.02285	<.001
CountrySweden	.72797	.532	-4.31682	<.001	-.18741	<.001
CountryTurkey	.53947	.643	-.77224	.067	.10832	<.001
CountryUnited Arab Emirates	.46932	.687	4.60556	<.001	-.06604	<.001
CountryUnited Kingdom	.68517	.556	-3.54728	<.001	.09327	<.001
Country >1	.65645	.573	5.23208	<.001	-.04979	<.001
CountryVenezuela	.54441	.640	-2.09897	.002	.06501	<.001

Table 2: Estimates of Model 3 (Book Consumption per Date Started)

	Book length		% Nostalgic		% Recent Published	
Variable	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**	**Estimate**	**Pr(>|t|)**
(Intercept)	49.21689	<.001	.18670	<.001	.29279	<.001
Covid-19 Stringency	.12239	<.001	-.00011	<.001	-.00015	<.001
week10	-5.03428	<.001	-.00010	.964	.02179	<.001
week11	-5.37336	<.001	-.00152	.492	.02315	<.001
week12	-5.48213	<.001	.00128	.565	.02008	<.001
week13	-4.96688	<.001	-.00197	.387	.02227	<.001
week14	-2.84106	.001	.00387	.079	.02431	<.001
week15	-3.34157	<.001	.00163	.460	.02608	<.001
week16	-5.49436	<.001	.00199	.371	.02822	<.001
week17	-7.79029	<.001	-.00016	.945	.03160	<.001
week18	-3.37422	<.001	-.00496	.027	.04260	<.001
week19	-5.08260	<.001	-.00214	.341	.03789	<.001
week2	-3.46225	<.001	.00309	.153	-.00062	.747
week20	-5.02957	<.001	-.00539	.017	.04281	<.001
week21	-5.34598	<.001	-.00690	.002	.04803	<.001
week22	-3.19813	<.001	-.00821	<.001	.04807	<.001
week23	-4.22338	<.001	-.00310	.166	.04474	<.001
week24	-1.81300	.032	-.00457	.042	.04826	<.001
week25	-3.02052	<.001	-.00832	<.001	.04832	<.001
week26	-2.45627	.005	-.00473	.039	.05220	<.001
week27	-.37985	.649	-.00783	<.001	.05151	<.001
week28	-.28973	.728	-.00724	.001	.05558	<.001
week29	-1.16006	.163	-.00411	.063	.04969	<.001
week3	-4.21326	<.001	.00227	.297	.00055	.777
week30	-1.59346	.060	-.00395	.079	.05252	<.001
week31	1.09393	.190	-.00315	.155	.05610	<.001
week32	-.29504	.722	-.00208	.345	.05145	<.001
week33	-1.15048	.166	-.00234	.287	.05244	<.001
week34	-4.15871	<.001	-.00470	.035	.05511	<.001
week35	-3.01711	<.001	-.00395	.084	.05907	<.001
week36	-3.53312	<.001	-.00872	<.001	.06590	<.001
week37	-2.88684	.001	-.00480	.032	.07069	<.001
week38	-4.31646	<.001	-.01049	<.001	.07445	<.001
week39	-5.39817	<.001	-.01306	<.001	.07848	<.001
week4	-7.15291	<.001	.00429	.053	.00139	.481
week40	-3.18678	<.001	-.01127	<.001	.08023	<.001
week41	-5.10910	<.001	-.00980	<.001	.08185	<.001
week42	-5.84749	<.001	-.01185	<.001	.08524	<.001
week43	-7.78489	<.001	-.01570	<.001	.09135	<.001
week44	-7.34430	<.001	-.01691	<.001	.09475	<.001
week45	-7.31177	<.001	-.01724	<.001	.09921	<.001
week46	-7.15196	<.001	-.01713	<.001	.10295	<.001
week47	-9.24809	<.001	-.01901	<.001	.09783	<.001
week48	-12.50335	<.001	-.01942	<.001	.09998	<.001
week49	-12.36271	<.001	-.01797	<.001	.09831	<.001

week5	-5.43323	<.001	.00051	.817	.00817	<.001
week50	-13.42183	<.001	-.01835	<.001	.09697	<.001
week51	-17.03918	<.001	-.02068	<.001	.10118	<.001
week52	-1.83883	<.001	-.01640	<.001	.06979	<.001
week53	-1.35422	.414	.00127	.773	.00629	.111
week6	-6.24403	<.001	-.00216	.323	.00921	<.001
week7	-6.79268	<.001	.00101	.646	.01076	<.001
week8	-7.56149	<.001	.00064	.774	.01582	<.001
week9	-6.43048	<.001	-.00294	.189	.01965	<.001
date	-.00988	<.001	.00001	<.001	-.00001	<.001
CountryAustralia	29.47476	<.001	-.16407	<.001	.21942	<.001
CountryAustria	34.19939	<.001	-.05795	<.001	.03910	<.001
CountryBangladesh	-34.16806	<.001	.06148	<.001	-.00737	.004
CountryBulgaria	34.05691	<.001	.02278	<.001	-.02395	<.001
CountryEgypt	-37.69883	<.001	.07553	<.001	-.03808	<.001
CountryEstonia	-1.44184	.125	-.05322	<.001	.02911	<.001
CountryFinland	11.25987	<.001	-.09840	<.001	.09251	<.001
CountryIndia	14.44059	<.001	-.01804	<.001	.03465	<.001
CountryIndonesia	3.22947	<.001	-.11761	<.001	.08620	<.001
CountryItaly	3.99850	<.001	.00176	.239	.01822	<.001
CountryLatvia	18.85833	<.001	-.04006	<.001	-.00313	.132
CountryLithuania	28.46365	<.001	.00696	<.001	-.03903	<.001
CountryMalaysia	11.35351	<.001	-.13387	<.001	.11313	<.001
CountryMexico	5.58543	<.001	.00976	<.001	-.02464	<.001
CountryNepal	3.90517	.019	-.00010	.982	.01200	.002
CountryNetherlands	15.28981	<.001	-.08701	<.001	.08650	<.001
CountryNorway	21.38992	<.001	-.11530	<.001	.10325	<.001
CountryPakistan	31.53088	<.001	-.04490	<.001	.05408	<.001
CountryPanama	21.08041	<.001	-.11075	<.001	.08079	<.001
CountryPhilippines	12.61840	<.001	-.15896	<.001	.16734	<.001
CountryPoland	45.70128	<.001	-.08483	<.001	.07727	<.001
CountryPortugal	13.10739	<.001	-.05065	<.001	.02580	<.001
CountryRomania	24.16301	<.001	-.00052	.780	-.03040	<.001
CountryRussia	48.63873	<.001	.04036	<.001	-.02676	<.001
CountrySingapore	14.86442	<.001	-.12367	<.001	.11878	<.001
CountrySweden	2.40553	<.001	-.11638	<.001	.10409	<.001
CountryTurkey	-27.62750	<.001	.06206	<.001	-.07411	<.001
CountryUnited Arab Emirates	4.27455	<.001	-.06025	<.001	.05417	<.001
CountryUnited Kingdom	32.99839	<.001	-.14398	<.001	.18993	<.001
CountryUNKNOWN	.94191	.321	-.02020	<.001	.01871	<.001
CountryVenezuela	21.53063	<.001	-.04880	<.001	.00352	.230

Model Fit of Model 3

Model fit Number of Books started per week

```
Residual standard error: 1.164 on 10224507 degrees of freedom
Multiple R-squared:  0.0142,    Adjusted R-squared:  0.01419
F-statistic:  1712 on 86 and 10224507 DF,  p-value: < 2.2e-16
```

Model fit Number of Days to finish a book

```
Residual standard error: 89.88 on 3464328 degrees of freedom
Multiple R-squared:  0.008159,  Adjusted R-squared:  0.008135
F-statistic: 335.3 on 85 and 3464328 DF,  p-value: < 2.2e-16
```

Model fit Rating

```
Residual standard error: 0.8721 on 3341863 degrees of freedom
Multiple R-squared:  0.01556,   Adjusted R-squared:  0.01554
F-statistic: 621.5 on 85 and 3341863 DF,  p-value: < 2.2e-16
```

Model fit Length

```
Residual standard error: 162.1 on 3479885 degrees of freedom
Multiple R-squared:  0.01379,   Adjusted R-squared:  0.01376
F-statistic: 572.3 on 85 and 3479885 DF,  p-value: < 2.2e-16
```

Model fit Percentage of Nostalgic Books Started

```
Residual standard error: 0.4244 on 3376247 degrees of freedom
Multiple R-squared:  0.02742,   Adjusted R-squared:  0.0274
F-statistic:  1120 on 85 and 3376247 DF,  p-value: < 2.2e-16
```

Model fit Percentage of Recent Published books Started

```
Residual standard error: 0.3794 on 3376247 degrees of freedom
Multiple R-squared:  0.04778,   Adjusted R-squared:  0.04775
F-statistic:  1993 on 85 and 3376247 DF,  p-value: < 2.2e-16
```