



**Supply and consumption diversity of NPO's genres
on linear TV and on demand**

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Abstract

Over the last few decades, the process of platformisation has been acknowledged and researched more often, including its impact on public service media (PSM). The Dutch public broadcaster, NPO (Nederlandse Publieke Omroep), has adjusted accordingly to the digitisation of services by offering their on demand service, NPO Start. While doing so, NPO maintains a public task of reaching different audience groups by maintaining the public values diversity and pluriformity. Therefore, it is significant to analyse whether NPO meets their audience's demands by offering diverse content. Hence, this research aims to analyse whether the supply and consumption diversity of NPO have changed between linear TV and on demand over the last four years with regards to their genres. This is especially significant within these times, in which the media landscape is altering continuously and rapidly and NPO strives to remain relevant to their audience. In order to analyse this, the operationalisation conducted by van der Wurff (2004) is adopted by implementing the concepts of *open diversity-as-sent*, *open diversity-as-received*, *reflective diversity*, *intra-channel diversity*, and *inter-channel diversity*. Here, the competition of channels is also crucial to reflect on, as this influences what the audience watches. The results suggest that there are differences in consumption diversity between linear TV and on demand as well as between prime time and daytime. This is related to the channel diversity, which emphasises NPO's policy in which certain audience groups are aimed to be reached on particular channels and during particular time frames. It is crucial to continuously analyse whether current adjustments in their policies meet their audience's demands in order to remain relevant and maintain social welfare.

Keywords: competition, open diversity, diversity-as-received, diversity-as-sent, reflective diversity, genre diversity, public service media

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1 Introduction

1.1 Motivation and context

Over the past decades, the media landscape has been altering continuously due to platformisation, especially with regards to digital platforms. This includes the operationalisation of public service media (PSM) and how they realise their prominent public values (van Es & Poell, 2020). This has also been the case in the Netherlands, where the Dutch public broadcaster, NPO (Nederlandse Publieke Omroep) has moved with the digitisation by expanding their services on their video on-demand (VOD) service, NPO Start. Not only does NPO strive to reach different audience groups with different opinions by putting forward the public values diversity and pluriformity, but this is also required by the Dutch media law of 2008 (Möller et al., 2018; NPO, 2021). Overall, media play a crucial role within a democracy to allow citizens in different groups and with different interests in society to encounter divergent opinions (Owen & Smith, 2015). As has been mentioned in the news the last few years, NPO aims to do so within the next years through ‘integral programming’, in which the genres are central rather than the channels. Hereafter, it will be decided which channel, namely linear TV or on demand, will broadcast the content. This way, NPO strives to provide more diversity between channels, better-quality content, and create a clearer differentiation between news, actualities, and opinions. This new approach was crucial according to NPO’s director, Frans Klein, due to the emergence of new streaming services and the changing viewing behaviours of their audience (Brandenburg – van de Ven, 2020; Hinke, 2022).

These responses by NPO are significant to look at, as it has been argued that genres are crucial within programming policies, as well as the fact that viewers describe and discuss supply in terms of genres (van der Wurff, 2004). Furthermore, van der Wurff (2004) has stated that television provides different needs of various audience groups by offering divergent genres. Hence, previous research, especially within Europe, have focused on programmes within genres, while also focussing on prime time in particular (Hellman, 2001). Moreover, various research have analysed genre diversity by measuring supply and consumption (van der Wurff, 2004). Within these research, some explicitly focused on broadcasting diversity with regards to television (Hellman, 2001; van der Wurff, 2004), whereas others focused more on the response by PSM towards platformisation with regards to social media rather than on demand services (van Es & Poell, 2020; Donders, 2019). However, with the process of digitalisation and platformisation, it is crucial to continuously monitor the diversity of programming with respect to broadcasters. Therefore, this thesis aims to contribute to the research focusing on genre diversity, by analysing the supply and consumption diversity with regards to NPO.

This will be done by comparing linear TV with VOD in terms of supply and consumption diversity with regards to the genres available in the content, while focusing on NPO. In the following section, a literature overview will be provided discussing the role of public service media, NPO’s role as a public broadcaster, their visions for linear TV and VOD, various concepts of diversity, competition, and NPO’s genre management. This section will end with the research questions. Hereafter, the data provided by NPO will be discussed, including the pre-processing steps, exploration and preparation of the data, and ethical and legal considerations of both using these data and conducting this research. In section three, the methods used to measure diversity and consumption will be discussed. This is followed by an analysis of the results, whereafter a discussion and conclusion are given.

1.2 Literature Overview

1.2.1 The role of public service media

PSM have been defined “as the provision of services by public broadcasters that contribute to the democratic, cultural and social objectives of society, and this on multiple devices and across various technologies” (Donders, 2019, pp. 1011-1012). As Jakubowicz (2010) has stated, PSM act as an umbrella for “a broad network of public and civic institutions and groups” (pp. 9). Generally, PSM have a societal role in which they are obliged to maintain cultural, social, and political cohesion (Nissen, 2013), as well as the obligation of realising public values, such as diversity (van Es & Poell, 2020). The emergence of the Internet, however, has led to a shift from focusing on the mass to the individual (Nissen, 2013). Therefore, Burri (2015) has argued for the reframing of PSM as a producer, navigator, and memory institution. This shift is especially visible with the process of platformisation, namely the transition to online services. Traditionally, public service broadcasting (PSB) aimed to reach all citizens in the country with their content and so contribute to the democratic society. PSM have the same goal, yet with platformisation this becomes more difficult (Donders, 2019). Moreover, platformisation may lead to fragmentation of content, as the focus is not so much on the collection but more on individual content (van Es & Poell, 2020).

Within this digital evolution, PSM are constantly changing, resulting in a complication of distribution compared to the past. Two decades ago, PSM merely connected their content with their audience by the means of television and radio (Donders, 2019). Overall, PSB have the task to modernise their relationship with their audience (Bardoel, 2003). Another change is that the citizen is more central, which means that the contents are adjusted to the demands of society as well as focusing on minority groups. These changes are also visible within the transformation of the Dutch public broadcaster, NPO (Donders, 2019). Over the last 70 years, they have offered content for television, yet moving with the shift to the digitisation of content, they have been active on the Internet for over 20 years (NPO, 2015), including their on demand service, NPO Start. While doing so, they conserve a crucial role in maintaining cohesions and promoting public values (van Es & Poell, 2020). Another change visible with NPO is the focus from collectivist to individualist, where the former system was organized according to social segmentation and the latter focuses more on the citizen (Bardoel & Brants, 2003). Thus, the citizen has become more central and with platformisation, services are offered anywhere at any time (Donders, 2019). This increased with the implementation of audience research (Bardoel & Brants, 2003), and it has been mentioned in management contracts from 2017 onwards that the consumption behaviour of their audience has changed (Donders, 2019).

1.2.2 NPO as a public broadcaster

In the Netherlands, the public broadcasting system is decentralised, with NPO functioning as the umbrella organisation that manages the executive and national public broadcasters (NPO, 2015). They are responsible for the functioning of the different broadcasters and their creators, including the coordination and collaboration, distribution, and (integral) programming. They also strive to create cohesion among them as well as distribute the budget and airtime (NPO, 2021; Donders, 2019; van Es & Poell, 2020). Within the Dutch public broadcasting system, different public broadcasters have different societal and ideological backgrounds, such as being Christian or liberal, and thus reflect different groups, but some have merged over time. These broadcasters share several channels, and as a result, the mergences have impacted the distribution, which are fragmented over the different broadcasters (Donders, 2019; van Es & Poell, 2020). Nonetheless, public broadcasting must be viewed as a whole, rather than

individually, where the content of one broadcaster may lead to interests of another, especially on on demand (van Es & Poell, 2020).

As stated by the Dutch Media Act of 2008, public media must “contribute to the democratic, social, and cultural needs of society and its reception should be freely available for a broad and diverse audience” (van Es & Poell, 2020, pp. 3). Hence, divergent groups of society must be acknowledged, including minorities (Engelbert & Awad, 2014). While maintaining different public values, their content must reflect information, education, and culture (van Es & Poell, 2020). Overall, NPO strives to be relevant in the media environment and to bring people together while being insightful about differences between population groups (NPO, 2015). Between 2022 to 2026, they strive to offer personal and social values, considering their backgrounds and interests (NPO, 2021). The goal is that their audience comprehends what is current in the Netherlands as well as in the rest of the world (NPO, 2015). Also, within the different media, NPO aims to provide reliable information and offer a space for creativity and social debate (NPO, 2021). The audience is central to NPO, as their desires are crucial in the design and content provided within the programmes that are offered. Here, the management of genres is crucial to provide relevant and qualitative content, which is based on diversity, variation, renewal, and pluriformity (NPO, n.d.). By offering diverse content, NPO strives to put the public value pluralism forward, in which the common interest is central. Here, the goal is to offer content to all public, including subcultures, niches, and minorities, while representing their political and social opinions, views, and ideologies (NPO, 2021). Since the late 1990s, diversity became more crucial, while Dutch-language programs ought to unite minorities and ‘mainstream’ audiences. This especially emerged to create a sense of nationality and diminish differences between groups. This also became evident for NPO with regards to their values, audience profiles, and programming from 2008 onwards (Engelbert & Awad, 2014). The latter includes scheduling particular content considered relevant during prime time or daytime (Bardoel & Brants, 2003).

On the other hand, pluriformity tends to denote cultural differences that were present in Dutch society before many migrants from outside Europe arrived in the 1960s. This value relates to the different social pillars (i.e., Catholic, protestant, socialist, and liberal) that were on forefront in society, especially within the 20th century (Engelbert & Awad, 2014). When the depillarisation started, moving from political motives to cultural motives (Bardoel & Brants, 2003), Dutch citizens uncovered the worldviews from other pillars. This means that pluriformity allowed PBS to draw on the concept of ‘post-multiculturalism’, while focusing on diversity enabled to approach ideological differences (Engelbert & Awad, 2014). As a result, from the 1960s, there was more focus on the different cultures and minority groups within broadcasting (Bardoel & Brants, 2003). New technologies, especially television, were crucial during this process (Engelbert & Awad, 2014; Bardoel, 2003), and thus it could be argued that VOD could extend the horizon of their current audiences with regards to exposure of different content and worldviews. Overall, Bardoel (2003) has argued that PSB must “be active on both old and new platforms, such as the Internet” (pp. 84), especially with regards to pluriformity.

1.2.3 Linear TV and on demand for NPO

In order to stay relevant, NPO responds to the new forms of watching content on different channels, namely linear, on-demand, time phased, and timeless. Crucial genres within the time phased channels are news, actualities, sport, amusement, and human interest. By offering live content on linear channels, viewers may feel connected through a shared experience (NPO, 2015). In contrary, ‘timeless content’ (i.e., tv-series, films, and documentaries) are watched more often on on-demand (NPO, 2021). This suggests that particular genres are considered more relevant within a particular setting. Moreover, NPO’s integral programming stems from

the media usage of the audience, which influences the supply, time frame, and channel of content (NPO, 2021). In 2010, NPO expected that the linear channels would remain dominant, and that the youth would perform more media usage on on demand. Therefore, a ‘duo-strategy’ was implemented, in which the older audience would be provided content on the linear channels and a broader supply of content would be made available on on-demand (NPO, 2015). As NPO responds accordingly to viewing behaviour with regards to either linear TV or on demand, it is crucial to compare these two in terms of diversity, especially with the ongoing process of platformisation. Considering these responses, the following hypotheses can be stated:

1. The supply and consumption diversity of genres differ between linear TV and on demand
2. There is a difference in both supply and consumption diversity of genres with regards to the time frame, namely prime time and daytime

Although the audience’s media usage is the main focus of integral programming for the next few years (NPO, 2021), the previous set-up can be seen in Figure 1. Here, the goal was to supply content to different audience groups, at different times of the day, on cross-media (NPO, 2015). This emphasises NPO’s response to different media. Hence, integral programming meant that they sought to take into account that different target audiences want to watch content in different ways. In order to perform this programming, knowledge about the different target audiences is necessary. The changes in media usage, supply and markets influence the changes in the programming strategies and distribution of supply (NPO, 2015). Thus, given that the media landscape is expanding, especially towards online channels and platforms, integral programming is crucial. This means that the on demand platform is programmed to be an alternative to linear watching and listening. In other words, while investing in linear TV, the on-demand channels are also strengthened. While viewers used to be dependent on public broadcasters for content, the global expansion of VOD services lead to the crucial question of which content will allow the public broadcaster to remain relevant and appealing to the Dutch audience. Hence, the focus is to supply content of high quality while maintaining public values (NPO, 2021). Furthermore, on their VOD service, NPO strives for their audience to not end up in a filter bubble by nudging them into watching more diverse content based on their previous viewing behaviour, after the implementation of their recommendation algorithm in 2018 (van Es & Poell, 2020).

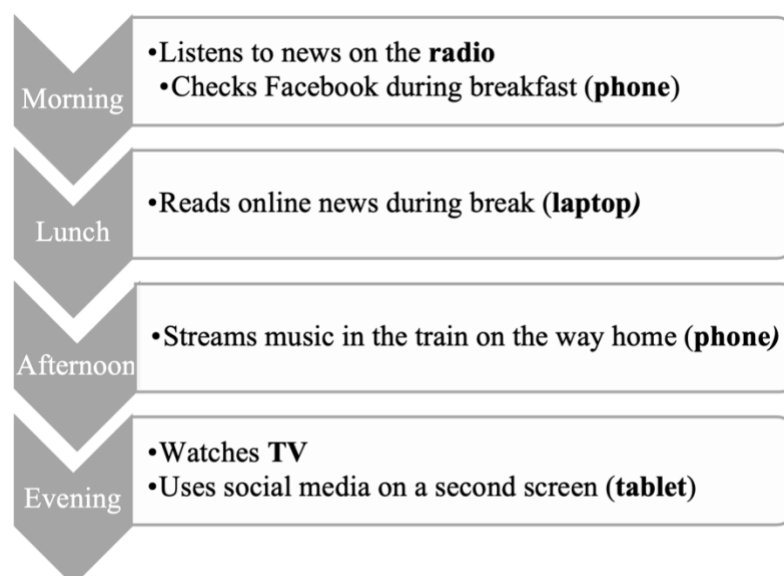


Figure 1: Integral programming (translated from NPO, 2015)

Overall, the linear channels have proven to remain the most popular and stable way to connect to their audience. On demand, there has been an increase in watching content during self-chosen time frames. It has shown that mobile distribution is more effective with regards to news, short video's, interactivity, and supply for the younger audience. By keeping track of these media behaviour, NPO strives to supply their content within more flexibility. NPO's on demand service allows their audience to rewatch content that had been broadcasted earlier on linear TV. For the future, NPO aims to supply content that has not been broadcasted on linear TV yet, as well as supply all episodes in advance. This will allow more flexibility with regards to the audience's demands. At the moment, the content of which NPO has rights is offered for free on on demand. For the content of which this is not the case, it is possible to rewatch up to a minimum of seven days after these have been broadcasted on linear TV. For the future, NPO's production will be available on both channels simultaneously, including more episodes or the whole season. These changes are a way to adjust to mobile on-demand behaviour and reach younger audiences (NPO, 2021).

1.2.4 Diversity

As mentioned earlier, diversity is a crucial public value within NPO's policy. This is also the case within the media law and policy, as it is significant for citizens within a society with different interests to obtain and interact with different opinions (Möller et al., 2018). Various scholars have provided different definitions of diversity. Van Cuilenberg (1999) has defined diversity as the "heterogeneity of media content in terms of one or more specified characteristics" (pp. 188). Van der Wurff (2004) defined it as "the heterogeneity of media content on one or more relevant dimensions" (pp. 216). Such dimensions can be understood as the genres provided by NPO as well as consumed by viewers. McQuail (1992), on the other hand, explained that the definition of this value origins in the Western conception of a modern society, namely "one in which a premium is placed on individualism, change, freedom of thought and movement" (pp. 141). Nowadays, societies are diversified and segmented and diversity is a response to this (McQuail, 1992). Moreover, over time, the notion of diversity has exceeded from merely referencing political and social divergences to the market of including various choices and services (Hellman, 2001). Within this research, diversity will be defined as *the heterogeneity of media content on several dimensions, with a focus on the individual citizen*, while referring to a range of choices.

In Europe, broadcasters aim to provide diversity of content that is accessible to all segments in terms of politics, culture, and minorities (McQuail, 1992). McQuail (1992) has argued that mass media can provide diversity by acknowledging dissimilarities in society, providing divergent ideologies, and providing a wide range of choice. As diversity ought to reach different groups in society and satisfy as many viewers as possible by providing a wide range in content, it is crucial in providing quality and pluralism. Overall, diversity is present when the viewers are met (Hellman, 2001). Furthermore, it has been crucial in the debate to tackle ending up in an 'echo chamber', where merely similar content is encountered, or a 'filter bubble', where the self-confirming exposure to similar content leads to polarisation and fragmentation (Möller et al., 2018). Increasing the choice possibilities results in positive utility for the audience of television (Hellman, 2001). As Hellman (2001) has stated, "diversity of television broadcasting is typically connected with consumer choice of quantity and range" (pp. 182). The more options in content or channels are available, and the more divergent these are, the more diversity is offered to the audience (Hellman, 2001; McQuail, 1992). However, it has been argued to be threatened by market pressures (Hellman, 2001).

1.2.4.1 Open diversity-as-sent, open diversity-as-received and reflective diversity

Van der Wurff (2004) divided the notion of diversity into different concepts, including *diversity-as-sent* and *diversity-as-received*. The former refers to the heterogeneity of genres, and impacts the content viewed by the audience, including particular opinions or worldviews. This was inspired by the notion of “diversity of content ‘as sent’” coined by McQuail (1992, pp. 157), where the focus is on the (individual) channels and the different content they provide and could be further categorised by genres. The latter refers to the heterogeneity of genres that are viewed by the audience. This is a crucial aspect, as the selections made by the audience are a result of decision-making, due to for example scheduling, and may indicate whether these decisions are successful. This concept was inspired by the notion of “diversity of content ‘as received’” (McQuail, 1992), which is “weighted according to the size of audience reached” (pp. 157). Both concepts are placed within *open diversity* (van der Wurff, 2004), which provides an estimate of how evenly broadcasting time is distributed among genres and occurs if the content is very heterogeneous. Together with *open diversity*, *reflective diversity* evaluates whether the supply is ‘sufficiently’ diverse. *Reflective diversity* resembles the idea that supply must match demand (van der Wurff, 2004; van der Wurff & van Cuilenburg, 2001).

Furthermore, *open diversity* can be put in relation with whether viewers perform active or passive behaviour. Various research has focused on whether audiences choose the content rationally, who are referred to as active viewers. These have shown that this is the case for some viewers in the United States, as a result of many channels being offered, which in turn increase the options to choose from. On the other hand, broadcasters create schedules for their content, which lead to their audience to keep watching their channels. This may lead to many people watching different content on one channel rather than watching content on different channels. These viewers are also referred to as passive viewers, who together with active viewers are crucial for the relations between *diversity-as-sent* and *diversity-as-received*. If there are more passive viewers, the *diversity-as-received* will depend on the *diversity-as-sent*. When there are more active viewers, *diversity-as-received* will depend more on the options and preferences (van der Wurff, 2004). Previous research has also shown that such behaviour is in relation with the time of airing (Napoli, 1997; Souchon, 1992).

1.2.4.2 Channel diversity, intra-channel diversity and inter-channel diversity

Furthermore, diversity of programming can be reflected on by relating genres to channel diversity (Hellman, 2001). It is crucial to offer diversity in terms of providing various channels, as PSB should aid media markets in not suffering from market failure. This in turn provides divergent content and acknowledges different audiences (Sjøvaag et al., 2019). Inspired by Litman (1979), Hellman (2001) refers to ‘channel diversity’ as “the ‘vertical’ choice of programmes provided by any single channel over a period of time” (pp. 184). This reflects the diversity of each channel with regards to the genres offered to the audience (Hellman, 2001). Moreover, by looking at the diversity of an individual channel, one is looking at the channel’s content diversity (McQuail, 1992). As stated by McQuail (1992), “the more channels and the more differentiated they are, the more diversity” (pp. 156). Diversity can be reached either internally, by offering a wide range of content through different channels with the aim of reaching a heterogeneous audience, or externally, by including multiple channels that are organised in a way to minimise duplication (McQuail, 1992).

Additionally, a distinction is made within channel diversity. *Intra-channel diversity* refers to the heterogeneity of genres that are provided by a channel. *Inter-channel diversity*, on the other hand, refers to the differences in genres between channels. The former is crucial to look at when the audience prefers a particular channel over certain genres. The latter is

significant for the audience, as this implies that they have the option to choose between genres (van der Wurff, 2004; Hellman, 2001). *Inter-channel diversity* can only increase if *intra-channel diversity* decreases, and vice versa (van der Wurff, 2004).

1.2.5 Competition

As stated by McQuail (2000), demand, supply and competition provide an indication of the consumers' taste. Moreover, it is crucial to reflect on how competition affects diversity of supply, because it influences the content the audience watches. A decline in diversity of supply leads to a decrease in possibilities of uncovering different ideas, which in turn endangers social, economic, and cultural progress. An increase in diversity of supply, however, could lead to viewers merely watching content they already like (van der Wurff, 2004), resulting in a filter bubble or echo chamber. Moreover, the more severe competition, the more immoderate and less openly diverse the same supply (van der Wurff & van Cuilenburg, 2001).

With the increase in number of channels from the 1990s, competition has increased, which contributed to *open* and *reflective diversity*. An increase in competition, however, also leads to a decrease in the average number of views per channel (van der Wurff & van Cuilenburg, 2001; van der Wurff, 2004). Furthermore, claims have been made that this increase in competition jeopardises the diversity of content. Opponents argue that competition requires broadcasters to reply more effectively to demand and increase the range of choice. PSB can prevent disastrous competition, as they are required to offer minimum quantities of cultural and informative programmes (van der Wurff, 2004).

Nevertheless, in the 1990s, the average broadcasting time and thus the average television supply in terms of the hours of programming per channel per day increased tremendously. This did, however, not hold for the demand, leading to an increase in competition (van der Wurff, 2004). Already stated in 1996 by Sondergaard, competition necessitates PSM to respond more to their audience, especially as they have much impact on the cultural and social elements in society. Although PSM have changed over the last few decades and are still evolving, this still holds as the citizen has become more central in the policy, especially for NPO. Furthermore, by requiring media companies to meet demand as effectively and efficiently as feasible, competition maximizes social welfare (van der Wurff & van Cuilenburg, 2001).

1.2.6 Genre management

As stated earlier, the management of genres is crucial for NPO to offer diverse and pluriform content, as the goal is to reach different audience groups. Within broadcasting, these are applied to different channels. The wider the range of genres available, and when evenly distributed, the greater the diversity of supply. Furthermore, by offering more choices, the likelihood of offering the preference increases as well as a sense of control (Hellman, 2001). Besides, as Miller (1984) has argued, genres could be understood in a way that describes what is considered to be important, whether it is regarding language or activities. The labelling of genres has also been argued to influence their meaning and cultural value (Johnson, 2020).

For NPO, the supply of different genres and subgenres ought to be diverse with respect to the audience's demands (NPO, 2021). This is because over the last few years, the audience has been considered to be more crucial than the medium or channel. Therefore, NPO has adjusted their visions accordingly to changing media behaviour, globalisation, and digitisation (NPO, 2015). Moreover, it is considered crucial to keep their audience up to date with events, facts, and opinions by stimulating debates, as well as offering support to the creative sector and providing knowledge and information in order to participate in new activities. Overall, as NPO

aims to bring citizens of the Netherlands together, social cohesion is crucial, while representing different perceptions and backgrounds. Hence, their social significance does not focus on profit, but rather on being independent and trustworthy (NPO, 2021).

Research (GfK, 2019) has shown that half of the audience value choosing the genre, while 1/3 chooses a particular show. With the emergence of NPO's on demand service, their audience can select content rather than following a given schedule. Here, relevant content is crucial, which lead to the expansion of NPO's genre management. Each genre has a specific approach, including a particular vision, goals, and criteria, with the aim of providing better shows. From 2022 to 2026, NPO aims to focus more on the supply of channels in order to meet their audience's demands (NPO, 2021). These plans are crucial, as the first quarter of 2022 will be included within the analysis, which will be discussed in the data section, and these reflect the public values NPO strives to maintain. Also, perhaps certain changes over time with regards to the diversity of genres in supply and consumption could be explained.

The audience's demands can be obtained from the increasing usage of on demand services, which in turn allows for new insights that could lead to adjustments in both supply and programming. Within this process, a genre policy is set up, which ought to provide a clear focus on the preconditions while aiming to supply qualitative significant content and to stay valuable and relevant. This is crucial within the media environment that is becoming more complex, and to keep the public broadcasting appealing for a diverse audience. Hence, in the future, the content will be more significant, while the genre policy is maintained, which focuses on quality, diversity, variation, and pluralism. Moreover, each broadcaster may focus on specific themes, while promoting their own specific mission as long as their pitches for new shows are situated within the genre policy's framework. Overall, the autonomy of the broadcasters and the pluralism that are noted in the 'media law' must be sustained (NPO, 2021). Knowing the plans for the future, it could be reflected on to what extent the diversity of genres has been maintained in content supply up to 2022.

Within the genre policy, ten main or dominant genres are adjusted accordingly to four different 'supply profiles', based on the diverse public and offered in different contexts. These genres are news and actualities, opinion, worldview, human interest, art and expression, music, drama, knowledge and education, sport, and amusement. For the different genres, a cycle has been created which reflects NPO as well as the broadcasters and sector's responsibilities and tasks (see Figure 2). This is crucial in order to respond optimally to changing media behaviour and demands. In the past, this merely focused on linear channels, whereas this now also includes on-demand. This allows the audience to choose their supply on their own time besides the linear schedule. Furthermore, various goals, criteria and processes are determined with regards to the quality, renewal of shows, and the development of language. Here, quality is considered to be most significant (NPO, 2021).

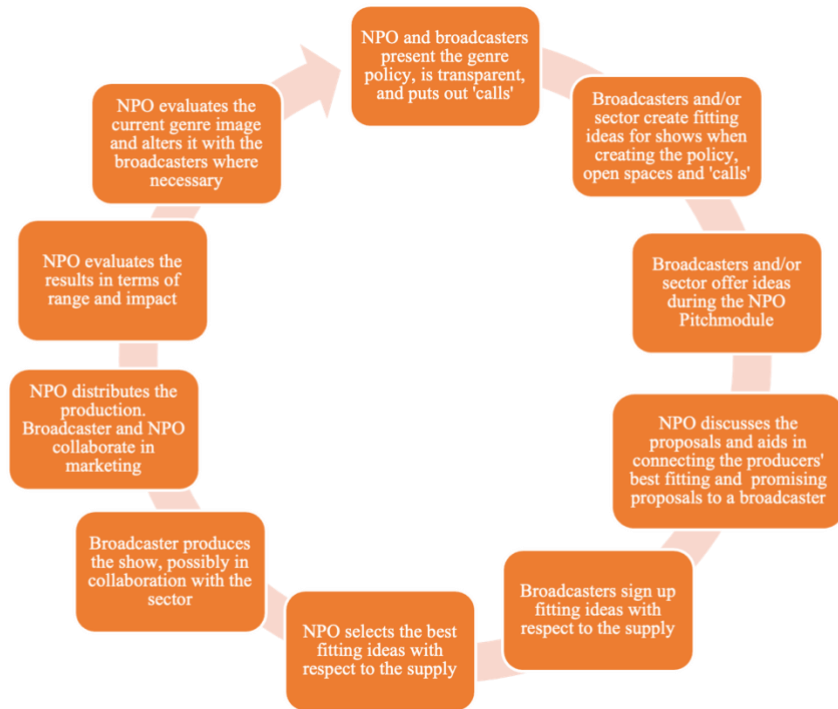


Figure 2: Genre cycle (translated from NPO, 2021)

1.3 Research Question

The heterogeneity of genres has widely been used to measure diversity. This research will do so as well by reflecting on the ‘diversity of genre’ (Hellman, 2001) while analysing the supply and consumption diversity of content by NPO. To do so, the method performed in van der Wurff’s research (2004) will be adopted by implementing the concepts of *open diversity-as-sent*, *open diversity-as-received*, and *reflective diversity*. However, rather than merely focusing on the supply and consumption diversity of television programmes, as van der Wurff (2004) had done, these will be compared to the supply and consumption diversity of on demand. By doing so, the following research question will be attempted to be answered to accept or reject the hypotheses stated in section 1.2.3: Is there a difference in consumption diversity of genres between on demand and linear TV with regards to the content provided by NPO and has this changed over time? Similarly to van der Wurff (2004), a distinction is made between prime time and daytime. Furthermore, this research aims to complement this analysis by including the diversity of channels. This will be done by implementing the concepts of *intra-channel diversity* and *inter-channel diversity*. By doing so, the following sub question will be attempted to be answered: To what extent are the supply and consumption of and between the channels diverse with regards to the genres?

2 Data

In order to be able to compare linear TV and on demand, different datasets provided by NPO were extracted, merged and pre-processed. These include data on linear TV and VOD streaming, as well as their metadata, internally labelled genres (i.e., CCC, which will be discussed later) and the dates. Here, it was crucial to be consistent with the data by merely including episodes that are present in both the linear TV and VOD streaming datasets, as well as reducing all these datasets to the dates that are present in both datasets, namely 16 July 2018 to 22 May 2022. Furthermore, as this research focuses on the viewing behaviour of the audience, the viewing density for VOD were calculated similarly to the way that the viewing

density is measured for linear TV by NPO. This is because the latter was provided in the data, whereas the former was not, and it is crucial that the data on linear TV and VOD are compatible to perform the analysis.

These data provided are stored in the Google Cloud Platform BigQuery, which is a serverless data warehouse, and could be extracted by using SQL queries. By connecting to the platform's project ID, which must be kept secure due to legal considerations, and applying SQL queries, it was possible to connect with the service and data through Python. Due to the fact that some datasets were extremely large it was considered more efficient to extract the necessary data within BigQuery before connecting with Python for computational reasons. Thus, while SQL was used most prominently when exploring and altering the datasets, Python and Pandas were applied to alter a selection of the data for pre-processing and analyses purposes.

2.1 Data pre-processing

As there was a large amount of data provided by NPO, it was crucial to explore the data, while being explicit in what data would be required for linear TV and on demand to be compatible to be able to answer the research question. This included data with regards to the viewing behaviour, such as the viewing density and streaming time, as well as the different types of labelling genres within the content. For the sub question, it was considered crucial to include data on the channels. Moreover, for exploratory purposes, the broadcasters were also considered relevant to obtain. Other data that were considered crucial will be discussed below. In order to gather these data, it was necessary to merge different datasets. First, when exploring the different datasets, it became clear that the data on linear TV are situated from 16 July 2018 to present, whereas the data on VOD are gathered from 7 October 2016 to present. Thus, before it was possible to merge the required datasets, namely on linear TV, VOD streaming, the metadata, the internally labelled genres (i.e., CCC) and the dates, each dataset had to be filtered on the dates from 16 July 2018 to 22 May 2022 to be consistent.

Various selections had to be made to gather and clean the data deemed necessary to compare linear TV and on demand. Firstly, as this research specifically focuses on on demand, merely data on NPO Start/Plus and on demand streaming behaviour were included within the VOD streaming dataset, excluding data on watching live broadcasts. This was done by filtering all streaming data on the value 'npportal' in the 'brand' column and on the 'on demand' value in the 'type_of_stream' column. Both free and paid users that are logged in are included, as this distinction could result in different viewing behaviours between online viewers. These options may also impact the differences visible between viewing behaviour through either linear TV or on demand.

Furthermore, as this research focuses on the viewing behaviour of the audience, certain data were filtered in both the linear TV and VOD streaming datasets. In the linear TV dataset, merely the first broadcast was included, with the 'audience' column being filtered on the value '6+' and the column 'universe' was set to 'Nat[SKO]', as these are the values on which the viewing density is calculated by NPO. As the viewing density for VOD was not present in the VOD streaming dataset, a new column was created in which the viewing density was calculated. This was done by taking the sum of number of streams (i.e., popularity) multiplied by the fraction of watched, which equals the average of VOD viewers per episode. Here, merely the first streaming days up to 28 days after the first broadcast date were included. This is because the viewing density for linear TV is calculated up to 28 days after the first broadcast of the last episode of the season, and thus the same would have to hold for the on demand data in order for these to be compatible. Similarly, with the aim of making a distinction between the

consumption diversity of free and paid users on VOD, the total viewing density and the streaming time were calculated for each individually.

Hereafter, to explore and compare the viewing behaviour of the audience of both linear TV and on demand, eight extra columns were created conditional on the time of day. Again, calculations were merely performed up to 28 days after the first broadcast of the last episode of the season. First, six columns were created for VOD, summing the viewing density per episode: three focus on prime time and three on daytime, in which distinctions are made based on the overall viewing per episode and for free and premium users individually. After all these steps were performed, all datasets could be merged on the episode ID, ccc-name and date, leading to a new dataset containing 79.399 rows. Lastly, two Boolean columns were created for prime time (i.e., 6pm to 12am) and daytime for linear TV, using Pandas. The selected columns and the percentage of missing values are presented in Table 1.

Table 1: Percentages missing values in the data per column

Column	Percentage missing values
episode_id	0.0%
title	0.0%
date	0.0%
kdh	0.0%
beginTimeCET	0.0%
endTimeCET	0.0%
repeatType	0.0%
audience	0.0%
universe	0.0%
VOD_seconds_watched	0.0%
VOD_KDH	0.04%
brand	0.0%
type_of_stream	0.0%
episode_main_genre	0.71%
episode_sub_genre	0.71%
series_main_genre	1.02%
series_sub_genre	1.02%
allocated_channel	0.0%
allocated_broadcasters	0.0%
episode_duration_minutes	0.0%
VOD_free_KDH_within_28days_episode_release	0.001%
VOD_free_seconds_streamed_within_28days_episode_release	0.0%
VOD_KDH_within_28days_episode_release	0.004%
VOD_premium_KDH_within_28days_episode_release	0.0%
VOD_premium_seconds_streamed_within_28days_episode_release	0.0%
VOD_seconds_streamed_within_28days_episode_release	0.0%
npo_genre_team	0.04%
ccc_naam	0.04%
year_number	0.0%
month_number	0.0%
VOD_KDH_primetime	0.0%
VOD_free_KDH_primetime	0.0%
VOD_premium_KDH_primetime	0.0%
VOD_KDH_daytime	0.0%

VOD_KDH_free_daytime	0.0%
VOD_KDH_premium_daytime	0.0%
TV_primetime	0.0%
TV_daytime	0.0%

2.2 Data exploration

2.2.1 Genres

As has been stated earlier, NPO has a policy on how genres are processed. Within the data, there are different ways in which the genres are stored. One of these is organised in a way to hold the genres accountable regarding the public values as well as the organisation and for new programme proposals. These are divided in the domain and their CCC (Cross medial Content Classification). Definitions of the latter are presented in Appendix 7.1.1 (translated from NPO, 2017). The ccc-names could be related to their domain genre by extracting unique combinations of these columns in the ccc-dataset (i.e., Table 2).

Table 2: Genres labelled internally

Domain	CCC-names
Journalism	News; actualities; contemporary opinion-forming; opinion-forming
Sport	Contemporary sport information; other sport information; sport reportage
Culture	Art information; artistic game and quiz; cabaret; satire; popular music; classical music; other music
Amusement	Other game and quiz; human entertainment; other amusement
Knowledge and education	Human culture; education; service; factual; educative quiz
Worldview	Religion
Human interest	Human interest; human actua
Fiction	Dutch educative fiction; Dutch other fiction; Foreign educative fiction; Foreign other fiction

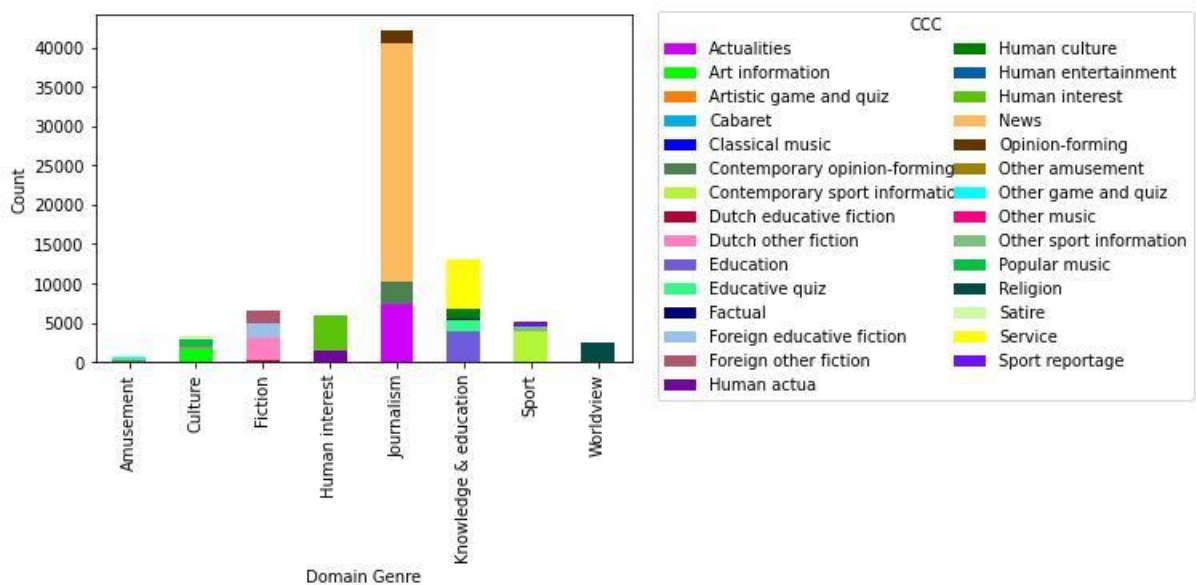


Figure 3: Internally labelled genres' distribution

The distribution of the labelling of these genres within the data is visualised in Figure 3. The distribution appears to be skewed, as the domain genre ‘Journalism’ is overrepresented in comparison to the other labels, with the ccc-name ‘News’ occurring most frequently. The second most labelled domain genre, though having a much lower frequency, is ‘Knowledge and education’, with the ccc-name ‘Service’ occurring most frequently. The genres that are used least for internal labelling are ‘Amusement’, followed by ‘Worldview’. This is an interesting observation, as the genre labels would present the values considered most important within the content provided by NPO. Although ‘News’ is frequently present, one would expect ‘Worldview’ to be crucial to represent different ideologies. Important to note, however, is that this is merely the distribution of the labelling of genres, which has not yet been put into relation with the consumption by the audience.

In order to be able to account for the skewed distribution visible within the internally labelled genres, the distribution of the broadcasters is visualised in Figure 4. Here, we can see that, generally, each broadcaster focuses on a particular domain genre. Considering the overrepresentation of ‘Journalism’, we see that the following broadcasters mainly contain this label: NOS, Ongehoord Nederland, WNL, POWNED, NPO, PP, VPRO, and NTR. What stands out here is that the frequency of this label differs per broadcast, with NOS exceeding all with a frequency of 30.000. This overrepresentation of one genre in the data would be problematic within the analysis as it would cause bias in the supply, which would evidentially lead to a decline in the heterogeneity of supply. With regards to the channels that are present in the data, these are as following: NPO 1, NPO 2, NPO 3, NPO Zapp, NPO Zappelin, and Omroep portal.

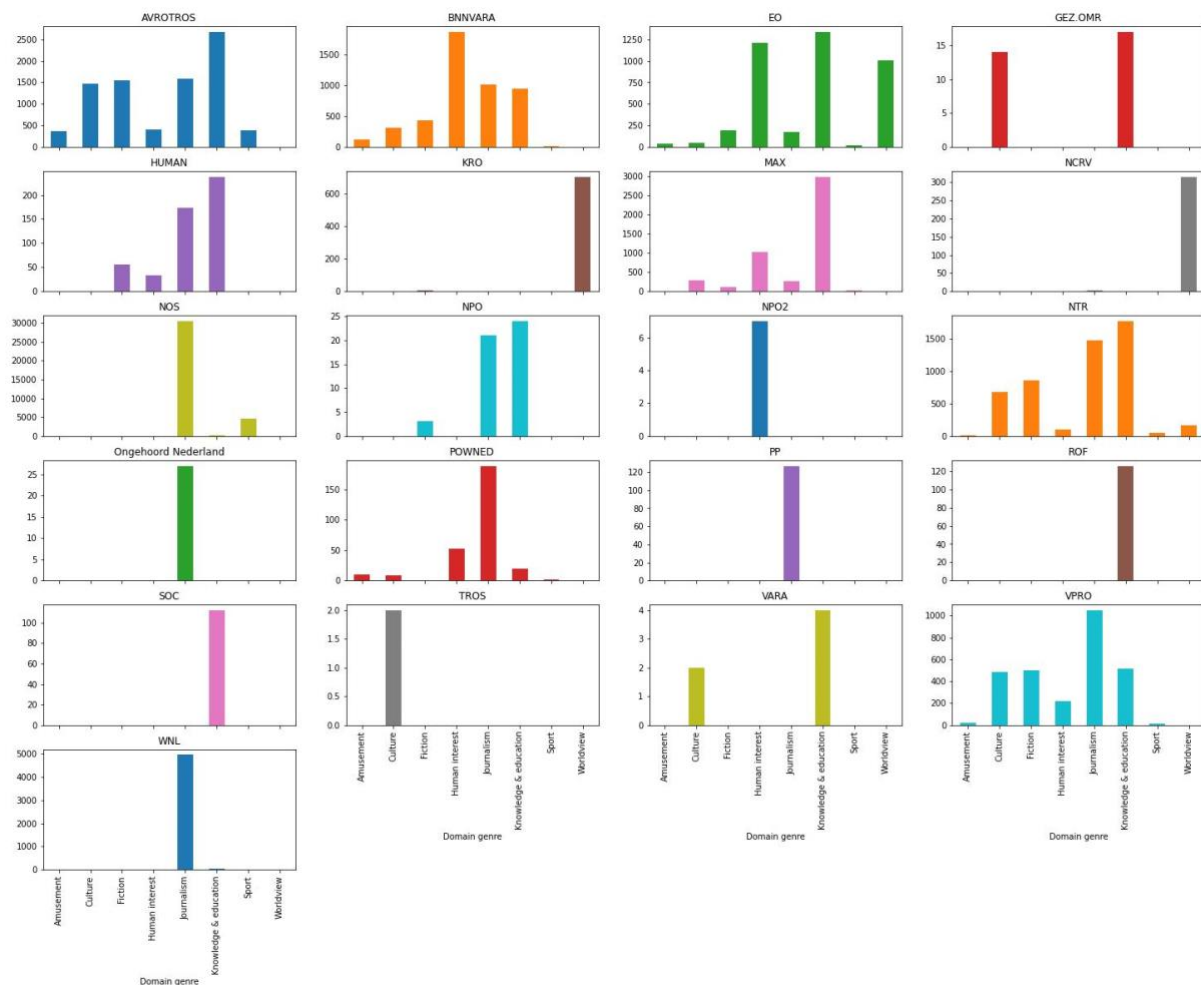


Figure 4: Distribution of the broadcasters and their labelled domain genres

The other form of labelling genres focuses on providing information on the content and type of programme, as well as the findability of the series or episodes. These labels are defined as the main genre and their subgenres. These labels do not necessarily conform to the genres presented online to the audience but is another form of labelling content with regards to their genres. Again, the subgenres could be related to their main genre by extracting unique combinations of these columns from the metadata. By merging the datasets on linear TV and on demand with their metadata, these labels could be gathered per episode (i.e., Table 3).

Table 3: Genres in the metadata used for findability of content features

Main genre	Subgenre
Amusement	Cabaret; other; audio play; event/registration; reality TV; comical; music; game/quiz
Documentary	Religious; cooking/food; human interest; politics; music; travel; health/upbringing; art/culture; nature; science; other; history; sport
Film	Comical; other; tension; drama; crime; animation; theatre; erotic; biography; action; historical film
Human interest	Biography; family; reality TV; career; travel; other; living/garden; love; worldview; health/upbringing; lifestyle; (sub)cultures; religious
Informative	Politics; reportage; event/registration; debate; college; research journalism; social debate; science; interview programme; health/upbringing; art/culture; news/actuality; nature; travel; religious; consumer information; game/quiz; living/garden; cooking/food; other; history
Youth	Serie; informative; sport; amusement; event/registration; other; music; animation; nature; documentary; game/quiz; film
Music	Rock; event; classical; alternative; jazz; other; soul; Dutch; pop; concert registration; world music
Serie	Crime, detective; romance; historical; tension; other; soap serie; drama; animation; comical
Sport	Sport game; other; event; analysis; sport information

The distribution of the labelling of main and subgenres per episode is visualised in Figure 5. Here, I decided to look at the episodes rather than series, as the data are gathered by the unique episode IDs as well as the fact that there are fewer missing values per episode than for the labelling of the series' genres. The distribution of the labelling of main and subgenres per series can be found in Appendix 7.1.2, which appears to be similar. Here, it can be seen that the main genre 'Informative' is applied most frequently with regards to the other main genres. Here, the most frequently used subgenre is 'News/actuality'. The second and third most applied genre, although with a large difference in frequency, are 'Youth', with subgenre 'Informative' occurring most frequently, and 'Sport' with the subgenre 'Sport information' used most frequently. The other genres are labelled much less, with the main genre 'Film' being applied least frequently, followed by 'Human interest'. For the visualisation of the distributions of both types of labelling, merely the missing values have been excluded.

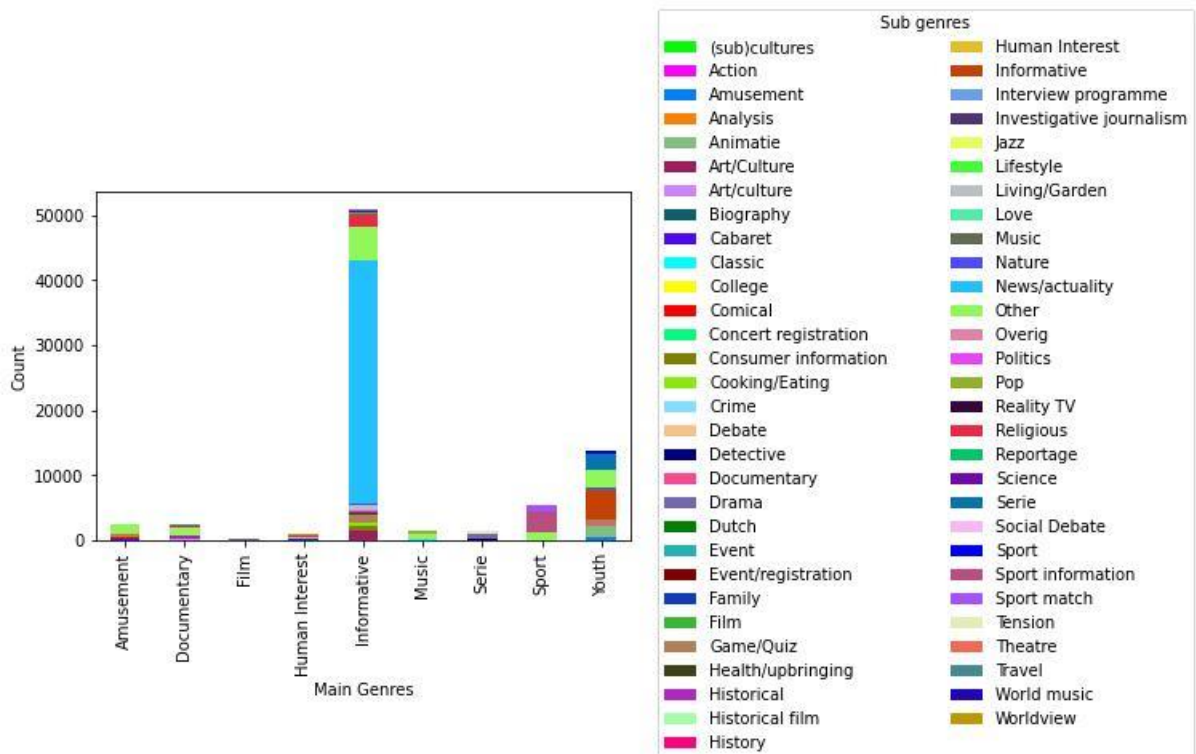


Figure 5: Distribution of main and subgenres in the metadata, per episode

2.2.2 Viewing behaviour

Lastly, as this research does not only focus on the genres, but also on the viewing behaviour, the average viewing time was also explored. This is crucial to look at, because by comparing the viewing behaviour in relation to linear TV and VOD insight is provided on a potential migration from the former to the latter (van Es & Poell, 2020). The minimum length of an episode is 20 minutes, whereas, generally, the longest episodes are almost 45 minutes (i.e., Figure 6). Averagely, an episode is approximately between 25 and 35 minutes, with a median of almost 30 minutes. The outliers mainly lie between approximately 45 minutes and just below 50 minutes, with few outliers being longer. This is important to look at, because, as Figures 7, 8 and 9 show, there is a difference in viewing time between linear TV and on demand. These distributions are the total hours viewers watch content in a day, aggregated over all viewers, which reflects on the number of people watching the episodes. Namely, if an average episode is approximately 30 minutes and the average viewing time is around 350.000 hours for linear TV, this would imply that 700.000 people watched the episode.

As can be seen in Figure 7, the least number of averaging hours in viewing time during prime time for linear TV is approximately 200.000 hours, with some outliers, and the most is approximately 600.000 hours, with most outliers being up to approximately 750.000 hours. Averagely, the total viewing time is between 300.000 and 400.000 hours, with a median of 350.000 hours. For daytime, however, the total average viewing hours on a day is between 40.000 and 70.000 hours, with a median of 50.000 hours. The minimum is almost 0 hours, and the maximum around 110.000 hours, with many outliers up to 150.000 hours. This indicates that more people watch linear TV during prime time hours than during the day.

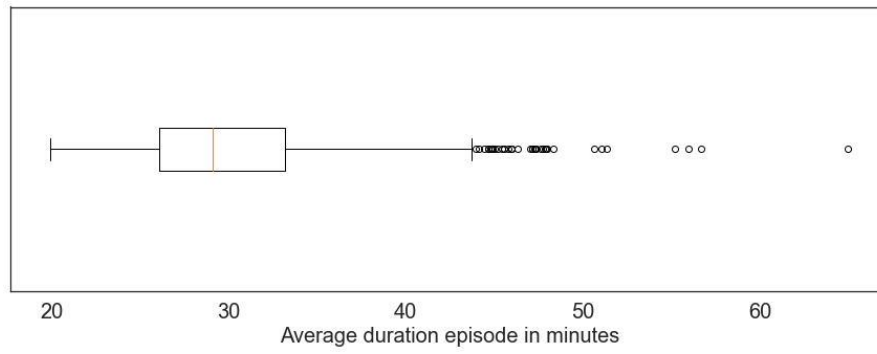


Figure 6: Distribution of the average duration of one episode, in minutes

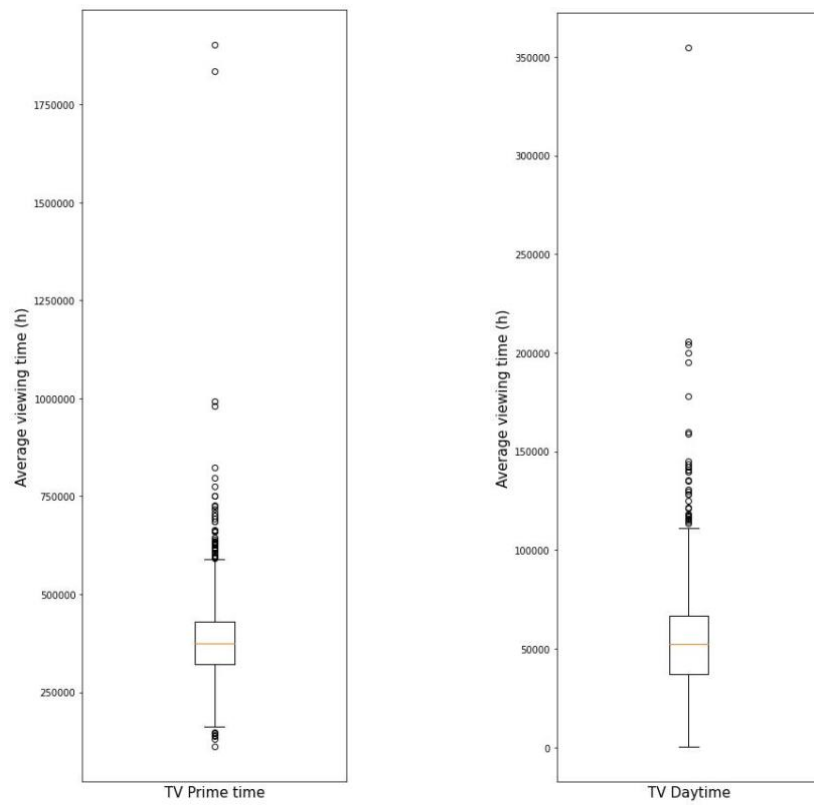


Figure 7: Distribution of the average viewing time in total hours on a day for linear TV prime time (left) and daytime (right)

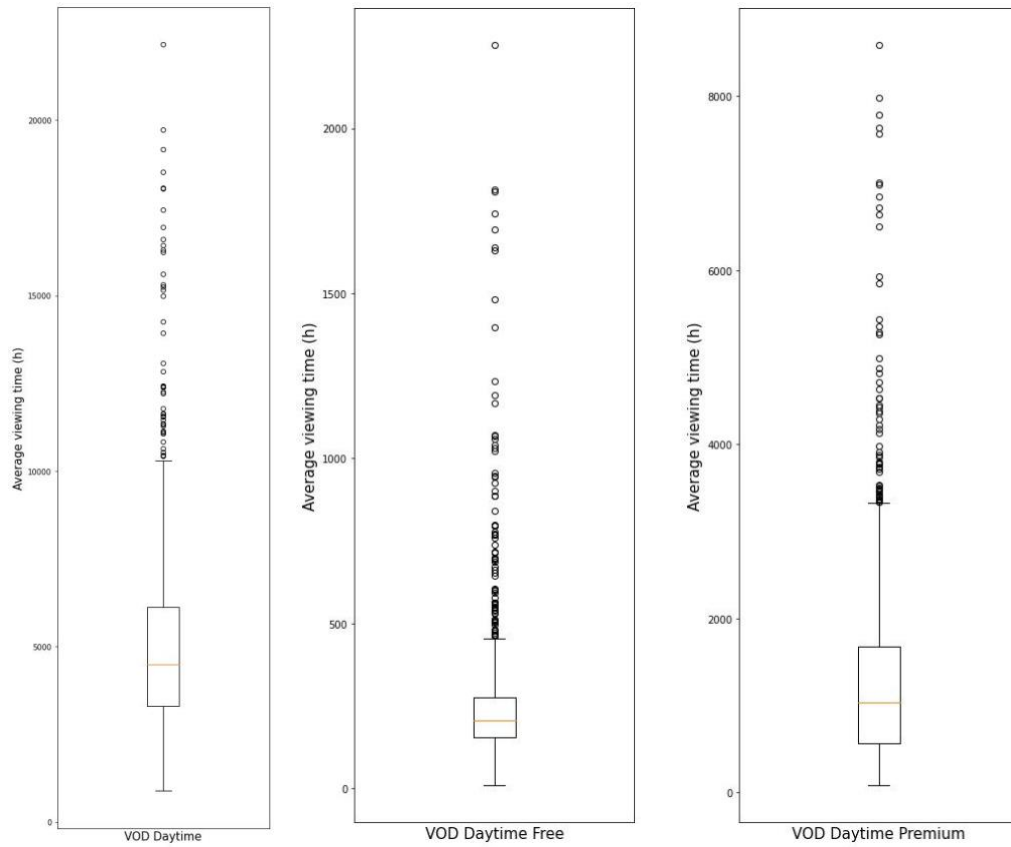


Figure 8: Distribution average total viewing time (hours) on a day for VOD daytime (left), free (middle) and premium (right)

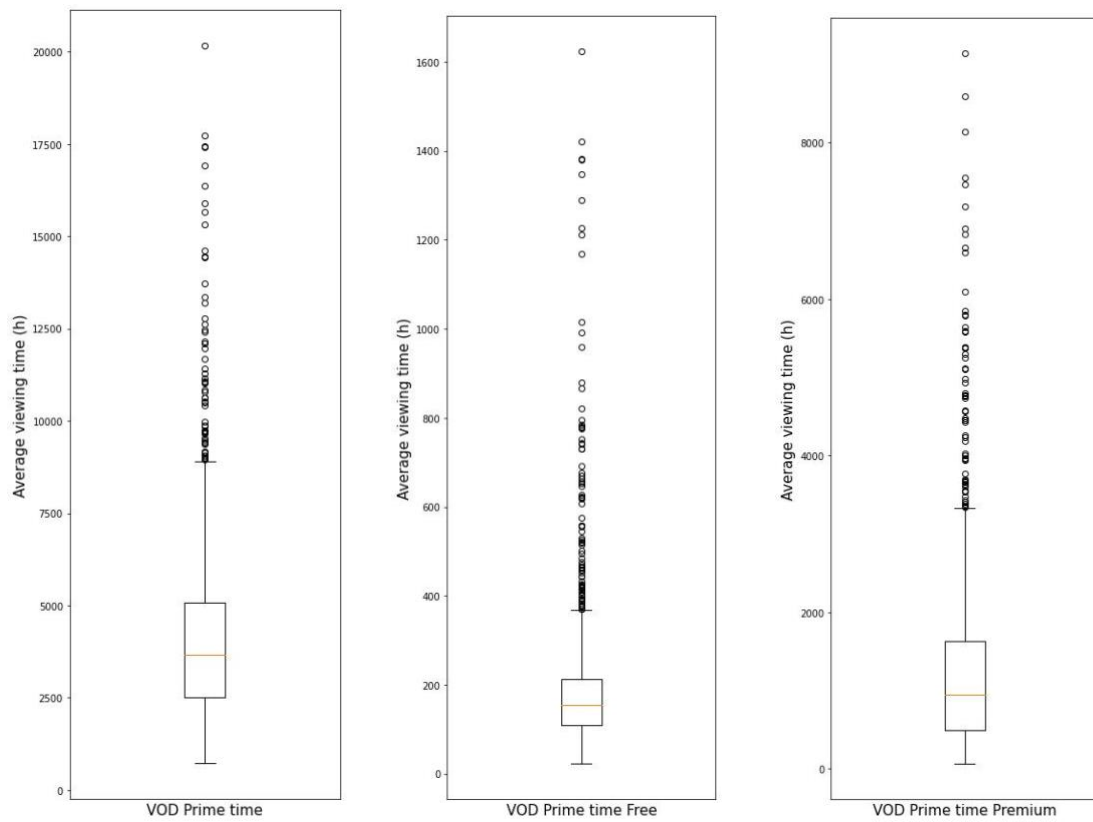


Figure 9: Distribution average total viewing time (hours) on a day for VOD prime time (left), free (middle) and premium (right)

For on demand, the distinction is also made between prime time and daytime, but also between free and premium users (i.e., Figure 8 and 9). In contrast to linear TV, the average of the total viewing time does not appear to differ so much between prime time and daytime, namely from 2.500 to 5.000 during prime time and between 3.000 to 6.000 during daytime. This possibly reflects that the audience on VOD watch content during self-chosen hours, as there are less views during prime time. Moreover, the maximum hours during prime time, around 9.000 hours, is less than during daytime, namely 10.000 hours. During prime time, however, there appears to be more outliers exceeding this number. For both daytime and prime time, premium users watch more episodes than free users, namely almost ten times as much during prime time, and four times as much during daytime. This could reflect the fact that merely content of which NPO has rights is offered for free, while for the remaining content, viewers may rewatch the content over a longer period of time (NPO, 2021).

Overall, there is a difference visible in viewing time between linear TV and VOD, namely the viewing time is much higher for linear TV than for VOD. This indicates that more people watch content on linear TV than on on demand. This could be related to the type of audience, possibly a result of the ‘duo-strategy’ implemented by NPO, but also to competition with other VOD-services, such as Netflix and HBO. These differences in viewing time could also be related to the consumption diversity of genres on linear TV and on demand, as the less hours watched, the smaller the range of possible genres to be watched. Thus, if more people watch linear TV, there could be a broader variety of genres being watched than if less people watch episodes on VOD. If there is not a big difference visible between the consumption diversity on linear TV and VOD, this could indicate that viewers either watch what they receive or watch particular genres that they prefer. Hence, the distinction between *open diversity-as-sent* and *open diversity-as-received* could be explained in relation to the viewing time on both linear TV and VOD.

2.3 Data preparation

Although the data had already been filtered on particular features that were deemed crucial to compare linear TV and on demand, as discussed in the data pre-processing section, it was still necessary to prepare and clean the data to perform the analysis. Firstly, as this research mainly focuses on diversity with regards to genres, I decided to merely focus on one type of labelling, namely the internally labelling. This is because this is the labelling that NPO uses to construct their policy, and thus the analysis would be more in align with NPO’s policy. Therefore, all columns with regards to the main and sub genres for both episode and series were excluded.

Hereafter, the missing values had to be approached. As these genres are a crucial feature within this research, it was decided to exclude all rows which contain missing values within the domain and ccc-name columns. Furthermore, despite that the percentage of missing values within the ‘VOD_KDH’ column (i.e., viewing density for on demand) was relatively low, these rows had to be excluded from the data. This is because the viewing density for both linear TV and on demand are crucial within this research, hence including missing values could lead to a misrepresentation of consumption. Furthermore, these missing values could indicate that the number of streams and/or fraction of watched are missing for these episodes on VOD. By excluding these rows, the missing values within the other columns in which calculations are made based on the viewing density with regards to VOD would be removed as well.

Lastly, as could be seen in Figure 4, the broadcaster ‘NOS’ was overrepresented within the data. Therefore, I decided to exclude ‘NOS’ from the data, as this could cause an over representation of information in the data. By merely excluding this broadcaster, the other news related broadcasters remain in the data, representing this genre. Rather than altering the dataset

created within the pre-processing steps, these alterations were implemented while creating a new dataset. After following all these steps mentioned above, 44.168 rows remained.

The distribution of the genres within the data remains skewed (i.e., Figure 10), however, the difference in frequency between the domain genre ‘Journalism’ and the other domain genres is less large. In contrary, after removing the broadcaster ‘NOS’ from the data, the domain genre ‘Knowledge and education’ has exceeded ‘Journalism’ in frequency. This would be more in align with what would be expected to reach different audience groups and bring them together. Furthermore, within ‘Journalism’, the ccc-name ‘Actualities’ now occurs most frequently. The domain genre ‘Amusement’ remains one the least used label, yet ‘Sport’ occurs less frequently within this cleaned dataset.

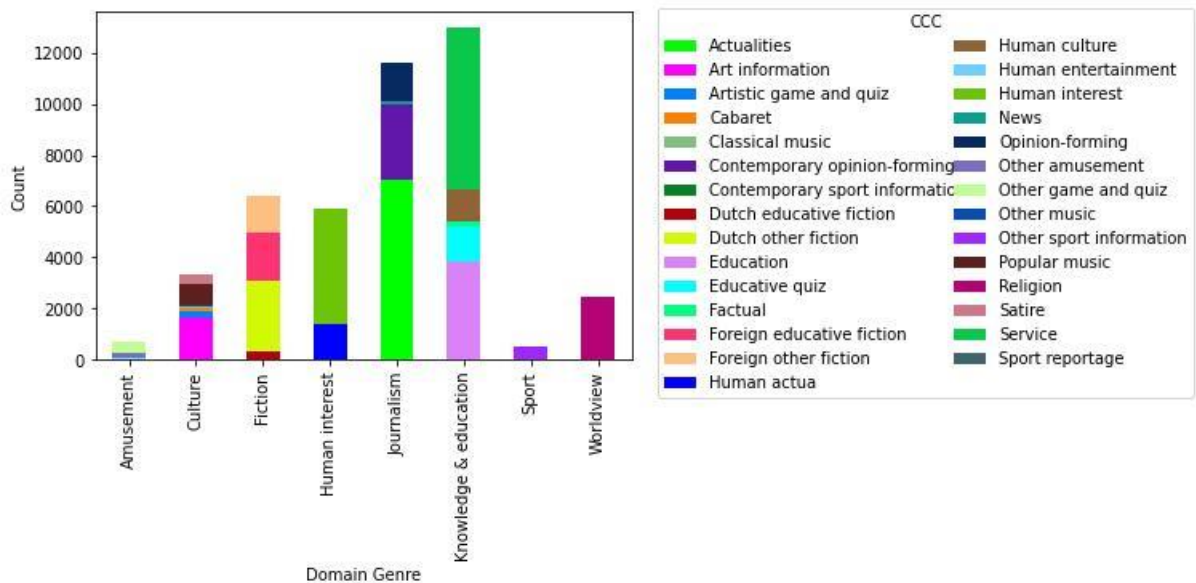


Figure 10: Genre distribution after data preparation

2.4 Ethical and legal considerations

As access was provided to NPO’s confidential information, a non-disclosure agreement (NDA) had to be signed by both parties. This entails that any confidential information related to the data provided must remain secret, including any personal information. This information may merely be shared with the employees and staff of NPO or if NPO has provided written permission. The information and personal data may solely be used for the purpose of conducting this research. Therefore, the data are handled securely for all confidential information to remain secret.

Furthermore, with regards to the choices made within the data pre-processing and preparation, ethical consequences could be a result. Namely, excluding particular data, such as the broadcaster ‘NOS’ and the main and subgenres in the metadata, could lead to not providing full inclusion within the analysis. For this research, these steps were deemed necessary, however, perhaps by including these features, the analysis could be broadened within future research to, for example, compare the supply and consumption diversity between the different types of labelling. Moreover, this research could possibly have negative effects on NPO’s policy, as they strive to maintain the public values diversity and pluriformity. This is also reflected by the Dutch media law of 2008. If this research presents low diversity scores, this could indicate that the demand has not been met sufficiently by the supply in content, and perhaps not enough audience groups are met.

3 Methods

3.1 Translation of the research question to a data science question

As mentioned earlier, in order to answer the research question, the research method conducted by van der Wurff (2004) is adopted, yet slightly altered. Their methodology is a good cornerstone for this research, as it distinguishes between different forms of diversity that focus on supply and consumption, in which the programme types (i.e., genres) are central. Here, the concepts of *open* and *reflective diversity* are central, in which *diversity-as-sent* and *diversity-as-received* are pivot, while focusing on the genres. These concepts are applied to the content in terms of episodes, but also to the channels to answer the sub question.

In contrary to the research conducted by van der Wurff (2004), this research does not only focus on television but compares this to on demand to analyse whether there is a difference in diversity between the two. Within on demand, a distinction is also made between users who logged in through a free or premium account. What makes this research particularly interesting is the distinction in consumption possibilities. For linear TV, the audience would merely have one moment in time to consume the content, namely the broadcast time, whereas for on demand, the audience can watch episodes any time after the broadcast time. This could possibly lead to different viewing behaviours, and thus differences in the consumption diversity.

Similar to van der Wurff (2004), a distinction is made between prime time (i.e., 6pm to 12am) and daytime for both linear TV and on demand. Furthermore, the data are grouped by month and year, and all episodes are categorised according to their genre. Within the analysis, it is crucial that the genres are distinct, thus the eight domain genres (i.e., Table 2) are used. Additionally, to answer the sub question, the same measurements specified by van der Wurff (2004) to define the diversity scores of and between channels are applied, namely *intra-channel diversity* and *inter-channel diversity*, respectively. Here, however, the channels are specifically within NPO rather than the broadcasters. This was decided as this research aims to focus on NPO specifically. Overall, the diversity scores are calculated by applying the formulas stated in van der Wurff's research (2004), which will be discussed in the next section. Moreover, by relating this research to the research conducted by van der Wurff (2004), it could be stated whether the supply and consumption diversity has changed over the last few years in comparison to the 1990s.

3.2 Measuring diversity and competition

To operationalise diversity of both linear TV and on demand, the concepts of *open diversity* and *reflective diversity* are addressed. These are important to look at because these indicate whether the supply is 'sufficiently' diverse. *Open diversity* reflects on the extent to which the content is heterogeneous. Here, a distinction is made between *diversity-as-sent* and *diversity-as-received*. The former resembles the heterogeneity of genres provided by NPO, or in other words, the supply diversity. The latter resembles the heterogeneity of genres viewed by the audience, or in other words, the consumption diversity. Both concepts are relative measures that provide insight on which genres are represented in the total supply or consumption. As van der Wurff (2004) has argued, an increase in diversity of supply may result in a fragmentation of content, which in turn reduces the diversity of consumption. By looking at both concepts, a possible trend can be acknowledged with regards to an increase or decrease in diversity (McQuail, 1992). *Reflective diversity*, on the other hand, occurs when the genres that are demanded by the audience are present, or in other words, when *diversity-as-sent* and *diversity-as-received* are equal (van der Wurff, 2004; van der Wurff & van Cuilenburg, 2001).

These diversity scores are measured by transcribing the formulas presented in Figure 11 using Python and Pandas. By doing so, it could be stated whether NPO's supply of genres in their content meets their audience's demands or whether these could be improved. Regarding the measurements, the formula provided for *open diversity* is applied to measure both *diversity-as-sent* and *diversity-as-received* individually. Here, the former is translated to the number of broadcasts per genre, which is the same for linear TV and on demand. This is because the episodes are broadcasted simultaneously on both, thus a distinction cannot be made. The latter is translated to the viewing density of the number of broadcasts per genre, where a distinction is made between linear TV and on demand. To measure *reflective diversity*, both *diversity-as-sent* and *diversity-as-received* are reflected on for linear TV and VOD separately.

Hereafter, the Competition Intensity Index is measured by taking the viewing density per channel, while differentiating between linear TV and on demand. This contains a value between 0 and 1, where a higher score represents more competition. Here, HHI stands for Herfindahl-Hirschman Index, which "expresses both the number of channels and their differences in market shares" (van der Wurff, 2004, pp. 234). This also contains a value between 0 and 1, yet a higher number indicates less competition. For on demand, a distinction is also made between users that either have a free or premium account when logged in. After all these steps are done, a time series analysis is conducted for both linear TV and on demand, whereafter these can be compared. This is done by visualising all the diversity scores over the years separately for linear TV and on demand, while also differentiating between prime time and daytime. This way, not only the relations between supply and consumption diversity over genres can be analysed, but also the differences between on demand and linear TV during prime time and daytime. In order to be able to compare all values with regards to the diversity scores, these are normalised to be within a range of zero and one.

Open diversity = $1 - \sum s_i - (1/n) /2$	where s_i = relative supply of programme type i and n = the number of programme types in the market
Reflective diversity = $1 - \sum s_i - d_i /2$	where s_i = relative supply and d_i = relative demand of programme type i in the market (defined as the average viewing time per programme type category in the period under investigation)
Intra-channel diversity = $\sum OD_j /n$	where OD_j = open diversity of channel j and n = the number of channels
Inter-channel diversity = $\sum D_j /n$	where D_j = distinctiveness of channel j and n = the number of channels
Channel distinctiveness = $\sum cs_i - s_i /2$	where cs_i and s_i = relative supply of programme type i by channel j respectively all channels
Competition Intensity Index = $1 - HHI$	where $HHI = \sum m_i^2$ and m_i is the audience share of channel i

Figure 11: Definitions of diversity and competition, extracted from van der Wurff (2004, pp. 234)

Complementary to *open* and *reflective diversity*, *intra-channel diversity* is measured, which refers to the heterogeneity of genres that are provided per channel. This is done for linear TV and VOD individually by taking the average between *open diversity-as-sent* and *open diversity-as-received* for each channel and dividing these by the number of channels in the data (i.e., seven). This is important to look at in societal terms because it would offer a heterogenous supply when the audience is likely to choose a particular channel over a genre. Hereafter, the

distinctiveness of the channels can be calculated by translating the formula stated in Figure 11 in Python and Pandas. Here, the sum is taken of the number of broadcasts per genre subtracted from the number of broadcasts per genre per channel. Once this is calculated for each channel, *inter-channel diversity* can be measured, which refers to the differences in genres between channels. This would offer the audience to view different genres. Here, the sum of the distinctiveness of each channel is divided by the number of channels in the data. As there are various channels available to the public, it is significant to reflect not only on the channels individually, but also as a whole (Hellman, 2001).

Finally, both *intra-channel diversity* and *inter-channel diversity* are visualised as a time series to look at the trends at the level of channels. This is done by visualising the diversity scores, which represent the average per channel and are normalised within a range of zero and one, over the years. *Intra-channel diversity* is measured separately for linear TV and on demand, while also differentiating between prime time and daytime, as *diversity-as-received* is measured for both individually. *Inter-channel diversity*, however, is the same for linear TV and on demand, as this reflects on the supply of content per channel based on the genres, which is the same for both. By visualising both, these trends can be related to the trends in supply and consumption diversity on linear TV and on demand. Furthermore, by looking at the channel diversity in relation to each channel's *open* and *reflective diversity*, it could be stated whether channels are competing with each other with regards to the genres supplied and consumed. If channels offer similar content to the same audience, this could lead to a decline in diversity as well as their audience. As NPO strives for diversity in their supply, this could offer an insight on whether this is achieved in a way to increase the viewing density per channel. Moreover, the diversity scores of the channels could be related to and affected by the budgeting plans of genres by NPO.

The benefits of using these given formulas are as following: as stated by van der Wurff (2004), the formula to calculate *reflective diversity* closely follows the definition. Furthermore, the formula to calculate *open diversity* is mathematically similar to those used to calculate *reflective diversity* and the channel distinctiveness. A limitation, however, is the fact that the data is fairly different within this research, which leads to adjustments in the methodology, as mentioned earlier. Furthermore, although these quantifications of diversity have been used and adjusted by other scholars (van der Wurff, 2004; van der Wurff & van Cuilenburg, 2001; Hellman, 2001), it could be argued that these might be slightly outdated with regards to ongoing platformisation. For example, within this research, adjustments are made accordingly to compare VOD with linear TV, however, VOD offers different viewing possibilities than linear TV, which could provoke alterations in the operationalisation used. Moreover, van der Wurff (2004) refers to programme types in the market, whereas this research merely focuses on what is made available by NPO specifically.

3.3 Average level of diversity per channel

Not only are *open diversity* and *reflective diversity* calculated for linear TV and on demand, but also for the channels individually. As stated earlier, these channels are NPO-specific. These are looked at because the channel diversity could also influence the supply and consumption diversity. First, the average of *open diversity-as-sent* is measured, which takes the number of broadcasts per genre per channel and is divided by the number of genres (i.e., eight). This is the same for linear TV and VOD, as the supply of content is the same, as discussed earlier. Hereafter, *open diversity-as-received* is measured by taking the viewing density of these number of broadcasts per genre per channel, while differentiating between linear TV and VOD. Subsequently, the average of *reflective diversity* can be measured per channel by using these diversity scores. Again, all diversity scores are normalised to be within a range of zero and one

to be able to compare the values. The average level of *open diversity-as-sent* and *reflective diversity* are calculated by applying the diversity formulas to the mean of the frequencies per channel, giving one value for each channel. Therefore, the differences between the means can be assessed by visualising the distribution of the diversity scores per channel, while differentiating between daytime and prime time as well as linear TV and VOD.

4 Results

4.1 Measuring diversity and competition

As mentioned earlier, *open diversity-as-sent* is the same for linear TV and VOD, as the episodes are broadcasted at the same time for both. As can be seen in Figure 12, there are seasonal fluctuations in the supply diversity. Around the summer months, the diversity scores are the highest, namely around 0.8, with the highest score occurring in July 2018, namely 1.0, whereafter this dropped tremendously. This implies that the content offered by NPO is more diverse with regards to the genres during the summer than during the winter. As stated earlier, the more choices offered, the bigger the likelihood of offering the preferences. There are also fluctuations during the winter months every year, ranging between 0.5 and 0.0. Moreover, during these months, the supply is more diverse during daytime than during prime time. This could perhaps be related to people being at home more, aiming to match demand. Also, what stands out is that after the summer in 2018, there was a much larger decrease in supply diversity during prime time than during daytime (i.e., 0.0 compared to 0.3, respectively). The distribution of the frequency of each genre supplied is presented in Appendix 7.2.1 for daytime and in Appendix 7.2.2 for prime time.

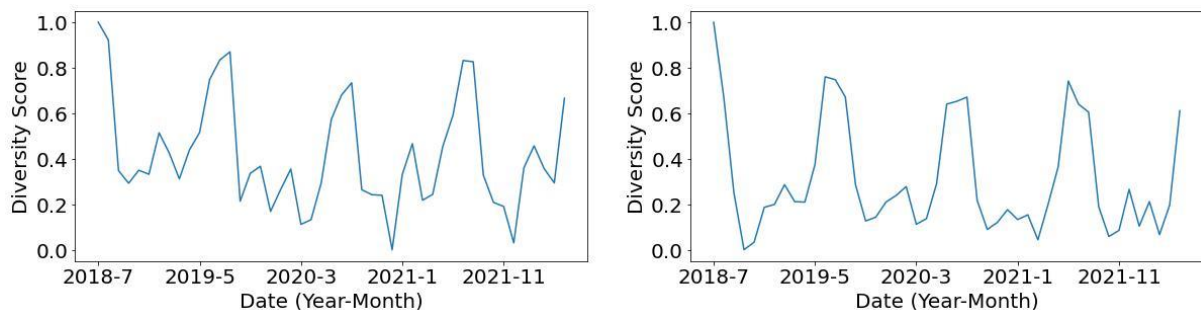


Figure 12: Open diversity-as-sent, daytime (left) and prime time (right)

Within linear TV, there are clear differences visible between the different measures and between daytime and prime time (i.e., Figure 13). These can be looked at separately in Appendix 7.2.3 for daytime and Appendix 7.2.4 for prime time. Overall, various fluctuations are visible within each type of diversity. On first glance, *open diversity-as-received* appears to show similar trends to *open diversity-as-sent* for both daytime and prime time. However, *reflective diversity* shows many fluctuations, which implies that supply does not always meet demand. For daytime, the closest match was around the end of 2019, whereas for prime time this was around October 2021. For daytime, the *reflective diversity* scores are generally higher than during prime time, but there are also larger increases and decreases. Nonetheless, it could be argued that supply matches demand more often during daytime. Additionally, in the beginning of 2020 and 2021, *open diversity-as-received* was smaller than *open diversity-as-sent* during both time frames. This suggests that viewers watched less diverse content with regards to the genres than offered. This is remarkable, as this occurred at the time that the coronavirus spread to the Netherlands and the country went into lockdown. This could imply,

however, that there were more active viewers, who prefer a particular genre. On the other hand, an increase in diversity of supply could lead to fragmentation of content, which would explain the lower scores in consumption diversity. Lastly, the Competition Intensity Index scores were generally higher during the winter months than during summer for both daytime and prime time. This is in align with the supply, as these become less diverse the more severe competition is. For daytime this varied between 0.6 to 1.0, whereas for prime time this fluctuated between 0.7 to 1.0.

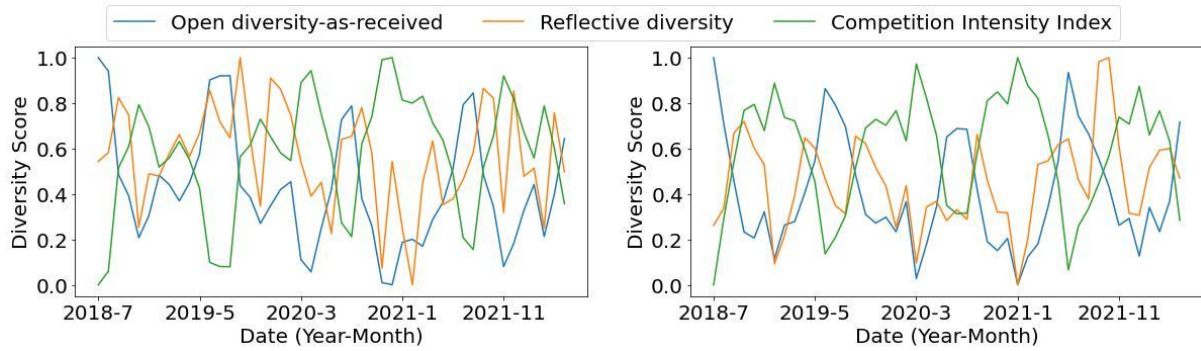


Figure 13: Diversity linear TV, daytime (left) and prime time (right)

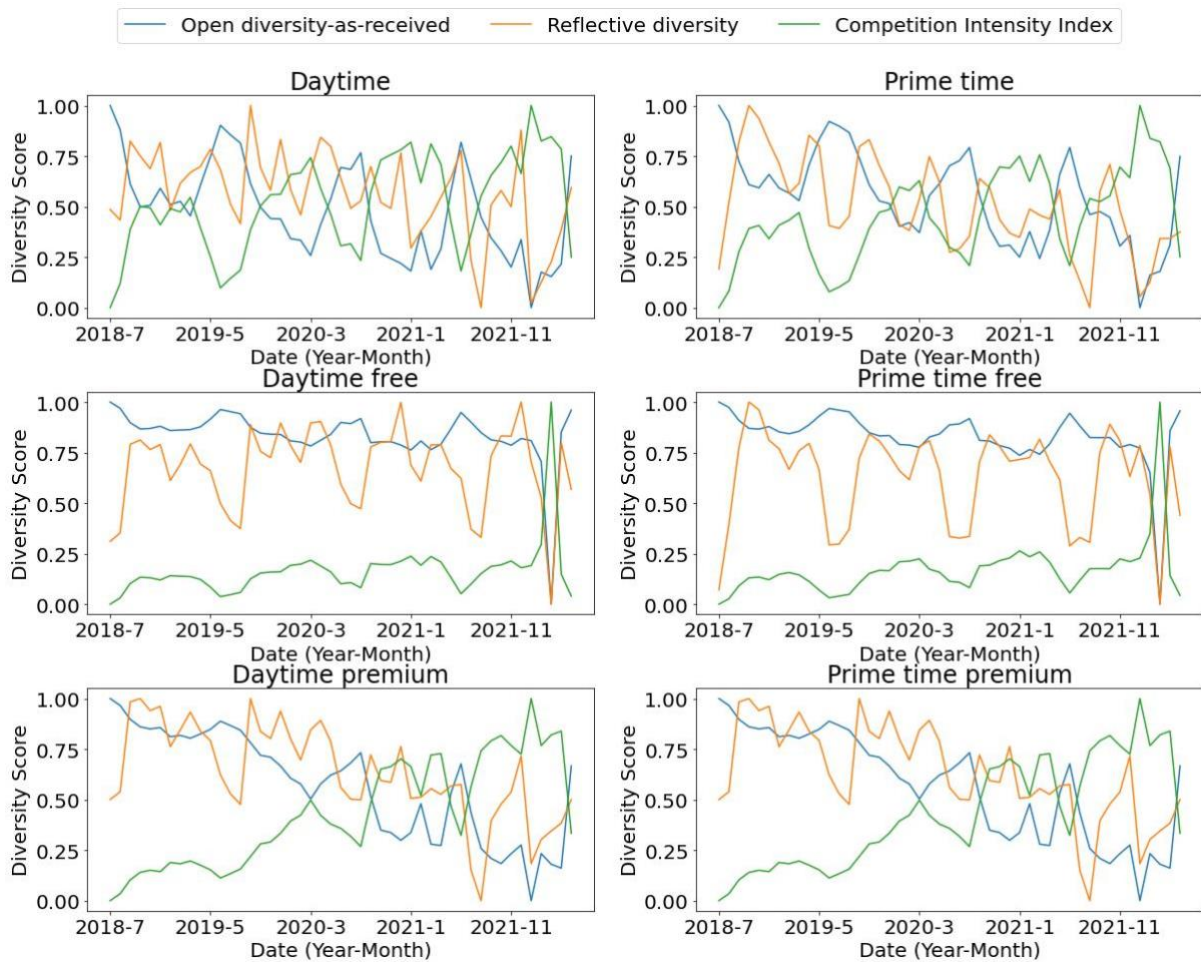


Figure 14: Diversity on demand, daytime (left) and prime time (right)

For VOD, the fluctuations of the measurements are less severe than for linear TV (i.e., Figure 14). The *reflective diversity* scores are much higher for VOD than for linear TV for both daytime and prime time. As the viewing time was higher for linear TV, this could imply that

the audience of linear TV generally include more passive viewers. This could also be related to the fact that there are more consumption possibilities on VOD, or that NPO's programming works well in keeping their audience from ending up in a filter bubble. However, these scores have decreased from 2018 onwards for VOD, with large decreases in August 2021 and January 2022. This is reflected by the fact that *open diversity-as-received* was higher than *open diversity-as-sent*, with a 0.4 decrease for both daytime and prime time during these months. This suggests that the audience watched more diverse combinations of content with regards to genres although less was offered, except during these months. This could be related to corona measurements being lifted around this period and thus people watching less content online. From 2018 to 2022, there was a decrease in *open diversity-as-received* during both daytime and prime time. This implies that the audience watched less diverse content on VOD over the last four years. Hence, they might be active viewers, who choose a particular genre over others. In contrary, there is an increase over this period for the Competition Intensity Index for both daytime and prime time. This shows similar seasonal fluctuations to linear TV, yet in 2018 and 2019 this was around 0.5 for VOD in contrary to 0.8 for linear TV. At the end of 2021 this became more in align when the supply was less diverse.

Besides the comparison between linear TV and VOD, a distinction is also made between free and premium users. All measurements for VOD can be viewed separately in Appendices 7.2.5 to 7.2.10. *Open diversity-as-received* was much higher than *open diversity-as-sent* for free users until the end of 2021, namely between 0.75 and 1.0, after which it decreased tremendously in March 2022. This suggests that although less diversity was offered, free users viewed a diverse combination of content until this period. This is reflected by *reflective diversity*, which also shows seasonal fluctuations for free users during both daytime and prime time. This suggests that the supply matched the demand of free users better during the winter months. For premium users, this decreased during both daytime and prime time from 2018 onwards, with a large decrease in August 2021. This is represented by *open diversity-as-received*, which decreased between 2018 to 2022, especially for premium users. There are a few peaks where it increases, namely during the summer of 2020, 2021 and May 2022. Again, this could be related to corona measurements, such as lockdowns, which lead to the audience watching more diverse content on VOD. Overall, while premium users watched more episodes than free users, this differentiation is not represented in the consumption diversity. Lastly, for free users, the Competition Intensity Index scores very low, namely between 0.0 and 0.25, with seasonal fluctuations, up to March 2021, with a large increase up to 1.0. For premium users, this increased tremendously from the summer of 2019, also showing seasonal fluctuations. Overall, based on these results, the statement that an increase in competition jeopardises diversity of content can be rejected when looking at the consumption diversity. Both linear TV and VOD show that when competition is low, *diversity-as-received* is high, and vice versa.

These observations can be related to *intra-channel diversity* and *inter-channel diversity*. Various fluctuations can be observed with regards to *intra-channel diversity*, with mainly NPO1 representing seasonal fluctuations for both linear TV and VOD, and daytime and prime time (i.e., Figure 15 and 16). For linear TV, there were also seasonal fluctuations for NPO2 during prime time, which suggest that these channels provided more diverse content during the summer than winter. The channels NPOZapp and NPOZappelin provided the most diverse content on both linear TV and VOD. Overall, *intra-channel diversity* scores much higher for the individual channels for VOD than for linear TV, namely between 0.5 and 1.0 and between 0.0 and 0.15, respectively. This implies that the channels provided more diverse content for VOD, whereas for linear TV these are more similar. This could explain the difference in consumption diversity between linear TV and VOD and could be related to the fact that the content can be rewatched over a longer period of time on VOD, while there is merely one consumption moment on linear TV. This does not hold for NPO1, however, which scored lower

than 0.5 for free users in 2022 and during the winter months of 2020, 2021 and 2022 for premium users. All these observations could reflect the ‘duo-strategy’ implemented by NPO, which aims to target particular audiences with their content on either linear TV or VOD. Nonetheless, between the channels, there was barely any heterogeneity in genres until the end of 2021, which quickly decreases again (i.e., Figure 17). Based on the results of the diversity measurements with regards to linear TV, it could be argued that *inter-channel diversity* must be more diverse, to increase the consumption diversity. This would also acknowledge different audiences and prevent market failure.

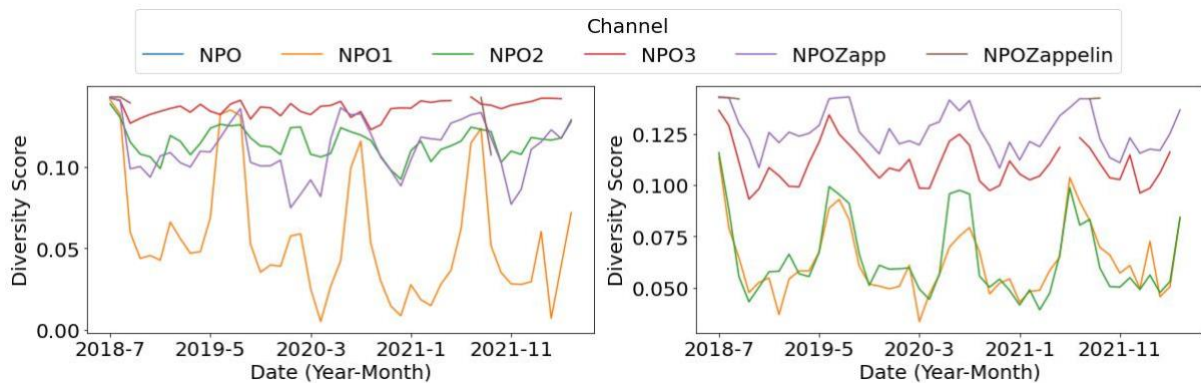


Figure 15: Intra-channel diversity linear TV daytime (left) and prime time (right)

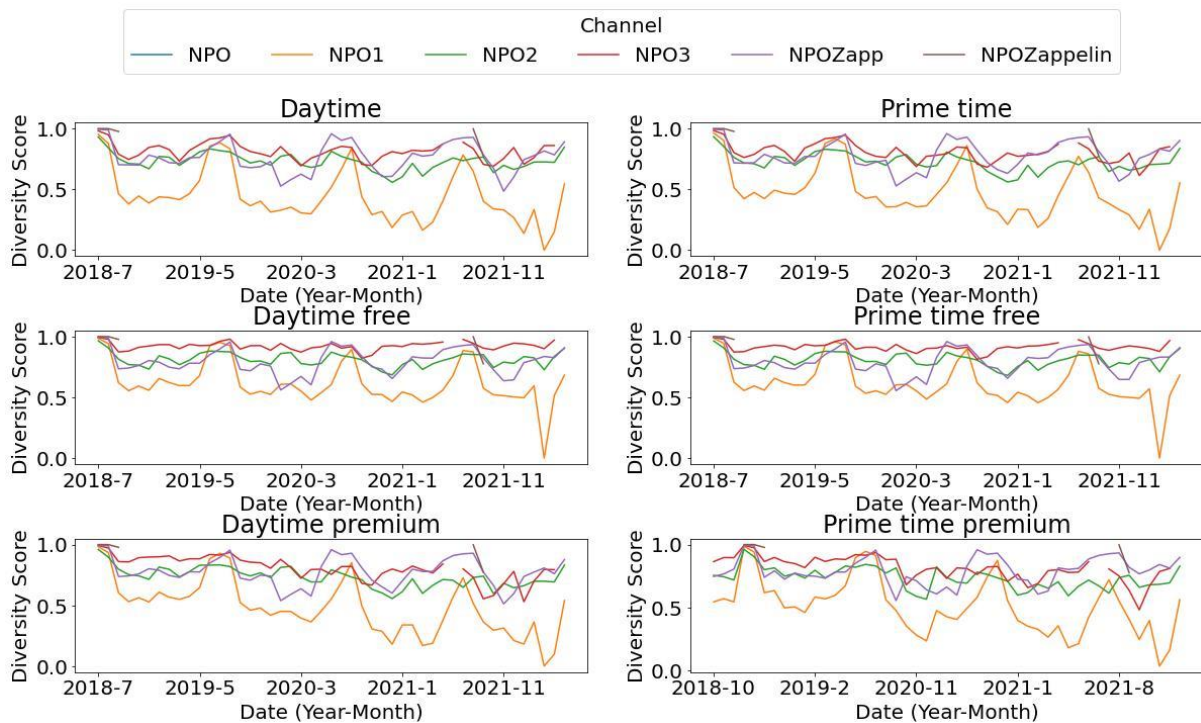


Figure 16: Intra-channel diversity on demand daytime (left) and prime time (right)

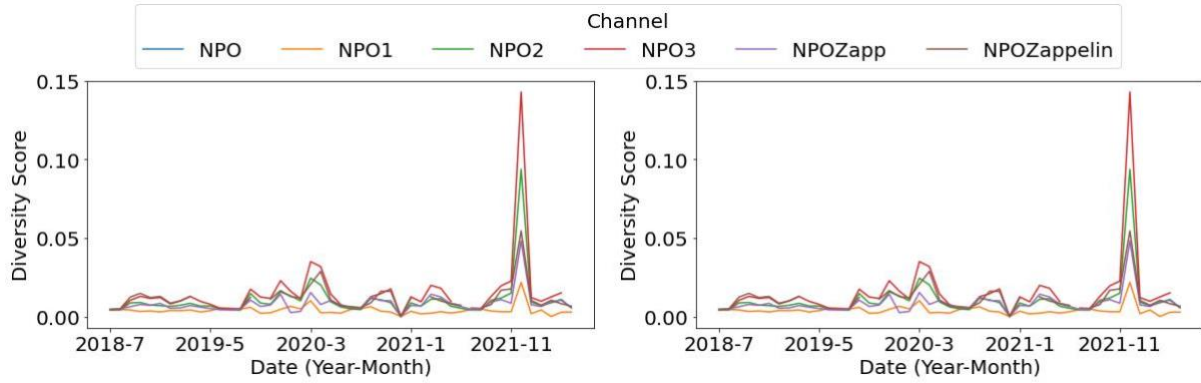


Figure 17: Inter-channel diversity daytime (left) and prime time (right)

4.2 Average level of diversity per channel

As the supply and consumption may be impacted by channel diversity, it is crucial to also look at the individual channels' *open diversity* and *reflective diversity* to determine whether they succeed in providing diverse combinations of content that appeal to the audience. As stated earlier, *open diversity-as-sent* is the same for linear TV and VOD. This is presented in Table 4 together with *reflective diversity* for linear TV. Table 5 shows the *reflective diversity* scores for VOD, including free and premium users. By visualising these scores per channel (i.e., Figures 18 and 19), the differences in the means can be compared.

Table 4: Average level of diversity per channel for linear TV
ODs = open diversity-as-sent, RD = reflective diversity

Channel	Prime time		Daytime	
	ODs	RD	ODs	RD
NPO	0.83	0.39	1.00	0.00
NPO 1	0.38	0.00	0.00	0.00
NPO 2	0.00	1.00	0.59	0.55
NPO 3	0.60	0.72	0.85	0.21
NPO Zapp	0.58	0.89	0.47	0.75
NPO Zappelin	1.00	0.47	0.35	1.00

Table 5: Average level of diversity per channel for on demand
ODs = open diversity-as-sent, RD = reflective diversity

Channel	Prime time			Daytime		
	RD	RD free	RD premium	RD	RD free	RD premium
NPO	0.31	0.32	0.34	0.25	0.24	0.31
NPO 1	0.00	0.00	0.10	0.40	0.38	0.49
NPO 2	1.00	1.00	1.00	0.36	0.37	0.39
NPO 3	0.06	0.10	0.00	0.00	0.00	0.00
NPO Zapp	0.75	0.66	0.93	0.70	0.69	0.75
NPO Zappelin	0.46	0.43	0.56	1.00	1.00	1.00

As can be seen in Figure 18, the channel NPO provides the most diverse content during daytime, followed by NPO3. During prime time, NPOZappelin provides the most diverse content, followed by NPO. This reflects what is deemed crucial by NPO in their supply during

different times on a day, including reaching a younger audience during prime time. Overall, NPO1 provides the least diverse content with regards to the genres for linear TV. During prime time, NPO2 provides high levels of *reflective diversity*, followed by NPOZapp and NPO3, whereas NPOZappelin and NPOZapp do so for daytime. Thus, these channels do relatively well in providing diverse content that appeals to the audience on linear TV. In contrary, NPO1 meets the audience the least during both daytime and prime time.

For VOD, NPOZappelin meets demand during prime time for all users, but not so much during daytime (i.e., Figure 19). This reflects that audiences on VOD watch content during self-chosen times. Here, NPOZapp also does well in meeting the audience during both prime time and daytime, especially for premium users. This reflects that younger audiences view content on VOD. In contrary, NPO3 does not succeed relatively well, yet does slightly better during daytime, mainly for free users. NPO1 does not succeed relatively well in meeting the demand during daytime yet does better during prime time. Although some channels may provide low diversity scores, these may contribute to the overall diversity by offering a narrow range of genres that are not or provided less by the other channels (Hellman, 2001). Comparing linear TV with VOD, it appears that NPO2 and NPO3 meet demand better on linear TV, especially during prime time. Although NPOZapp and NPOZappelin do well on both linear TV and VOD, it could be argued that demand is met better on VOD. This is a positive outcome for the ‘duo-strategy’ implemented by NPO to reach younger audiences on VOD.

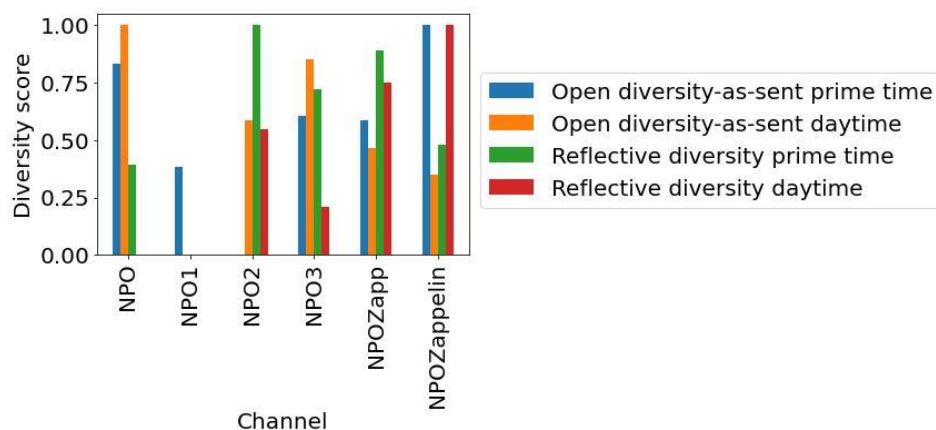


Figure 18: Distribution of average level of diversity for linear TV

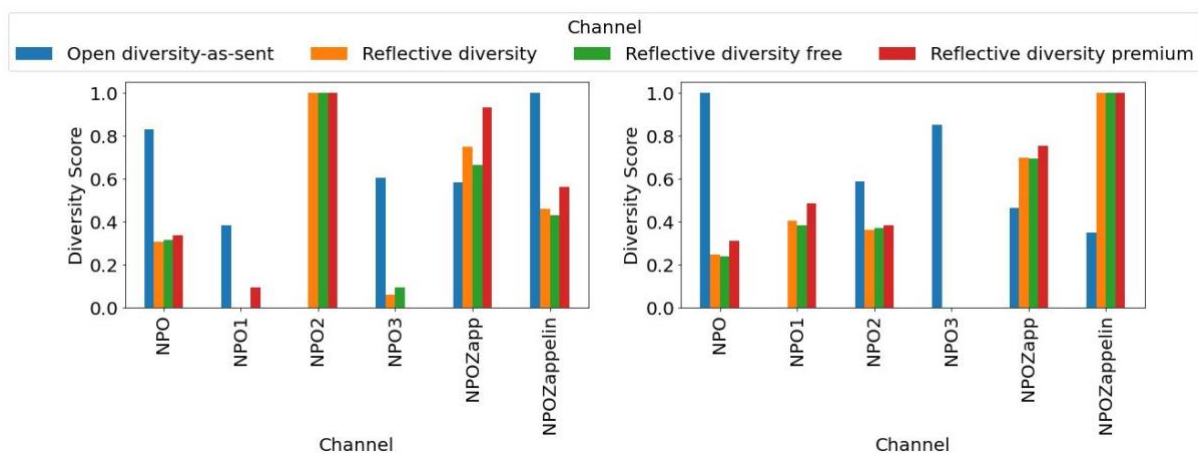


Figure 19: Distribution of average level of diversity for VOD, prime time (left) and daytime (right)

5 Conclusion and Discussion

5.1 Answering the research question as a data science question

This research aimed to analyse whether there is a difference in consumption diversity of genres between linear TV and on demand with regards to the content provided by NPO and whether this has changed between 16 July 2018 and 22 May 2022. This is significant to look at as NPO has a public task to reach different audience groups by maintaining the public values diversity and pluriformity. There were two hypotheses formulated, namely that the supply and consumption diversity of genres differ between linear TV and on demand, and that this includes differences between prime time and daytime. This was extended by including an analysis of the supply and consumption diversity of and between channels. In order to be able to accept or reject these hypotheses and answer the research questions, the operationalisation conducted by van der Wurff (2004) was adopted, yet slightly altered accordingly to the data and to be able to compare linear TV with VOD. Therefore, the concepts of *open diversity-as-sent*, *open diversity-as-received*, and *reflective diversity* were adopted to analyse whether the content was ‘sufficiently’ diverse. Furthermore, channel diversity was looked at, as this could influence the supply and consumption diversity, including *inter-channel diversity* and *intra-channel diversity*. These were all visualised as time series for linear TV and VOD during both prime time and daytime, while also differentiating between free and premium users on VOD. By doing so, the different channels, users, and time frames could be compared with regards to the different concepts of diversity, while focusing on genres. Additionally, the competition of channels was looked at, which influences the content that the audience watches.

This research acknowledges that there are differences visible between linear TV and VOD and between daytime and prime time as well as of and between the channels. This can be explained by interpreting the results. Firstly, it was shown that the audience of VOD watched a more diverse combination of content with regards to the genres than on linear TV. As the viewing time was more for linear TV than for VOD, this could imply that viewers of linear TV are rather passive by following the channels schedule. Moreover, this difference could be the result of NPO’s programming implemented in 2008, which ought to keep viewers out of a filter bubble. Hence, it can be argued that NPO’s integral programming performs relatively well on VOD, aiming to reach different audience groups. However, the levels of *reflective diversity* decreased over time for VOD, which implies that the audience of VOD includes more active viewers, who choose a particular genre over a channel. These observations are reflected by the competition, which was low for VOD, but increased over time. This is similar to what van der Wurff (2004) observed happened in the 1990s, when the increase in hours of programming lead to a decrease in consumption diversity and an increase in competition. The latter requires NPO to respond more to their audience, having impact on cultural and social elements in society. For linear TV, the levels of *reflective diversity* were especially high during the winter months. This reflects *open diversity-as-sent* and *open diversity-as-received*, as there was more diverse content offered during the summer, which in turn could lead to fragmentation of content and thus lead to lower consumption diversity. Similarly, during the beginning of 2020 and 2021, *open diversity-as-received* was smaller than *open diversity-as-sent*, which could be the result of corona spreading to the Netherlands. For linear TV, there were many fluctuations in the levels of diversity, yet it could be argued that the supply matched demand better during daytime.

With regards to free and premium users, the results showed that until 2021, *open diversity-as-received* was higher than *open diversity-as-sent* for free users. This suggests that free users watched more diverse content from 2018 to 2021, although less was provided. This is also reflected by the competition, which was low until March 2021. *Reflective diversity*

showed seasonal fluctuations, which were higher during the winter months, as the consumption diversity was higher than the supply diversity. For premium users, however, there was a decrease in *open diversity-as-received* from 2018 to 2022. This suggests that premium users may become more active viewers, who choose a particular genre over channels. There were increases in consumption diversity during the summer months of 2020, 2021 and in May 2022, which could be related to the lockdowns that occurred due to corona. Hence, perhaps viewers broadened their viewing behaviour with regards to genres during these time periods as they were inside more.

The channel diversity showed that the individual channels provided more diverse content on VOD than on linear TV, which could be a result of having a longer period of rewatching content on VOD. Generally, NPOZapp and NPOZappelin provided the most diverse content with regards to the genres, especially during prime time. Between the channels, there was barely any heterogeneity of genres, except for a peak at the end of 2021. It could thus be argued that NPO must provide more diversity between channels, as this would increase the consumption diversity, acknowledge different audience groups, and prevent market failure. Furthermore, the average levels of *open diversity-as-sent* and *reflect diversity* per channel showed differences between linear TV and VOD, and between prime time and daytime. Namely, NPO supplied the most diverse content during daytime, and NPOZappelin for prime time. This reflects what is considered crucial by NPO, such as reaching younger audiences during prime time. Moreover, NPO2 and NPO3 met demand best with regards to their supply on linear TV. Although NPOZapp and NPOZappelin met demand relatively well on both linear TV and VOD, these channels did especially well on VOD. This suggests that the ‘duo-strategy’ implemented by NPO performs well, in which they ought to reach younger audiences on VOD. Furthermore, while NPOZappelin did well relatively well in meeting demand during daytime on linear TV, this was the case during prime time on VOD. This reflects that the audience on VOD tend to watch content during self-chosen times. While NPO1 did not meet demand well on linear TV nor VOD, they may contribute to the overall diversity by offering a narrow range of genres that could be provided less by other channels. However, this would have to be further analysed.

Overall, these observations lead to the conclusion that NPO does relatively well in meeting demand by implementing ‘integral programming’, however, they could try to nudge their audience of linear TV to watch more diverse content by offering more diverse content between channels or alter their scheduling so that the viewers do not merely watch one genre. By doing so, NPO could nudge their audience to view more diverse content and so contribute to maintaining pluriformity and diversity. Furthermore, by investing in linear TV, the on demand channels are strengthened, which would lead to NPO remaining relevant and appealing to their audience. Lastly, NPO could respond more to their audience to maintain social welfare, as competition has been increasing over the years. As this is NPO’s goal for the next few years, it would be interesting to examine after this concession period whether their new implementation of ‘integral programming’ improved the levels of diversity.

5.2 Implications and future research

Within this research, the supply and consumption diversity of linear TV was compared with that of VOD, which has not been done in research before. Thus, while implementing an operationalisation that has been applied by other researchers (van der Wurff, 2004; van der Wurff & van Cuilenburg, 2001; Hellman, 2001), this would possibly have to be altered due to platformisation. This is because VOD offers different viewing possibilities than linear TV, namely rewatching content over a longer period of time, and thus the operationalisation might be slightly outdated. Furthermore, various limitations were encountered when working with

the data. Firstly, while comparing linear TV with VOD, merely the first broadcast was included for linear TV, while there are various consumption possibilities on VOD. Although this made the comparison especially interesting, this could lead to different results if both channels included multiple consumption opportunities. Furthermore, within the data exploration, the viewing time was looked at over the whole period, rather than looking at changes over time. This way, these observations could not be related to particular periods of time where changes were observed in viewing behaviour with regards to the consumption diversity. Other limitations include that the analyses merely focused on one type of labelling, which could lead to different results than the labelling that provides information on the content and type of programme. Additionally, this research compared free and paid users who were logged into VOD service, yet users that were not logged in could show different viewing behaviours.

Therefore, within future research, the supply and consumption diversity of the different types of genres could be compared, rather than merely focusing on the internally labelled genres, as was done in this research. Here, a distinction could also be made between episodes and series. Furthermore, this research mainly focused on NPO, which meant that the channels were analysed, whereas future research could also look at the diversity levels of broadcasters in order to see whether there are differences or similarities in diversity visible between broadcasters. These could affect the supply and consumption diversity as well. Another way to broaden this research would be to analyse how many days after the broadcast the audience generally tend to watch an episode on VOD. This could be compared to linear TV by including re-broadcasts. Lastly, a regression analysis could be performed to analyse the cause of the different types of diversity, such as the month or day in relation to the viewing time on both linear TV and on demand and prime time and daytime or the budget per channel in relation to the types of diversity. Overall, as Hellman (2001) has stated, diversity in itself should not be considered as the end. Thus, rather than merely focuses on diversity in genres, as has been done in this research, various dimensions of diversity could be analysed.

5.3 Ethical implications and consideration

As mentioned earlier, an NDA was signed stating that any confidential information related to the data must remain secure. Furthermore, the information and personal data may solely be used for the purpose of conducting this research. As this research did not include any personal information of users, this was not considered to be an ethical implication while conducting this research. Other ethical implications and considerations that may have impacted the conclusions made based on the results include the following. Firstly, as mentioned earlier, this research merely focused on one type of labelling of genres, which does not provide full inclusion within the analysis. Therefore, future research could analyse whether there are differences visible between the types of labelling. Furthermore, this research has shown that NPO's supply meets demand better on VOD than on linear TV, which implies that their policy needs improvement to reach different audience groups. This is especially necessary to maintain the public values diversity and pluriformity, which is a crucial demand by the Dutch media law of 2008. Furthermore, *inter-channel diversity* showed that there is not much heterogeneity between channels, which means that the demand has not been met sufficiently by supply in content. This is significant to reach different audience groups and thus to bring people together. This research did show, however, that NPO's 'duo-strategy' to reach younger audiences on VOD performs relatively well. Therefore, it could be argued that this research has ethical implications with regard to the supply and consumption supply in some respects.

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7 Appendix

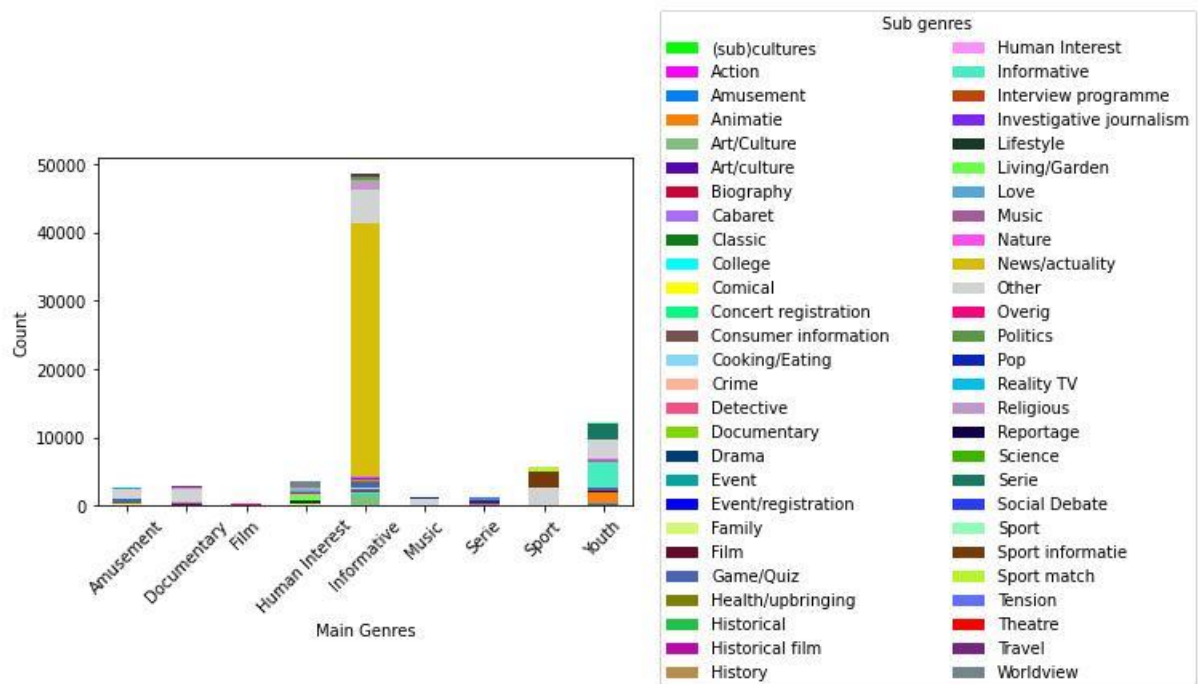
7.1 Data exploration results

7.1.1 CCC Definitions

Domain	CCC-names	Definition
Journalism	News	News facts that may be interpreted in a limited way and (live) reports of newsworthy events
	Actualities	Exploratory, interpretation, and contextualisation of news facts of that moment
	Contemporary opinion-forming	Contemporary themes/topics of political, social or economic importance
	Opinion-forming	(Personal) opinions/points of view of (personal) experiences about political, social or economic topics. Also programmes with analyses and backgrounds with a reflective character
Sport	Contemporary sport information	Contemporary information about sport with results, flashes, and summaries and programmes with backgrounds and flashbacks/reviews of current sport (events)
	Other sport information	Sport that are not directly related to actualities
	Sport reportage	Live reports (complete or partly) about sport matches/events. Also integral reports that are not broadcasted live.
Culture	Art information	Art as the subject, such as visual arts, architecture, music(movements), performing arts, art history, literature, film, etc. Does not include programmes that mainly consist of music or concert registrations
	Artistic game and quiz	Competition in which a certain degree of artistic quality is necessary to compete with other candidates
	Cabaret	Registration of cabaret (performance)
	Satire	People or (contemporary) events/themes/trends are mocked. Satirical improvisations are central
	Popular music	Pop music and dance accessible for a broad audience
	Classical music	Music produced by, or rooted in, Western ecclesiastical and secular music traditions, roughly from the Middle Ages to the present. The core rules of this tradition were established between 1550-1900. The vast majority of the compositions are notated in one way or another
	Other music	Other music and dance such as jazz or world music that is merely interesting to a small group of people and is not clearly present in society
Amusement	Other game and quiz	Game show with a (purely) scattering character in which (individually or in teams) compete with each other, possibly supplemented with other distracting elements (e.g. performs by artists)
	Human entertainment	Provision of insight into the character, motivations, and social vision of the main characters, but in which a serious

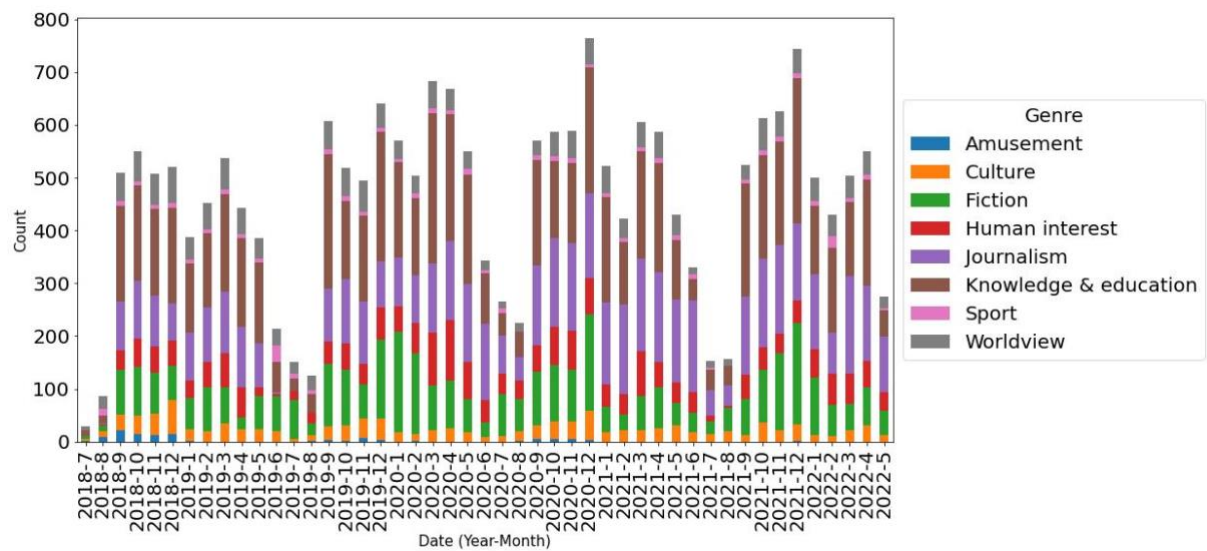
			social/psychological issue is not present or subordinate to the form of the program (game, dating, reality)
	Other amusement		Other amusement that cannot be categorised within one of the other categories
Knowledge and education	Human culture		(Sub) cultures and people in all their aspects in which (ideological) views, values, norms, customs, traditions, etc. that are part of a certain (sub) culture
	Education		Transmission of knowledge/promoting interest in topics in various fields such as technology, history, procts, nature and the environment and personal development
	Service		Informs viewer about products or services and provision of tips and information
	Factual		Factual information about non-current events
	Educative quiz		Certain level of knowledge is required to compete with other candidates
Worldview	Religion		Ideas about religious views are conveyed and broadcasts in which religion is central
Human interest	Human interest		Relates to human feelings and circumstances, without linking these to personal ideas from a certain (religious) view and are not of political, social or economic importance. Mainly about everyday emotions and events
	Human actua		People from actualities are central and informative, educative / cultural elements are included
Fiction	Dutch educative fiction		Fiction for children with an educational nature
	Dutch fiction	other	Other fiction (without educational nature)
	Foreign educative fiction		Fiction for children with an educational nature
	Foreign fiction	other	Other fiction (without educational nature)

7.1.2 Distribution of main and subgenres in the metadata, per series

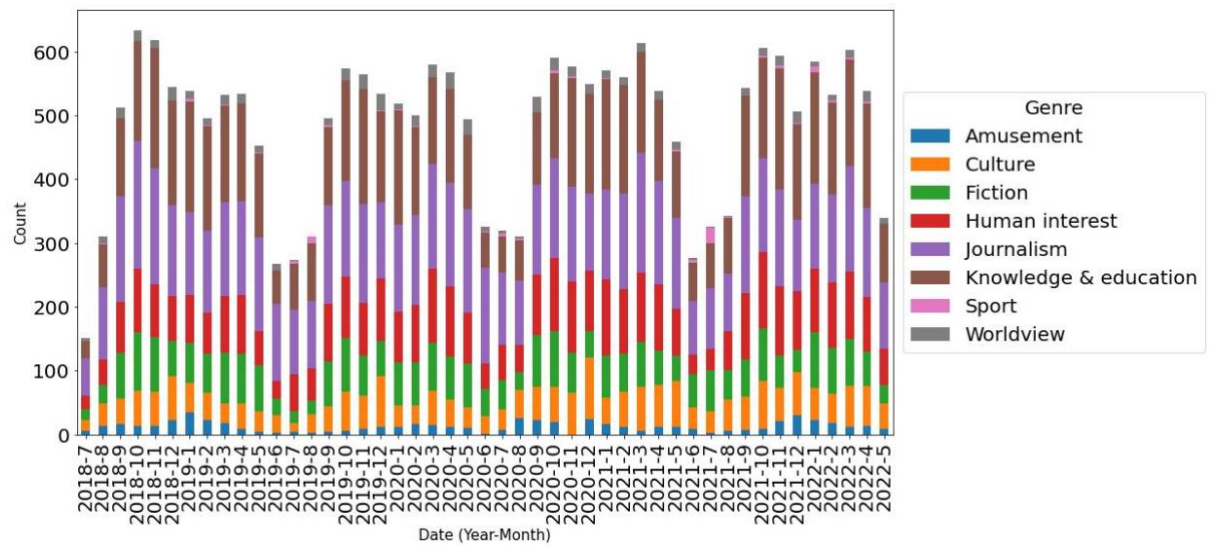


7.2 Analysis results

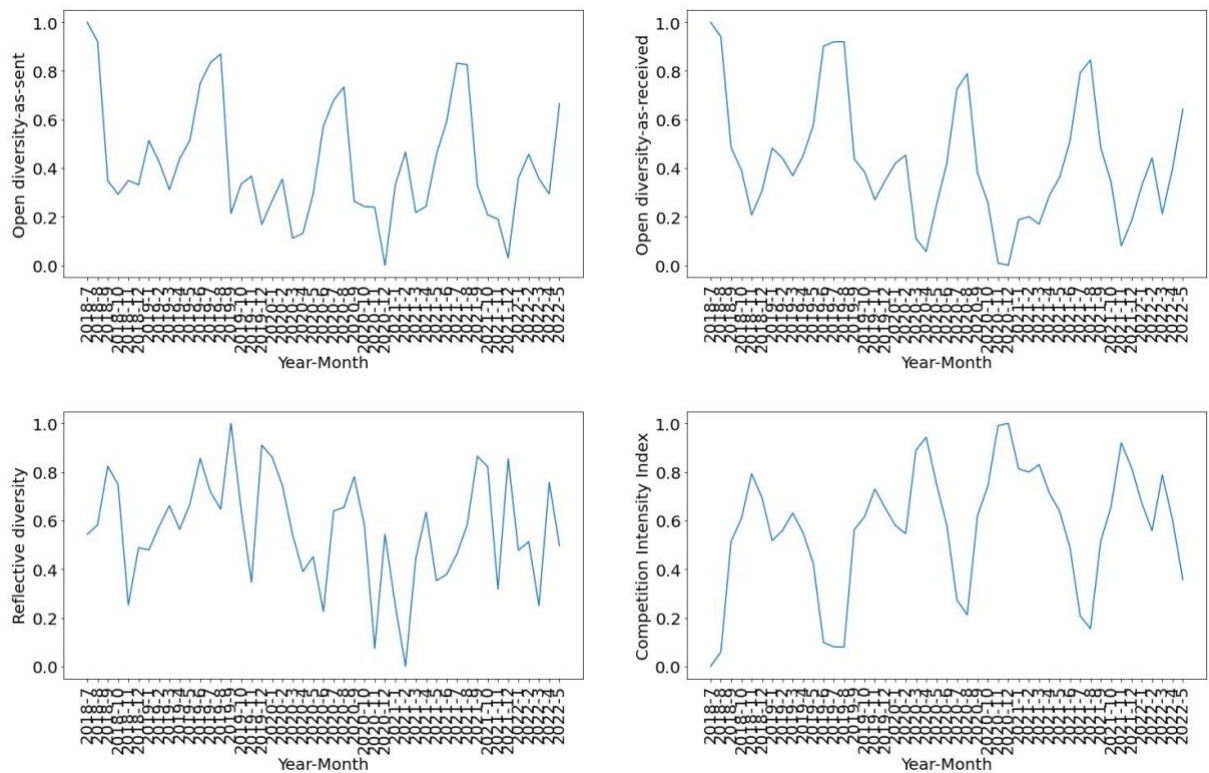
7.2.1 Distribution frequency of each domain genre daytime



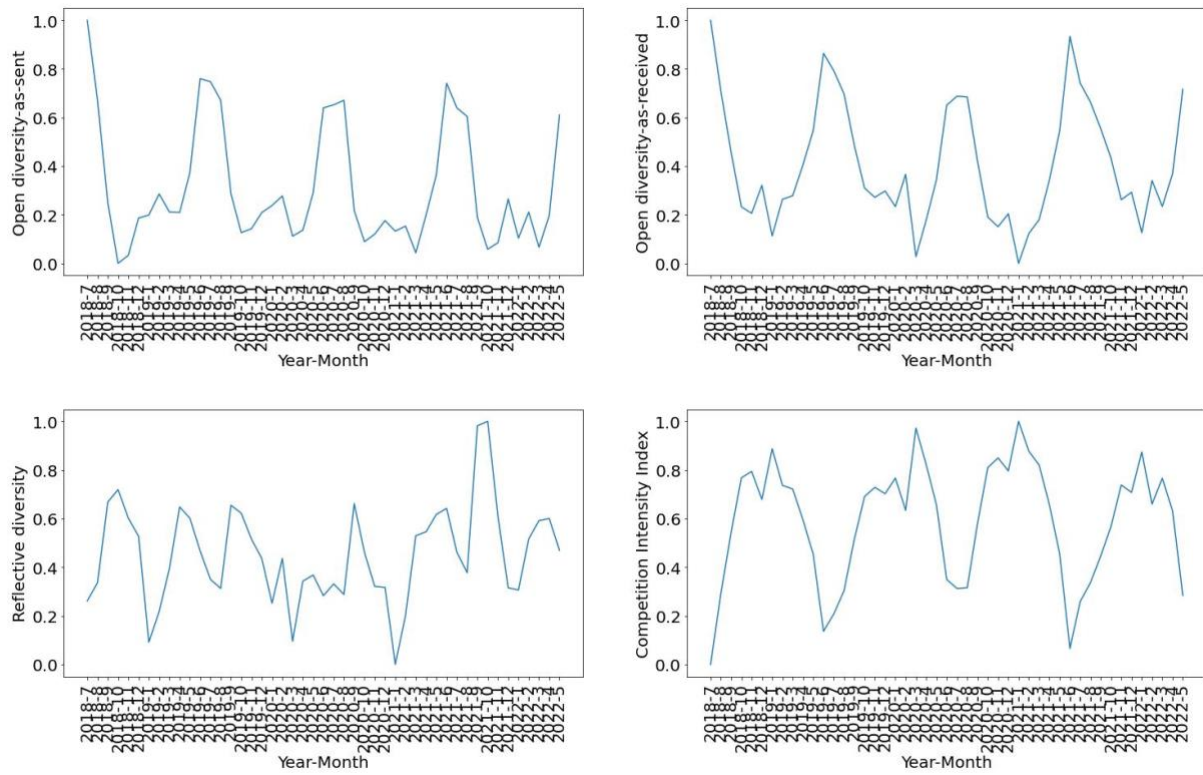
7.2.2 Distribution frequency of each domain genre prime time



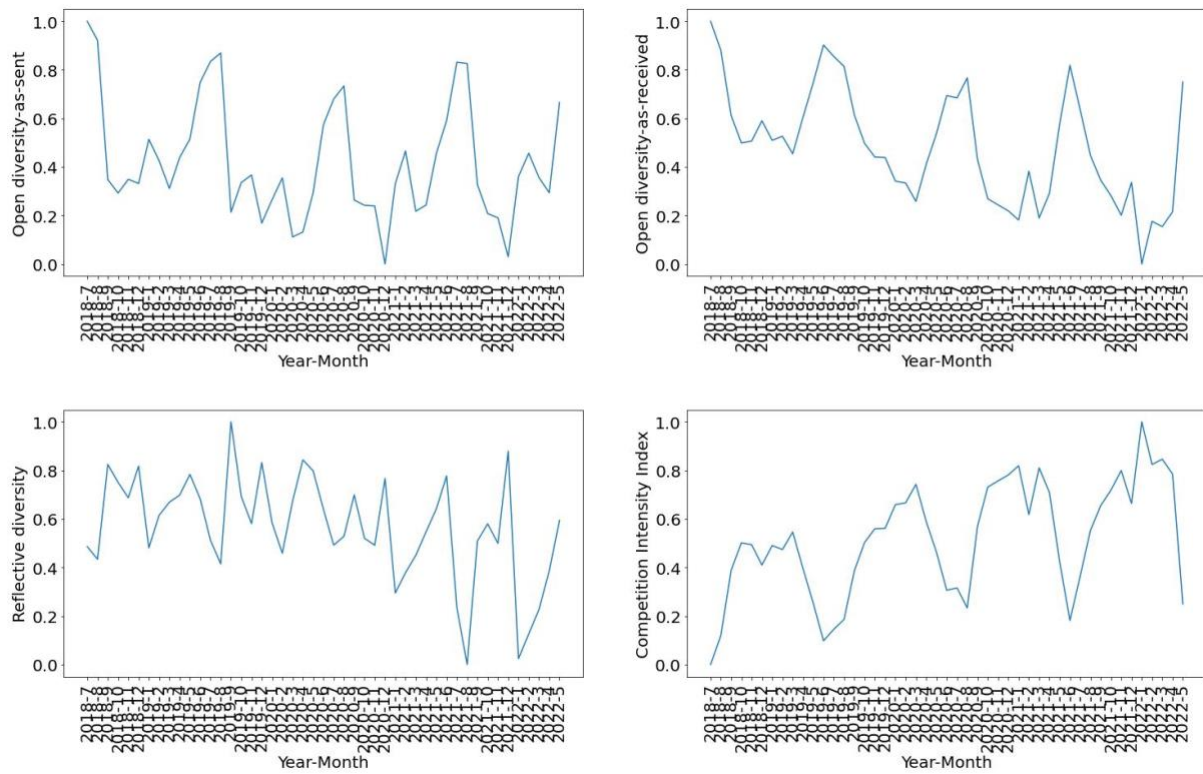
7.2.3 Diversity linear TV daytime



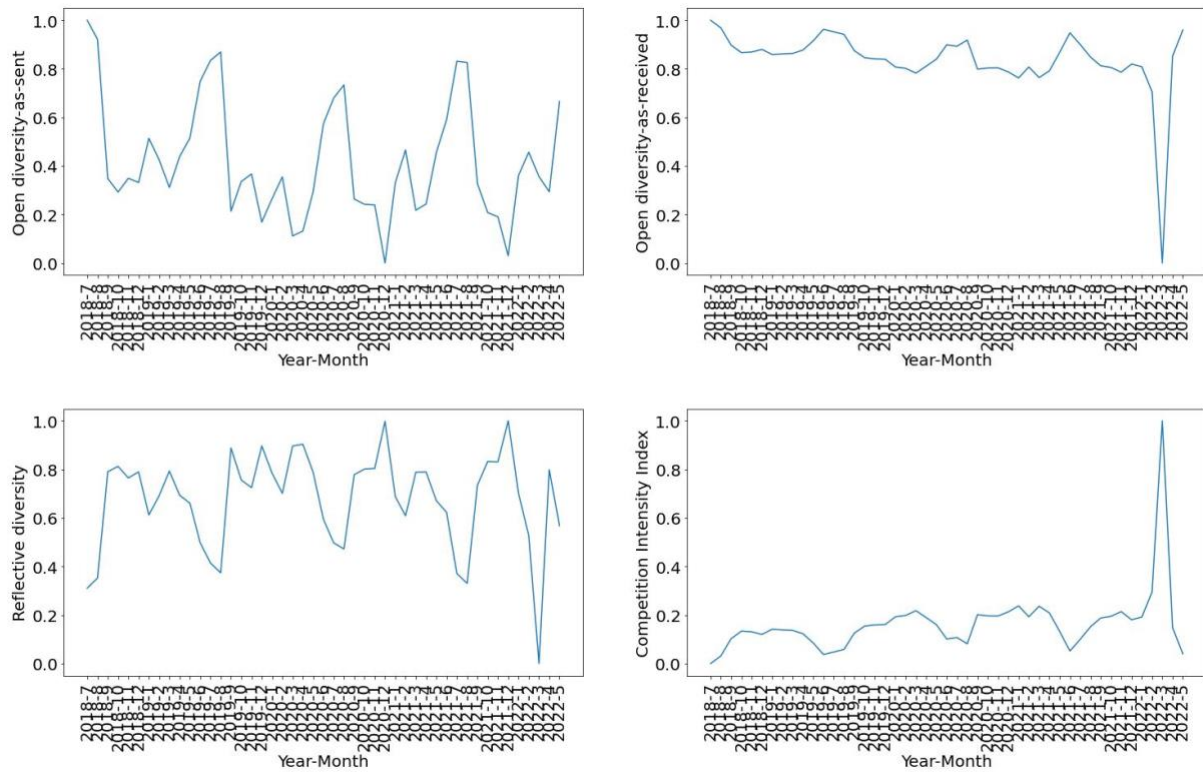
7.2.4 Diversity linear TV prime time



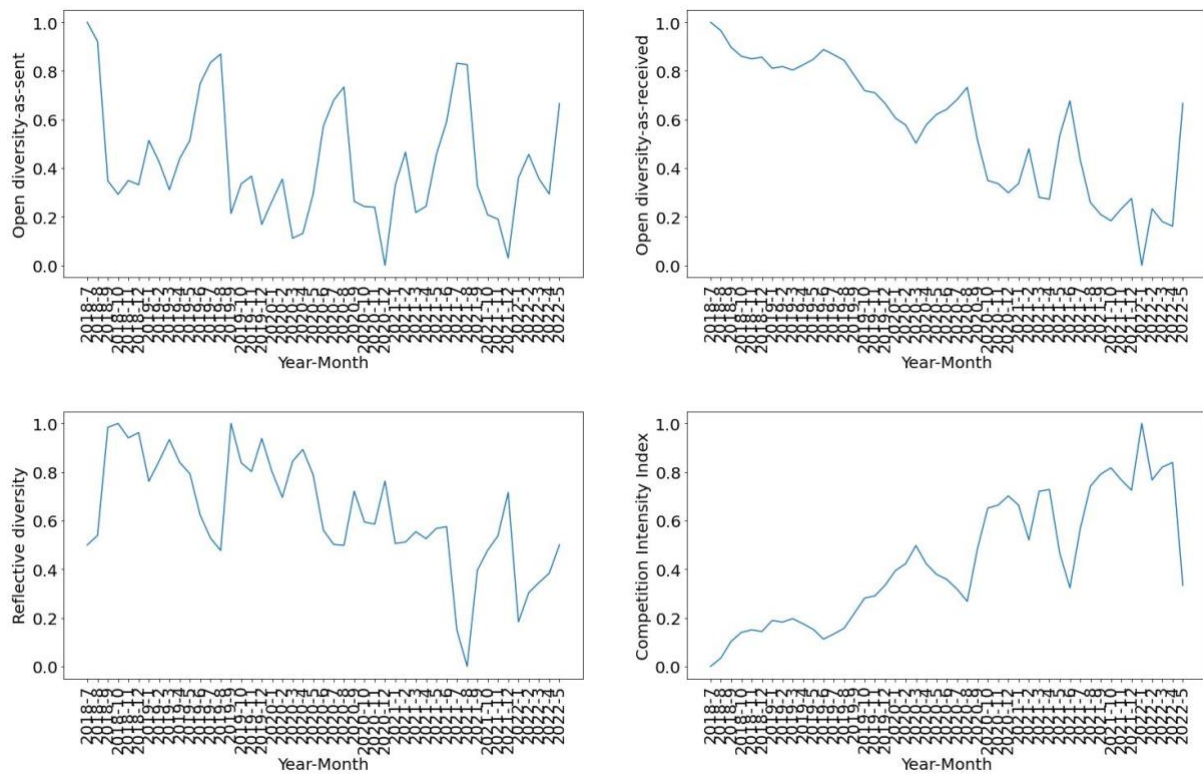
7.2.5 Diversity on demand daytime



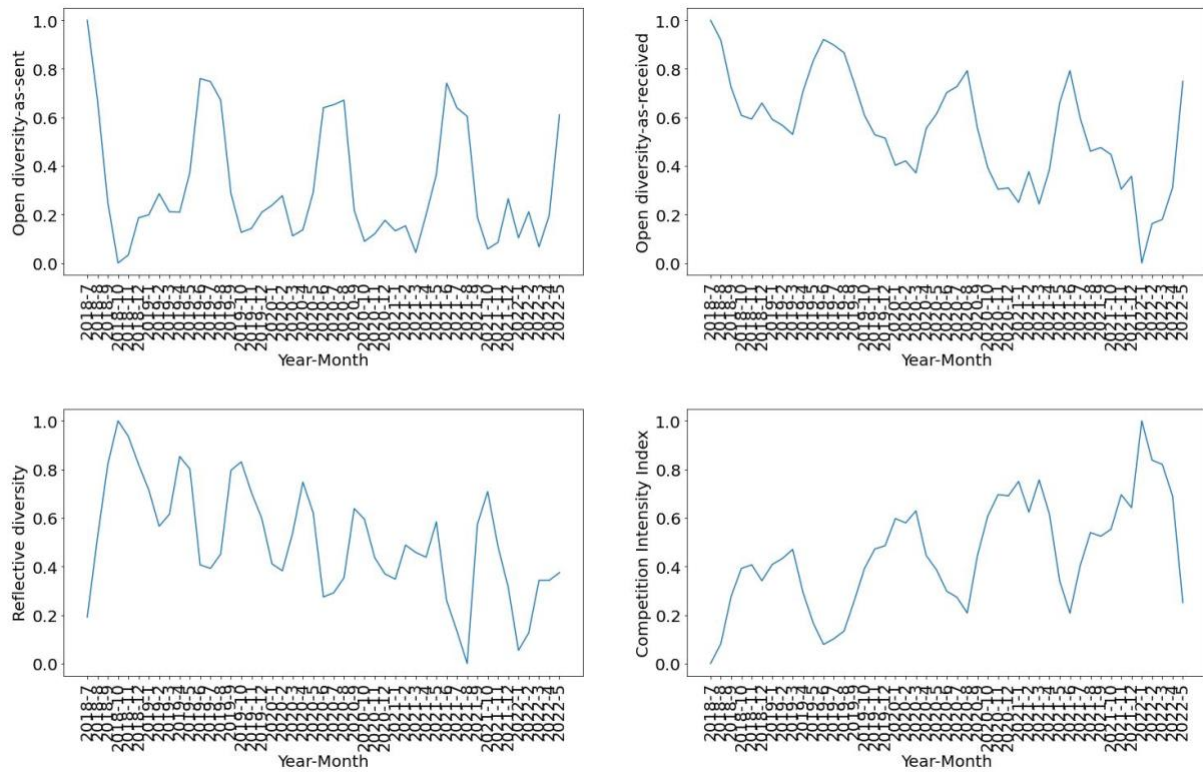
7.2.6 Diversity on demand daytime free users



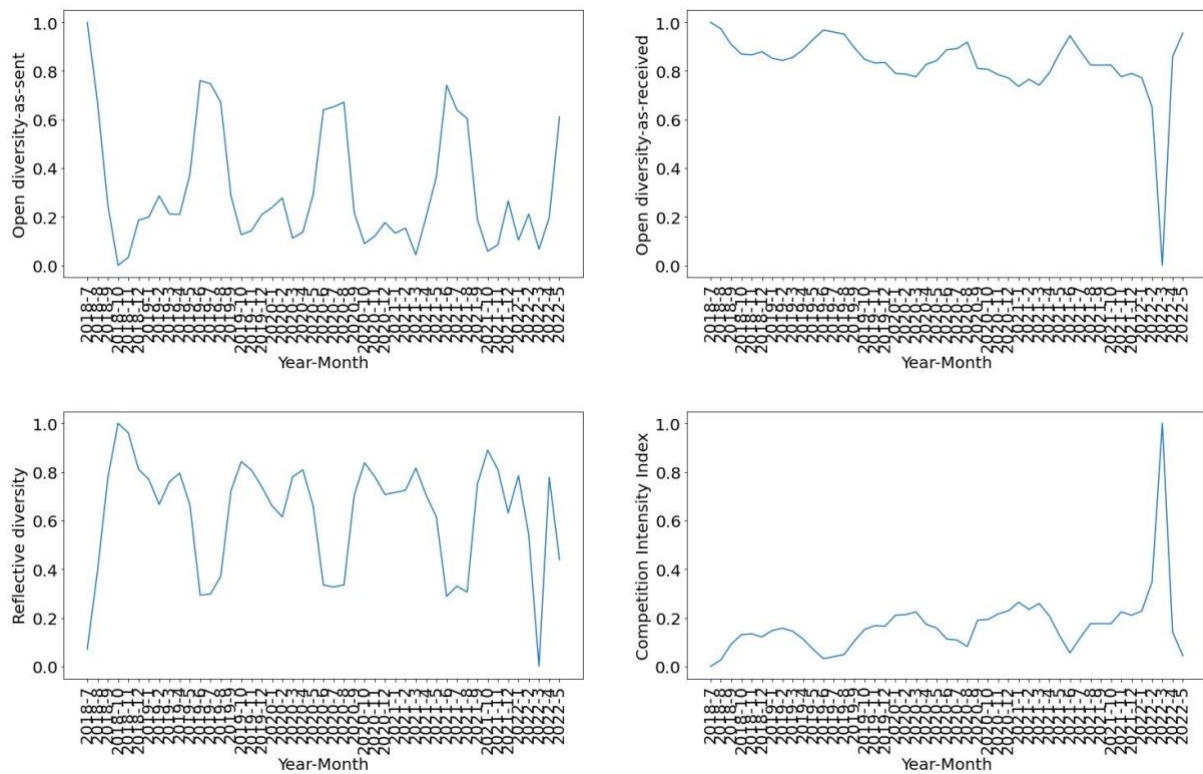
7.2.7 Diversity on demand daytime premium users



7.2.8 Diversity on demand prime time



7.2.9 Diversity on demand prime time free users



7.2.10 Diversity on demand prime time premium users

