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Article

Authorized and Unauthorized Consumption of SVOD Content: Modeling Determinants of Demand and Measuring Effects of Enforcing Access Control

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Abstract: Consumers are attracted by the increasing number of available SVOD platforms, but subscribing to all of them would be too expensive. To reduce costs, consumers could combine the use of proprietary subscriptions, non-proprietary subscriptions, and illegal streaming sites. In turn, platforms could enforce access control, a decision that could produce the desired reduction in non-proprietary subscriptions but also an undesired reduction in proprietary subscriptions. The effects of this decision and the determinants of SVOD content demand remain largely unexplored. We propose a baseline model where the SVOD content demand is driven by variety seeking, household financial situation, ethical evaluation, and social norms, as well as a change model where the subscription variation is driven by users' trait reactance and perceived fairness of the decision. We conducted a survey on the current ways of SVOD content consumption and the responses to a hypothetical access control enforcement, with four randomized versions of the authentication mode. Results confirmed many of the proposed determinants and showed a noteworthy reduction in proprietary subscriptions due to the control enforcement but no effect due to the authentication modes. All these findings may help improve future models on SVOD content consumption and better address the difficult challenge of converting unauthorized users into authorized ones.

Keywords: film business; subscription video-on-demand; account sharing; digital piracy; psychological reactance; fairness theory

1. Introduction

Subscription video-on-demand (SVOD) platforms such as Netflix have opened a successful film distribution channel by providing large collections of shows and movies, which can be viewed much more flexibly than in the past and whose fees are generally considered most convenient [1]. Not surprisingly, SVOD platforms have been cannibalizing audiences from other film distribution channels like cinemas, DVD/Blu-ray, and TV networks [2,3]. The success of the SVOD business has been long attracting new platform providers, but in recent years the market has grown significantly with the entry of major players such as Disney+, Apple TV+, and Paramount+. In response to the supply growth, users have been demanding more and more platforms—for example, the average number of platforms per US household has risen from 2.9 in 2020 to 4.1 in 2022 [4].

As SVOD players differentiate themselves by offering exclusive content and launching new titles directly on their platforms, consumers are probably attracted to a great number of platforms, but subscribing to all of them would imply a high cost. Alternatively, consumers can share the use (and perhaps also the cost) of subscriptions with other households, a practice that violates the terms of service but is relatively common. As an example, 35% of SVOD users in the UK share at least one subscription with others outside of their home [5]. Hence, access to SVOD accounts can basically be done in two ways: through proprietary subscriptions, which are contracted by a household member (subscription holder) and which give the status of authorized users to all household members; and through non-proprietary subscriptions, which are used by members of other households despite being considered as unauthorized users. Another way of unauthorized use consists of viewing SVOD

content through illegal streaming sites, which provide excellent quality and quick access after the release date in SVOD platforms. Remarkably, unauthorized streaming has become the most popular form of digital piracy: in 2022 illegal streaming sites contributed 95% and 57% to the global piracy of shows and movies, respectively [6].

Demand (in number) of proprietary subscriptions, non-proprietary subscriptions, and illegal streaming sites are of great importance for the SVOD industry profitability because platforms receive the fees corresponding to the total number of proprietary subscriptions but do not receive any additional revenue from users of non-proprietary subscriptions and illegal streaming sites. In this situation, platforms could start tightening user authentication to hamper account sharing and ultimately encourage new subscriptions. However, such a decision could be a double-edged sword that would deter both authorized and unauthorized use of SVOD accounts [7]. Interestingly, shortly after our fieldwork, Netflix started forcing authentication for users accessing from an unusual location, but the impact of this decision on the number of subscriptions has not been made public.

We define four research objectives that, to the best of our knowledge, have not been investigated in previous studies: (a) identify what factors motivate consumers to use either more or fewer proprietary subscriptions, non-proprietary subscriptions, and illegal streaming sites; (b) measure how the access control enforcement affects the demand for proprietary and non-proprietary subscriptions; (c) compare the effectiveness of different user authentication modes; and (d) explain the mechanism by which the access control enforcement influences the demands for proprietary and non-proprietary subscriptions.

This study makes some original contributions to the very scarce research on demand for SVOD content through proprietary subscriptions, non-proprietary subscriptions, and illegal streaming sites. From a theoretical perspective, it provides an underlying rationale and empirical evidence for the influence of four factors (variety seeking, household financial situation, ethical evaluation, and social norms) on the SVOD content baseline demand and for the influence of two factors (trait reactance and perceived fairness) on the demand change due to an access control enforcement. From a practical perspective, it confirms that platforms' decision to force access control can lead to a considerable revenue loss, so it is recommended that platforms promote prior awareness of the unfairness of unauthorized SVOD use and that their decision always be accompanied by stimulating benefits and more convincing arguments for users.

What follows is divided into five main sections. The next develops ten hypotheses for the model of baseline demand for SVOD content, four hypotheses on the effects of access control enforcement, and three hypotheses for the model of change in demand for proprietary and non-proprietary subscriptions. The Methodology section describes a Spain-wide online survey where 503 users reported their current consumption of SVOD platforms and their intention to consume after being advised that all platforms would tighten access control, with four alternative procedures that combined the subject of authentication (subscription holder vs. profile user) and the frequency of authentication (monthly vs. weekly). The Results section presents the outcomes of the baseline and change models as well as the effects of the access control enforcement. The Discussion section describes how the expected and unexpected findings can be understood, discusses theoretical and practical implications, and presents limitations and future research directions. The Conclusions section briefly summarizes the key findings discussed in the paper.

2. Hypothesis Development

2.1. Baseline Model

We will now discuss a model where the current demand for proprietary subscriptions, non-proprietary subscriptions, and illegal streaming sites are hypothesized to depend on variety-seeking tendency, household financial situation, and ethical disapproval of unauthorized SVOD use, with the latter in turn depending on the norms internalized from the social environment (Figure 1).

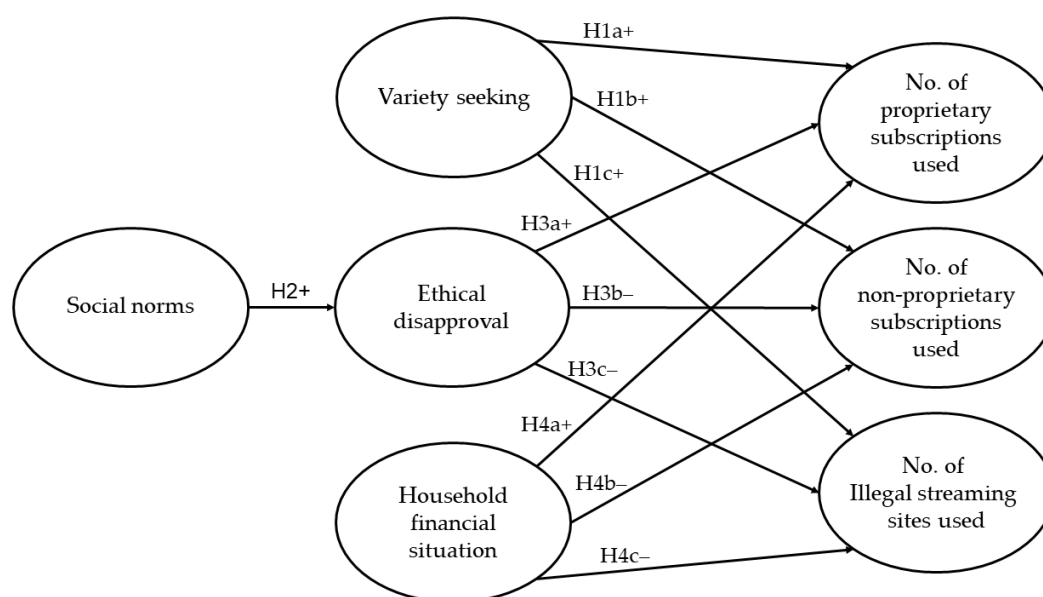


Figure 1. Proposed baseline model.

Variety-seeking tendency is a personality trait that motivates consumers to engage in a diversity of consumption experiences that satisfy their ideal desire for stimulation or excitement [8,9]. This tendency helps predict consumers' choice of a variety of providers in different internet services, such as social networks [10], online retailers [11], and mobile applications [12]. Variety seeking could play the same role with respect to SVOD providers due to some characteristics of this business: (a) each platform only offers a small sample of the total number of shows and movies made at all times; (b) platforms are constantly launching new shows and movies, some of which have not been previously distributed on any channel; and (c) platforms try to differentiate themselves by offering exclusive content, which is specially promoted to attract new subscribers and retain current ones. In view of the above, greater variety seekers will likely use a higher number of platforms, either through proprietary or non-proprietary subscriptions, in order to broaden the range of eligible shows and movies, including more premieres and exclusive content.

Regarding illegal streaming sites, variety seeking was found to increase the inclination to illegal downloading [13]. But now it is time to test whether variety seeking also encourages the practice of illegal streaming, which has been recently reported as the most popular form of piracy worldwide [14]. On illegal streaming sites, consumers have the comparative advantage of finding numerous shows and movies (of any age, type, and origin) that are not available on SVOD platforms. However, as disadvantages, consumers must (a) explore which sites reproduce the sought-after content with the desired quality, (b) identify the frequent domain changes of providers, and (c) take the risks of malware infection and legal liability. Given that variety seeking is intrinsically linked with tendencies toward exploratory behavior, complexity management, and risk taking [9,15], greater variety seekers will likely address these disadvantages more readily than less variety seekers. Therefore, greater variety seekers are expected to use more illegal streaming sites in order to satisfy their desire for more varied film content.

Hypothesis 1. *SVOD users' variety seeking will have a positive effect on the number of (a) proprietary subscriptions, (b) non-proprietary subscriptions, and (c) illegal streaming sites, which they use.*

According to the theory of reasoned action [16] and social cognitive theory [17], individuals develop social norms about the acceptability of many behaviors by observing the attitudes and behaviors of important people around them (e.g., relatives, friends, and colleagues). Indeed, social norms developed by consumers have been found to influence their ethical evaluation of digital piracy [18,19]. However, as unauthorized SVOD use tends to be more socially accepted than digital piracy

[7], social norms' influence on unauthorized SVOD use should be specifically confirmed. Yet a consistent relationship can be expected because unauthorized SVOD use and digital piracy coincide in using digital content without providing fair compensation to copyright holders. We thus propose that the attitudes and behaviors of significant others will affect the assessment of unauthorized SVOD use.

Hypothesis 2. *Social norms will shape ethical disapproval of unauthorized SVOD use.*

The choice of using a proprietary or a non-proprietary platform is quite different from an ethical perspective. The first option involves paying the full subscription cost, though unauthorized users may reimburse a portion, and taking responsibility for complying with the contract terms. The second option involves enjoying the full service without providing any additional compensation to copyright holders. Interestingly, previous research shows that ethical evaluation predicts the intention to subscribe to SVOD platforms [19] and sense of duty predicts the decision to pay the full cost of SVOD platforms [7]. Moreover, as having the experience of carrying out a certain behavior contributes to its justification, which in turn encourages its repetition [20,21], the use of a proprietary (non-proprietary) subscription can ease the use of additional proprietary (non-proprietary) subscriptions. Based on the above arguments and empirical evidence, ethical disapproval of unauthorized SVOD use could reasonably have a positive (negative) effect on the number of proprietary (non-proprietary) subscriptions used by consumers.

Using illegal streaming sites is the least ethical behavior because SVOD platforms do not obtain any compensation from any of the users. Given that attitude toward digital piracy has been repeatedly found to influence the intention to pirate digital products such as movies [22], games [23], and software [24], it can be expected that ethical disapproval of unauthorized SVOD use prevents access to illegal streaming sites. Moreover, since engagement in a digital piracy activity reinforces the intention to intensify the practice of such activity [25], a casual use of illegal streaming sites can stimulate unethically-minded consumers to use such sites more extensively. Thus, ethical disapproval of unauthorized SVOD could reasonably have a negative effect on the number of illegal streaming sites used.

Hypothesis 3. *Ethical disapproval of unauthorized SVOD use (a) will positively influence the number of proprietary subscriptions used, (b) will negatively influence the number of non-proprietary subscriptions used, and (c) will negatively influence the number of illegal streaming sites used.*

Decisions on the number of platforms used and the form of access imply important differences in the total cost and thus can be affected by users' economic status. This status can be measured by both household income, an objective indicator that does not assess expenses and future expectations, and household financial situation, a subjective indicator of whether the available resources are perceived as sufficient to cover additional costs. We chose the second one because household income's predictive power shows mixed results, with a positive effect on the payment of copyrighted content [26] and no effect on the form of access to platforms [7], whereas financial situation perception has a notable influence on spending decisions [27] and more specifically on entertainment expenses [28]. Understandably, a better perceived financial situation will make it easier for users to sign up for additional proprietary subscriptions, regardless of the subsequent increase in the total cost. However, a worse perceived financial situation will facilitate the use of non-proprietary subscriptions and illegal streaming sites to watch preferred film content more cheaply or for free.

Hypothesis 4. *SVOD users' household financial situation (a) will positively influence the number of proprietary subscriptions used, (b) will negatively influence the number of non-proprietary subscriptions used, and (c) will negatively influence the number of illegal streaming sites used.*

2.2. Effects of Access Control Enforcement

Now we will argue (a) why the implementation of a tighter access control system across all SVOD platforms could reduce the demand for both proprietary and non-proprietary subscriptions and (b) how different modes of user authentication could affect the results.

Typically, SVOD platforms have controlled access through single-factor authentication systems, consisting of entering an email or mobile number and a password, which can be saved indefinitely by the device to facilitate subsequent access. Our survey simulated that all SVOD platforms agreed to add a two-factor authentication system consisting of entering a code received periodically through a mobile phone. This control enforcement would be performed only when access was attempted through unknown devices or Internet connections. Remarkably, digital banking platforms employ two-factor authentication systems to enhance security, but customers complain of a deterioration in their user experience [29,30].

Consistent with psychological reactance theory [31,32], the implementation of a new computer security control system may be perceived as a freedom restriction that motivates users to develop negative feelings and responses to such a system [33]. Also consistent with that theory, the implementation of an additional authentication system in SVOD platforms may be perceived as a restriction of personal autonomy and may then motivate users to react negatively to the source of control. Importantly, the more the perceived freedom restriction, the greater the expected negative reactions [31,32]. SVOD users could perceive a significant freedom restriction because access to platforms would be slowed down, authentication would have to be repeated periodically, and last but not least, authorized and unauthorized users would be indistinctly subject to the same control. Understandably, the access control enforcement may be even more negatively perceived by blameless proprietary subscription users, who may then decide to cancel some of the less used/appreciated platforms. In turn, blameworthy unauthorized users may reduce the number of non-proprietary subscriptions used both because of the difficulties caused by the additional control and because of the decision of some legitimate subscribers to stop sharing accounts.

Hypothesis 5. *An access control enforcement will lead SVOD users to reduce (a) the number of proprietary subscriptions used and (b) the number of non-proprietary subscriptions used.*

To explore what mode of user authentication could be more efficient for SVOD providers, we designed four versions combining the subject of authentication (subscription holder vs. profile user) and the frequency of authentication (monthly vs. weekly).

As for the subject of authentication, SVOD platforms would send a code to the mobile phone of either the subscription holder or the user registered in the profile from which access is attempted. Previous research shows that users tend to perceive more negatively those authentication systems that are more difficult [29,34] or more annoying [30,35] to use. If the code is sent to the subscription holder, unauthorized users would have to request and obtain that code from a non-cohabitant, which would entail more effort and the possibility of receiving a negative response. In addition, the subscription holder would probably be more disturbed and interrupted by an authentication request that would benefit non-cohabitants rather than household members. Therefore, an authentication addressed to the subscription holder could reasonably discourage the use of non-proprietary subscriptions more than the use of proprietary subscriptions.

Hypothesis 6. *If the subject of authentication is the subscription holder, compared with that of the profile user, an access control enforcement will have a stronger negative effect on the number of non-proprietary subscriptions used than on the number of proprietary subscriptions used.*

Regarding the frequency of authentication, SVOD platforms would require access authentication to be reinstated either every month or every week. In this regard, the more frequently two-factor authentication systems need to be reinstated, the more annoyed users become [34]. It is thus reasonable to expect that the requirement of a weekly re-authentication, compared to a monthly one, will create a greater disincentive to use both proprietary and non-proprietary subscriptions.

Hypothesis 7. *A higher frequency of the user authentication requirement, compared to a lower one, will have stronger negative effects on both the number of proprietary subscriptions used and the number of non-proprietary subscriptions used.*

2.3. Change Model

Here we propose a model where the use of proprietary (non-proprietary) subscriptions would increase (decrease) when the access control enforcement is perceived as fair by users, whose perception in turn would be affected by their tendency to psychological reactance (Figure 2).

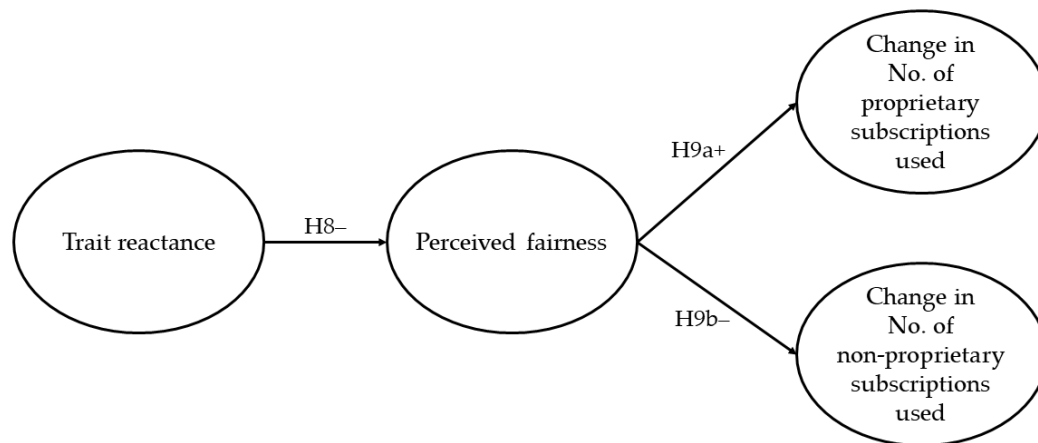


Figure 2. Proposed change model.

Fairness theory [36,37] helps understand users' responses to the access control enforcement, which was presented as a decision based on objective facts: sharing SVOD accounts with other households is prohibited in the contract terms and SVOD content is often consumed from devices and locations that do not match the subscribed households. Fairness theory suggests that the unfavorable situation caused by a decision like the access control enforcement can generate counterfactual reasoning, where the unfavorable situation is compared with the alternative scenarios that other decisions might have caused. Specifically, users can generate *would* counterfactuals (e.g., that account access would have remained as before), *could* counterfactuals (e.g., that the access control enforcement would have been established differently), and *should* counterfactuals (e.g., that the decision would not have been made according to ethical standards). As a consequence, the more favorable the imagined situation in alternative scenarios, the greater the perception that the decision is unfair.

Fairness and reactance theories were successfully combined to improve understanding of users' responses to computer use restrictions by considering the effect of psychological reactance on counterfactual reasoning development [38]. Something similar could occur in SVOD use because the motivation to prevent the access control enforcement may understandably enhance the motivation to counterargue against the platforms' decision. We thus suggest that trait reactance, a stable personality characteristic that determines the proneness to resist freedom threats [39], will enhance all kinds of counterfactual reasoning. In turn, higher levels of counterfactual reasoning will likely lengthen the distances between the imagined alternative scenarios and the tedious situation of a tighter access control, which will make the platforms' decision perceived as less fair.

Hypothesis 8. *SVOD users' trait reactance will have a negative effect on their perceived fairness of the access control enforcement.*

The access control enforcement is intended to ensure that SVOD users comply with the rule of paying the required fees for the content consumed. The enforcement of this rule by platforms has similarities and differences with the enforcement of various rules by regulatory authorities. As a similarity, compliance with the established rules is expected to depend on individuals' perceived

fairness of such rules [38]. For example, citizens are more likely to comply with rules on taxes [40], traffic [41], and COVID-19 lockdown [42] when they perceive such rules as fair. As a difference, regulatory authorities are more able to enforce coercive measures (e.g., fines and penalties) to ensure compliance with the rules. With very little coercive power, platforms should focus on explaining their decisions in such a way that these are perceived as fair [38]. The perception of fairness achieved by the platforms will encourage unauthorized users of SVOD accounts to regularize their situation, either by ceasing to use such accounts or by subscribing to the corresponding services, all of which will produce both an increased use of proprietary subscriptions and a reduced use of non-proprietary subscriptions.

Hypothesis 9. *SVOD users' perceived fairness of the access control enforcement will cause (a) a positive change in the number of proprietary subscriptions used and (b) a negative change in the number of non-proprietary subscriptions used.*

3. Methodology

3.1. Survey Development

We designed a structured questionnaire targeting SVOD users residing in Spain and hired a market research company to conduct online data collection. This company used Cint's digital survey platform, which hosts about 4600 survey panels with nearly 315 million engaged respondents across more than 130 countries. Cint's panelist recruitment is essentially done through a passive method, in which anyone can sign up on a panel's website, and an active method, by which only those invited by the panel's administrators can sign up. Cint encourages respondent participation by rewarding each properly completed questionnaire with cumulative points, which are then redeemable for cash, gift cards, or donations to charity.

The questionnaire was structured in seven parts. First, the SVOD platforms used were either marked among the twelve suggested (Appendix A) with their names and logos or were specified in the option "Others." Second, the form of access to each platform used was selected from among four alternatives: (a) through a subscription from the respondent's household, the cost of which is entirely paid at home; (b) through a subscription from the respondent's household, the cost of which is shared with another household; (c) through a subscription from another household, the cost of which is shared by the respondent's household; and (d) through a subscription from another household, without any payment. Third, a filter question asked whether the subject used any free website to watch shows/movies offered by paid platforms. If the answer was "Yes," the names and logos of fourteen illegal streaming sites (Appendix A) were suggested with the possibility of specifying others. Fourth, the items used to measure the latent variables were rated (the order of presentation of these items was randomized). Fifth, the warning of a new authentication system was presented (the four versions were randomly assigned to participants). Sixth, the new authentication system was assessed using a multi-item scale. Finally, there was a question about how each of the currently-used platforms would be accessed if all of them applied the authentication system presented. This question had five alternative answers: (a) through a subscription from the respondent's household, the cost of which would be entirely paid at home; (b) through a subscription from the respondent's household, the cost of which would be shared with another household; (c) through a subscription from another household, the cost of which would be shared by the respondent's household; (d) through a subscription from another household, without any payment; (e) refusal to continue using this platform.

An initial version of the questionnaire was pretested for suitability using a convenience sample of 104 students from various undergraduate and graduate courses at our university. These students filled out the survey through their smartphones, laptops, or other devices they were using in the classroom. The contracted company arranged for the questionnaire to be properly displayed on any device and on the most popular browsers. After correcting some deficiencies identified and improving some aspects of content and form, the final version of the questionnaire was ready.

The sample size (about 500 valid subjects) was predetermined along with the contracted company based on the available budget. On June 1, 2022, this company began inviting panelists to participate in the survey, which was accessible for three days until the predetermined sample size was reached (ultimately 503 valid subjects). To be considered valid, subjects had to be SVOD users, complete the entire questionnaire, be 16 years of age or older, and not make any errors in the three control questions designed to identify possible inattention or carelessness. Valid subjects were obtained after the application of several filters: of the 805 subjects who accessed the survey, 34 were not SVOD users; 66 did not complete the entire questionnaire; 5 were under 16 years of age; 119 missed a control question in the first third of the questionnaire; 29 missed another control question in the middle of the questionnaire; 45 missed the third control question in the last third of the questionnaire; and 4 specified an SVOD platform that in reality was not.

3.2. Variables

We specified five relatively abstract/complex variables as latent constructs and measured them through four items used in or adapted from previous studies—namely, Variety seeking [10,43], Social norms [44,45], Ethical disapproval [26,46], Household financial situation [47,48], and Trait reactance [49,50]. These variables' items (Tables 2 and 6) were measured on a 5-point Likert scale (from 1 = *completely disagree*, to 5 = *completely agree*).

We designed four alternative versions of the warning message, which consisted of three paragraphs (Appendix B). The first two paragraphs were common and stated that SVOD platforms did not allow subscription sharing with people in other households and thus had agreed to establish an additional user authentication system. The third paragraph specified one of the four authentication modes, which resulted from combining two alternative options: to whom the authentication code was addressed (subscription holder vs. profile user) and how often authentication was required (every month vs. every week). Perceived fairness was defined as the subjective evaluation of the additional authentication system and measured with four items rated on 5-point semantic differential scales, such as 1 = *inadequate* and 5 = *adequate* (Table 6).

Three variables were calculated from the information reported before receiving the warning: (a) No. of proprietary subscriptions used was obtained by counting the number of SVOD platforms that the respondent used through subscriptions from his/her household, either paying all or sharing the cost with another household; (b) No. of non-proprietary subscriptions used was determined by counting the number of SVOD platforms that the respondent used through subscriptions from other households, either sharing the cost or paying nothing; and (c) No. of illegal streaming sites used was calculated by adding up how many free sites were used by the respondent to watch shows/movies offered by paid platforms.

Change in No. of proprietary subscriptions was calculated as the difference between the number of proprietary subscriptions used after and before receiving the warning. Change in No. of non-proprietary subscriptions was calculated as the difference between the non-proprietary subscriptions used after and before receiving the warning.

3.3. Statistical Analyses

The baseline and change models were estimated using partial least squares structural equation modeling (PLS-SEM). Firstly, each latent variable was tested for (a) internal consistency reliability through its composite reliability value (CR), (b) convergent validity through its outer loadings and average variance extracted (AVE), and (c) discriminant validity through cross loading comparison and the Fornell-Larcker criterion. Secondly, the collinearity between the predictors was checked using variance inflation factor (VIF) values. Thirdly, the hypothesized relationships were examined by testing the significance of the path coefficients and measuring their magnitude through f^2 and q^2 values. We used generally recommended criteria [51] to perform PLS algorithm, bootstrapping, and blindfolding procedures (e.g., 300 maximum interactions and 5,000 bootstrap samples) and to evaluate results (rules of thumb for the above mentioned tests). PLS-SEM analyses were performed with *SmartPLS 4* [52].

Table 1. Sample distribution.

Variables	Categories	No. of subjects (N = 503)	Sample percentage
Gender	Males	219	43.5
	Females	284	56.5
Age	16–30	115	22.9
	31–40	127	25.2
	41–50	137	27.2
	51 or more	124	24.7
Education	Primary	54	10.7
	Secondary	191	38.0
	Tertiary	258	51.3
Warning version	First	126	25.0
	Second	127	25.2
	Third	126	25.0
	Fourth	124	24.7
Use of illegal streaming sites	Yes	126	25.0
	No	377	75.0

While the models were estimated on individuals (i.e., the 503 subjects), the analyses on platform demand changes were performed on platforms (i.e., the 1359 platforms used by the subjects). Ways of access to SVOD platforms were counted before and after receiving the new authentication system warning. We then performed several McNemar chi-square tests to evaluate the impact of this warning on the platform access ways.

Two-way ANOVA analyses were conducted to test whether alternative authentication modes affected the change in demand for proprietary and non-proprietary subscriptions.

The analyses mentioned in the last two paragraphs were performed with *SPSS for Windows* (version 26, IBM SPSS, Armonk, NY, USA, 2019).

The significance level was set at $p < 0.05$ for all the analyses.

4. Results

Table 1 shows the sample distribution by gender, age, education, warning version, and use of illegal streaming sites. The data used in this study are available in Authors [53].

4.1. Baseline Model

With regard to the latent variable measurement, the four latent variables can be considered (a) sufficiently internally consistent because their composite reliability values were higher than the recommended 0.7 threshold (Table 2); (b) sufficiently convergent because their outer loadings were above the cut-off value of 0.7 (Table 2); and (c) sufficiently distinct from other latent variables because their AVE square root values were higher than the latent variable's highest correlation with any other latent variable (Table 3) and because their outer loadings were above the cross loadings with other latent variables.

Table 2. Measurement of latent variables in the baseline model.

Latent variables	Items	Outer loadings
Variety seeking (AVE = 0.681; CR = 0.845)	I like to experience novelty and change in my daily routine	0.832
	I am continually seeking new ideas and experiences	0.872
	I like to continually change activities	0.806
	When things get boring, I like to find some new and unfamiliar experiences	0.789
Social norms (AVE = 0.774;	Many friends and relatives would disapprove if I used an SVOD platform without paying its full cost	0.908

CR = 0.902)	People important to me think it illicit to use an SVOD platform without paying its full cost	0.887
	Many close people recommend me not to use SVOD platforms if I don't pay all their costs	0.831
	The people I appreciate the most would never use SVOD platforms without paying all their costs	0.891
Ethical disapproval (AVE = 0.835; CR = 0.934)	Using an SVOD platform without paying its full cost goes against my principles	0.928
	Using an SVOD platform without paying its full cost is ethically unacceptable	0.941
	Using an SVOD platform without paying its full cost is a practice that should be prosecuted	0.905
	Using an SVOD platform without paying its full cost is a practice that one should feel guilty about	0.880
Household financial situation (AVE = 0.720; CR = 0.868)	At home we could handle a major unexpected expense	0.881
	At home we have money left over at the end of the month	0.889
	At home we can afford extra expenses	0.867
	At home we are optimistic about our financial future	0.750

Note: AVE = Average variance extracted; CR = Composite reliability.

With respect to the structural model assessment, the diagnostics of collinearity between Variety seeking, Ethical disapproval, and Household financial situation showed VIF values below the critical threshold of 5, indicating the lack of collinearity issues. Regarding the model's hypothesized relationships (Table 4), Variety seeking had positive effects on No. of proprietary subscriptions and No. of illegal streaming sites (with very small effect sizes in both relationships) but had no influence on No. of non-proprietary subscriptions. Social norms had a positive impact on Ethical disapproval with a very large effect size. In turn, Ethical disapproval had negative effects on No. of non-proprietary subscriptions (small effect size) and No. of illegal streaming sites (very small effect size) but had no influence on No. of proprietary subscriptions. Finally, Household financial situation had a small-sized positive impact on No. of proprietary subscriptions but did not produce the other hypothesized effects.

Table 3. Assessment of discriminant validity in the baseline model.

Latent variable	(1)	(2)	(3)	(4)
(1) Variety seeking	0.825			
(2) Social norms	0.254	0.880		
(3) Ethical disapproval	0.228	0.804	0.914	
(4) Household financial situation	0.256	0.178	0.154	0.848

Note: The square root of AVE values is shown on the diagonal; nondiagonal elements are the variable correlations.

4.2. Effects of Access Control Enforcement

Regarding the subscription demand changes, Table 5 shows the number of platforms used, by way of access, before and after receiving the new authentication system warning. A remarkable first finding is that subjects would stop using 152 platforms, representing 11.2% of the total in use. Another finding refers to the changes in the way of access to the platforms that would continue to be used: a reduction of 2.6% ($1 - 1027/1054$) in fully paid proprietary subscriptions, which is not a significant change according to McNemar's test ($X^2 = 3.735; p > 0.05$); a significant reduction of 38.0% in cost-sharing proprietary subscriptions ($X^2 = 24.174; p < 0.001$); a significant reduction of 26.6% in cost-sharing non-proprietary subscriptions ($X^2 = 4.040; p < 0.05$); and a significant reduction of 64.7% in unpaid non-proprietary subscriptions ($X^2 = 33.018; p < 0.001$).

Table 4. Evaluation of the baseline model hypotheses.

Hypothesized relationships	Path coeff.	t values	Sig.	f ²	q ²
H1a: Variety seeking → No. of proprietary subscriptions used	0.142	3.334	$p < 0.01$	0.020	0.016
H1b: Variety seeking → No. of non-proprietary subscriptions used	0.059	1.419	0.156	0.003	-0.001
H1c: Variety seeking → No. of illegal streaming sites used	0.130	2.920	$p < 0.01$	0.016	0.010
H2: Social norms → Ethical disapproval	0.804	43.231	$p < 0.001$	1.822	1.808
H3a: Ethical disapproval → No. of proprietary subscriptions used	0.036	0.825	0.410	0.001	-0.003
H3b: Ethical disapproval → No. of non-proprietary subscriptions used	-0.246	5.405	$p < 0.001$	0.061	0.028
H3c: Ethical disapproval → No. of illegal streaming sites used	-0.116	2.728	$p < 0.01$	0.013	0.002
H4a: Household financial situation → No. of proprietary subscriptions used	0.212	5.326	$p < 0.001$	0.046	0.041
H4b: Household financial situation → No. of non-proprietary subscriptions used	-0.065	1.353	0.176	0.004	-0.001
H4c: Household financial situation → No. of illegal streaming sites used	0.067	1.307	0.191	0.004	-0.001

A crucial finding for the SVOD industry is the effect of access control enforcement on the total demand for proprietary and non-proprietary subscriptions. On the one hand, the total number of proprietary subscriptions would have a reduction of 7.2% ($1 - 1125/1212$), which proved to be significant ($X^2 = 42.751$; $p < 0.001$). On the other hand, the total number of non-proprietary subscriptions would have a significant reduction of 44.2% ($X^2 = 29.898$; $p < 0.001$).

Concerning the effects of alternative authentication modes, the ANOVA of Change in No. of proprietary subscriptions showed that neither Subject of authentication ($F < 1$), nor Frequency of authentication ($F < 1$), nor the interaction of both factors ($F = 1.567$; $p > 0.05$) produced any significant difference on the dependent variable. Likewise, the ANOVA of Change in No. of non-proprietary subscriptions showed no significant difference caused by either Subject of authentication ($F < 1$), Frequency of authentication ($F = 1.911$; $p > 0.05$), or the interaction of both factors ($F < 1$).

Table 5. Number of platforms used, by way of access, before and after receiving the new authentication system warning.

Before the warning	After the warning				Platforms no longer used	Total
	(1)	(2)	(3)	(4)		
(1) Fully paid proprietary subscriptions	950	26	12	1	65	1054
(2) Cost-sharing proprietary subscriptions	50	56	22	1	29	158
(3) Cost-sharing non-proprietary subscriptions	13	10	19	4	33	79
(4) Unpaid non-proprietary subscriptions	14	6	5	18	25	68
Total	1027	98	58	24	152	1359

4.3. Change Model

Regarding the latent variable measurement (Table 6), the two items of Trait reactance with outer loadings below 0.7 were considered for removal but ultimately retained because their deletion did not lead to an increase in the composite reliability. With AVE values above the 0.5 threshold, Trait reactance and Perceived fairness showed sufficient convergent validity. Moreover, with composite reliability values above 0.7, both latent variables demonstrated acceptable internal consistency. Finally, the discriminant validity tests showed that Trait reactance and Perceived fairness capture phenomena that are clearly distinct from each other.

Table 6. Measurement of latent variables in the change model.

Latent variables	Items	Outer loadings
Trait reactance (AVE = 0.531; CR = 0.851)	I become angry when my freedom of choice is restricted	0.903
	I become frustrated when I am unable to make free and independent decisions	0.569
	I am content only when I am acting on my own free will	0.616
	I resist the attempts of others to influence me	0.777
Perceived fairness (AVE = 0.802; CR = 0.920)	For me, the new user authentication system is <i>inadequate</i> to <i>adequate</i>	0.889
	For me, the new user authentication system is <i>abusive</i> to <i>moderate</i>	0.898
	For me, the new user authentication system is <i>unjustifiable</i> to <i>justifiable</i>	0.892
	For me, the new user authentication system is <i>unbearable</i> to <i>bearable</i>	0.905

Note: AVE = Average variance extracted; CR = Composite reliability.

Concerning the proposed hypotheses (Table 7), Trait reactance had a negative impact on Perceived fairness with a rather small effect size. In turn, Perceived fairness had a small-sized positive effect on Change in No. of proprietary subscriptions and a rather small-sized negative effect on Change in No. of non-proprietary subscriptions.

Table 7. Evaluation of the change model hypotheses.

Hypothesized relationships	Path coeff.	t values	Sig.	f ²	q ²
H8: Trait reactance → Perceived fairness	-0.149	2.716	p < 0.01	0.023	0.015
H9a: Perceived fairness → Change in No. of proprietary subscriptions used	0.296	7.205	p < 0.001	0.096	0.003
H9b: Perceived fairness → Change in No. of non-proprietary subscriptions used	-0.141	2.957	p < 0.01	0.020	0.001

5. Discussion

The baseline model results confirmed many of the effects of the proposed predictors. Firstly, variety seeking had a significant modest-sized effect on the use of more proprietary subscriptions (H1a) and more illegal streaming sites (H1c), which is attributed to the wider range of shows and movies that variety seekers can enjoy. But unexpectedly variety seeking did not affect the use of more non-proprietary subscriptions (H1b), even though these also would allow for enjoying a greater variety of shows and movies. We tentatively conjecture that using a variety-seeking measure that is specific to entertainment activities, rather than the generic measure used here, could increase the effect sizes for H1a and H1c as well as provide support for H1b. Secondly, ethical disapproval of unauthorized SVOD use had the expected deterrent effects on demand for non-proprietary subscriptions (H3b) and illegal streaming sites (H3c) but not the expected stimulating effect on proprietary subscriptions (H3a). This may have occurred because proprietary subscriptions mix one ethically acceptable practice (the owner can pay the entire fee and use the account exclusively) with two ethically unacceptable ones (the owner can pay the entire fee and share the account with no financial compensation as well as pay only a part of the fee and share the account). Thirdly, household

financial situation only predicted the demand for proprietary subscriptions (H4a), confirming the intuition that the number of platforms contracted is directly conditioned by the perceived household welfare. However, the lack of significance for non-proprietary subscriptions (H4b) and illegal streaming sites (H4c) is counterintuitive because both forms of consumption may allow lower welfare households to view more film content. Again, we suggest that a more tailored measure (e.g., perceived power of increasing the budget for entertainment activities) could serve to both increase the effect size for H4a and provide support for H4b and H4c. Additionally, social norms had an oversized impact on ethical disapproval of unauthorized SVOD use (H2). A possible explanation for this remarkable effect size is that social norms may be less influential in an activity performed alone than in unauthorized SVOD use, in which one typically shares SVOD accounts with relatives/friends/colleagues, who help shape and maintain one's ethical evaluation of this activity.

Regarding the effects of the access control enforcement, users elicited a negative reaction to such a restriction and responded by reducing their demand for both proprietary and non-proprietary platforms (H5a and H5b confirmed). Importantly, the access control enforcement succeeded in almost halving the demand for non-proprietary subscriptions, although with no effect on platform revenues. But much more importantly, the access control enforcement collaterally led to a 7% reduction in the demand for proprietary subscriptions, which represents a noteworthy loss of platform revenues. Furthermore, neither the demand for proprietary nor non-proprietary subscriptions was affected by the alternative authentication modes (H6 and H7 unsupported), even though these were designed with different levels of difficulty for users. We think that such counterintuitive results can be explained by two factors. First, the new authentication system warning may have provoked a very strong counter-reaction because at the time of the survey no platform was using such a system and because it was announced that all platforms would be using the new system from then on. Second, the deep impression caused by the warning may have hindered users from examining the extent to which the new authentication system was going to complicate their access to the platforms.

Concerning the change model, the main finding is that perception of fairness of the access control enforcement produced an increase in proprietary subscriptions (H9a) and a reduction in non-proprietary subscriptions (H9b). This finding seems to contradict the previously noted reduction in both proprietary and non-proprietary subscriptions, but all observations have a coherent explanation: the analysis by platform reveals an overall reduction in demand in response to the access control enforcement, while the analysis by individual reveals that perceived fairness leads some users to act in the best interest of platforms by increasing proprietary subscriptions and reducing non-proprietary subscriptions. The overall reduction in platform demand occurs because the perception of fairness is generally low among users. There is a huge gap between the subjective perception of many individuals and the rational argumentation with which platforms justify their right to control user access to safeguard contractual terms. Another finding of the model helps understand why individuals perceive the fairness of the access control enforcement differently (H8 confirmed): individuals with higher trait reactance tend to develop more counterfactual reasoning that makes them perceive the platforms' additional control as less justifiable.

5.2. Managerial Implications

The growing rivalry in the SVOD market puts pressure on platforms to improve access control systems in the hope that a portion of unauthorized users will regularize their situation by becoming subscribers. The simulated access control enforcement is far from producing the increase in monetization desired by the platforms. An enforcement like this is very effective in causing a substantial reduction of unauthorized SVOD users, but collaterally it also causes a noteworthy reduction of proprietary subscriptions, with a corresponding reduction in platform revenues. Our study also reveals how the effectiveness of an additional access control could be improved. Firstly, platforms should understand that justifying the access control enforcement to users is more important than comparing the effectiveness of alternative authentication modes, which are otherwise not perceived as different when users generate strong reactions against additional control. Secondly, it is important to realize that users' perception of fairness depends not only on the strength of the

arguments provided by platforms but also on users' willingness to react in defense of their threatened freedom. In this sense, we suggest using arguments that reduce counterfactual reasoning (e.g., the new authentication system is the same used by digital banking platforms) and make some positively predisposing offer (e.g., make the access control enforcement coincide with the launch of popular titles or with some discount rewarding loyalty or encouraging subscription). Thirdly, platforms should take advantage of the important role played by social norms in discouraging unauthorized use of SVOD accounts. We recommend that platforms engage more intensively in campaigns to raise public awareness that unauthorized SVOD use harms copyright holders akin to piracy. When this awareness becomes more widespread, it will be easier for a party involved in account sharing to encourage self-regulation of such unauthorized practice.

5.1. Theoretical Implications

Film demand in SVOD platforms will likely be as heavily researched in the future as film demand in cinemas, video players, and TV networks has been in the past. We recommend including the predictors identified here in future models on demand for SVOD content on both platform subscriptions and illegal sites. The incorporation of such predictors could be justified by mere intuition, but the underlying rationale and empirical evidence presented here suggest a much stronger justification. Furthermore, the combination of reactance and fairness theories offers a promising conceptual framework for future models of how access control enforcement could achieve increased subscription revenues when such enforcement is perceived as sufficiently fair. We suggest that this conceptual framework could also be applied to other online subscription services, both for entertainment (music, games, books, etc.) and information (newspapers, magazines, courses, etc.). These services have important differences with respect to the SVOD service, but all face the challenge that access control enforcement can provoke negative reactions from users when they perceive it as unfair.

5.3. Limitations

Some limitations are related to the use of non-random and self-reported data. Firstly, the non-random recruitment of Cint's panelists does not guarantee an equal selection probability, so we do not know to what extent the sample used accurately represents SVOD users in Spain. Secondly, the self-reported data may contain inaccuracies/errors that respondents may have made intentionally/inadvertently but may also understate SVOD content unauthorized use because some panelists may have been sensitive to reporting such ethically questionable practice.

Other limitations come from the measurement of participants' response to the simulated access control enforcement. The simulated situation did not allow respondents to consider some factors that might be relevant in their real-world decisions—for example, users would have had more time to assess the new control system implications and might also have made their decisions with other involved parties, such as household members or non-cohabitants with whom accounts are shared. Furthermore, we only measured the immediate effects of alternative authentication modes, whose effects could differ after a period of time during which users become annoyed with or adapt to the complexity of authentication.

5.4. Future research directions

Further research is needed to extend and deepen this initial modelling of (a) the demand for SVOD content on proprietary platforms, non-proprietary platforms, and illegal streaming sites and (b) the change in demand for SVOD platforms due to a more rigorous user-authenticating system. As theoretical challenges, more robust models could be achieved by incorporating new effects (e.g., the impact of access control enforcement on the use of illegal streaming sites), by adding new variables (e.g., egocentrism and justice sensitivity as potential predictors of perceived fairness), and by adjusting the scales used (i.e., variety seeking and household financial situation). As practical challenges, it is important to investigate to what extent SVOD platforms can improve their

performance by redefining their priority (i.e., supporting the control decision rather than increasing control effectiveness), by preventing strong reactions against control enforcement (e.g., with arguments that reduce counterfactual reasoning and with offers that develop positive dispositions), and by promoting social awareness that unauthorized SVOD use is just another form of piracy. Furthermore, a more comprehensive and representative evidence of the SVOD market could be obtained by using real-world data. This type of data would greatly help address the challenge of understanding how to improve platforms' subscription monetization by identifying consumers' heterogeneous preferences for contract terms and by offering plans tailored to the most promising groups (e.g., more expensive basic fees and reduced fees for those who agree to receive advertising or set minimum stay periods).

6. Conclusions

This study's findings provide original insights into the demand for SVOD content. A set of factors (variety seeking, household financial situation, ethical evaluation, and social norms) help explain how consumers combine a greater or lesser number of proprietary subscriptions, non-proprietary subscriptions, and illegal streaming sites. An access control enforcement, supposedly implemented by the entire industry to monetize all subscription-using households, would have provoked a considerable reduction in subscription revenues. This would have occurred because consumers strongly reacted against the threat of losing the freedom they had previously enjoyed in accessing accounts. Under this strong repulsion, consumers did not give importance to the different degrees of complexity in the proposed authentication modes. The SVOD industry justified the access control enforcement through rational and objective arguments, but most subjects evaluated such a decision purely based on their own subjective perceptions. Although all this seems to paint a bleak picture, the latest findings open a window of hope for the platforms: proprietary subscriptions tend to increase and non-proprietary to decrease when consumers perceive the platforms have made a fair decision, a perception that is more likely among individuals with lower trait reactance. All these insights can help better understand consumers' reactions as well as plan some ways to improve their perceptions and ultimately increase their number of proprietary subscriptions. We hope that this initial study on SVOD content demand will stimulate future research, with a broader scope and a more sophisticated methodology, and that the results will be published for the benefit of the entire industry and the scientific community.

Appendix A. Suggested Use of SVOD Platforms and Illegal Streaming Sites

Twelve suggested SVOD platforms: Netflix, HBO Max, Amazon Prime Video, Filmin, Disney+, Flixolé, Apple TV, Rakuten TV, Starzplay, Mubi, Fubo TV, and Planet Horror.

Fourteen suggested illegal streaming sites: Plusdede, HDFull, Pelisplus, PeliculasFLV, Gnula, Cuevana, Pelisflix, Series24, Pelispedia, Repelis24, GoMovies, FMovies, 123Movies, and YesMovies.

Appendix B. Alternative Versions of the Warning

– All four versions began with the following two paragraphs –

Video-on-demand platforms stipulate that a subscription only covers people living in the household. Therefore, sharing the use of a subscription with people from other households is not allowed. But platforms note that their content is often consumed from devices and locations that do not match the subscribed households.

To alleviate this problem, all platforms have just agreed to establish a user authentication system, which will be applied when someone tries to access through an unknown device or an Internet connection not associated with the household.

– Version 1 ended with the following paragraph –

When this situation is detected, the user must be authenticated by a code sent to the subscription holder's mobile phone. The access will then be enabled for one week and can later be reinstated weekly with new authentication codes.

– Version 2 ended with the following paragraph –

When this situation is detected, the user must be authenticated by a code sent to the subscription holder's mobile phone. The access will then be enabled for one month and can later be reinstated monthly with new authentication codes.

– Version 3 ended with the following paragraph –

When this situation is detected, the user must be authenticated by a code sent to the mobile phone registered in the account profile from which access is attempted. The access will then be enabled for one week and can later be reinstated weekly with new authentication codes.

– Version 4 ended with the following paragraph –

When this situation is detected, the user must be authenticated by a code sent to the mobile phone registered in the account profile from which access is attempted. The access will then be enabled for one month and can later be reinstated monthly with new authentication codes.

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