Analysis of the factors that determine cinema attendance

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Abstract: New forms of consumption, including online streaming, have interfered with film exhibition, promoting important changes. These services need to generate significant traffic and a look for a wide range of home subscribers to provide them with an extensive catalogue of movies. The domestic confinement in almost all countries caused by COVID-19 has led the internet to break historical traffic records. Cinemas are no longer the only place where a film can be shown. The novelty of films is the main factor that convinces viewers to pay for a cinema ticket. The exhibitor must pursue excellence and offer a truly superior experience at a reasonable price, because of the limited budget for leisure activities. This research uses structural equation modelling (SEM) to carry out an empirical analysis on the results of a questionnaire with a focus on the factors influencing the preference for watching films at a cinema.

Keywords: cinema; online; streaming; viewers; exhibition; survey; preferences; attendance; display windows; structural equations.

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1 Introduction

Cinema is going through a difficult time. If you consider that watching a film on any medium is cinema, then cinema is more popular than ever, due to television and the rest of what are known as exhibition windows. Films have many other marketing possibilities. The distribution window system was implemented in the 1980s as a formula so that the same film did not compete against itself in different distribution channels. The distribution cycle of a film has some periods of exclusivity between the windows, that are getting shorter. Product performance continues with the sale and rental of films in other formats. Marshall et al. (2013) highlight the importance of the transformation in the film industry due to platform launches and shortening exhibition windows.

The abandonment of cinema does not imply in any case the absence of audiovisual consumption. What has changed is the system and the place of use. If the use of audiovisual products in other media is considered, global audiovisual consumption has increased, according to Deltell and García Fernández (2014). From this perspective, the health of cinema is excellent. However, if we refer exclusively to the shared experience in front of a big screen in a dark room, attendance has been decreasing gradually for decades, mainly since the introduction of television. Although the cinema display sector has been gradually adapting to digital and 3D technology, it is difficult to differentiate it from other exhibition windows. Since 2010, a new format for television and film consumption, cinema on demand, has been introduced.

Data on the number of viewers in Spain shows that in 2019 there were 104.88 million viewers, 98.90 in 2018, 99.80 in 2017 and 101.82 in 2016. These figures are far from those of 2008, with 107.8 million viewers (ICAA, 2019). Only 0.9% of the Spanish population goes to the cinema once a week (AIMC, 2019). The low level of attendance by person/year is the most worrying variable (García Santamaría and Maestro Espínola, 2015). Streaming services have defied any logical decision-making process followed by the production companies. Unlike what Hollywood studios do, digital streaming companies offer subscription packages (e.g., Netflix, Amazon Prime and Apple TV+) and movie deals (e.g., Amazon Video and Apple iTunes). The confinement in almost all countries caused by COVID-19 has motivated an accelerated growth in the number of subscribers to streaming services which has increased the number of transaction and subscription platforms, combined with the detriment of movie theatres that have been closed for a period of time. The behaviour of audiovisual spectators represent a radical change, they no longer have to go to a space (cinema) and join an anonymous and

unknown community to view a film but rather do so individually (Álvarez Monzoncillo and López Villanueva, 2015). We consider that it is important to analyse in this work the preference for watching a movie in a cinema and continue the research in the future by analysing the preference to watch streaming movies. In terms of numbers, logically there would be upward vertical integration of digital players and studios as both seek to increasingly expand their intellectual property portfolios.

The future of movie theatres is unknown. Some scientists (Hadida et al., 2020) point to changes in the industry using a different set of organisational practices and decision criteria in the development of film projects and in decision-making about distribution, while others predict the end of showrooms. We should remember that the bases of the film industry's business model are: production, distribution and exhibition. Production includes basically film making; distribution consists of wholesale of the film; finally, exhibition consists of retail sale of the final product. Film exhibition entrepreneurs cannot influence film production. However, they can help viewers enjoy films by offering the best quality service. As managers of service companies, entrepreneurs must pay sufficient attention to consumers (Bitner, 1992). Customer satisfaction and expectations of a company's offer must be achieved (Hasemark and Albinsson, 2004). If what the exhibitor offers is in line with the expectations of the client, the spectators will be satisfied (Gerpott et al., 2001). Customers can be offered a better image, better sound, a bigger screen, a more comfortable seat, a better service, a greater variety of films and better prices, among other factors.

Haywwod-Farmer (1988) highlights three attributes as essential in services: professional judgment, physical facilities and behavioural aspects. An appropriate balance must be maintained between the three. Torres (2010) proposed a scale to measure the quality of the service in cinemas. He concluded that service quality is a variable comprised of interrelated dimensions (latent variables), rather than just a multi-attribute. Loyalty is a direct result of the value perceived by the client and the quality of the obtained services (Abdel Fattah et al., 2016).

This paper is based on the hypothesis that service quality can reach a higher level if it responds to spectators' expectations. A good way to focus this is to obtain and analyse information from spectators to provide useful information for exhibition managers.

Faced with the predicted transformation, this study should measure and analyse the degree of satisfaction of spectators with movie theatres, and, which attributes stand out in their assessment. Depending on the result obtained, another study could compare their satisfaction with that obtained using digital platforms. To do this, we should determine:

H1 If people who go to the cinema consume other types of windows, and the possibility of moving from one window to another.

H2 If technology influences actions once a person has decided to go to the movies, for example buying tickets online instead of the traditional ticket purchase.

In Section 2, we present the research carried out on this subject. Section 3 justifies the suitability of using structural modelling equations for this analysis. Section 4 describes the bases of the casual analysis used to develop the model. Section 5 shows the results of developing the model, to explain the response variable 'cinema' (i.e., cinema attendance). Finally, Section 6 presents the conclusions and future research and Section 7 describes the study limitation and the direction for further study.

2 Literature review

Predicting a film's success has been viewed by the film industry as a 'wild guess' according to Litman and Ahn (1998), who focus on consumers and their behaviour. Viewers tend to talk about films with people of the same age and gender. In line with the arguments of Godes and Mayzlin (2004), the more heterogeneous the population, the greater the audience of consumers. From another perspective, authors such as Jones and Ritz (1991) analyse the forecast of demand in the distribution of films, considering the screening that is carried out. Stimpert et al. (2008) focus on investigating the success of movies and the factors that influence box office success. In his approach, Hand (2002) focuses on modelling to determine attendance prediction. Sawhney and Eliashberg (1996) analyse a model of cinema-going consumer behaviour, based on stages in the execution of this decision.

Companies tend to use services as a medium and products as tools that can provide entertaining experiences for consumers. To support them, high-quality cinema facilities, good films, and good services are needed (Pine and Gilmore, 1999; Lovelock, 1983). Other studies have been carried out by Neligan (2006) and O'Hagan and Neligan (2005). They are based on the degree of product differentiation from other cultural activities: opera, theatre and concerts. Other research studies have analysed the differences and behaviour of cinema consumers with respect to multi-screen cinemas (Collins et al., 2005; Kim and Lee, 2019). Similarly, Cho et al. (2019) focus on the effects of the attributes of auditorium quality, services, cleanliness, accessibility and bars in order to determine the selection of multiplex cinemas from the perspective of customer satisfaction and loyalty. The results were differentiated by gender. From the perspective of the economy, Eliashberg et al. (2006) show characteristic effects depending on film genre, promotion strategies, and word of mouth. This is frequently cited as the most important factor in determining the long-term success of the films (De Vany and Walls, 1997). In line with this, Marshall et al. (2013) show in their work the two most important variables that determine demand: spending on advertising and quality. They also highlight the importance of the transformation in the film industry due to platform launches and the shortening of windows.

Authors such as Rasouli et al. (2020) highlighted the effectiveness of advertising to provide quality of service. Yamamura (2008) studied the recovery of cinema attendance in Japan and stated that a strong social network contributed to an increase in cinema attendance.

Customer satisfaction is essential for the success of organisations. For this reason, specific techniques must be adopted. de Almeida and Pelissari (2019) considered that customer satisfaction is essential. They adopted the classic SERVQUAL model to evaluate customer expectations and perceptions. Sukwadi and Yang (2014) integrated the SERVQUAL model and the refined Kano's model in the SEM framework. They stated that this is a good tool to determine quality attributes and their priorities to make the best decisions and draw up the best strategies for quality service.

In the same line as our objectives, Habicht and Thallmaier (2017) used the structural modelling technique to investigate the value behavioural intention, and, if applicable, how value is created for the customer within the co-design. In a totally different context, on the value of social networks in fashion, the study carried out by Pihl and Sandström (2013) highlighted how the internet has caused the obsolescence of some businesses,

which have given way to other forms of communication through a process of creative destruction.

3 Research methodology

Consumer perceptions and other types of variables on a smaller scale are stressed in the results of the field work that was carried out. To determine the factors that influence the choice of cinema, variables have been included that measure the personal characteristics of viewers (such as their age and status); the proximity of the cinema to the viewer; and the services provided by the cinema, distinguishing between those that facilitate a choice (number of auditoria, type of auditoria, sound quality, services that support the choice (parking, public transport, etc.), without overlooking viewers' image or perceptions of these factors.

Structural equation modelling (SEM) is a powerful tool whose main objective is to explain the pattern of a series of simultaneously interrelated dependency relationships between a set of latent (unobserved) constructs, each measured by one or more manifest (observed) variables. Measured (observed) variables in SEM have an infinite number of values (Reisinger and Turner, 1998). Reisinger and Turner (1999) and Nunkoo and Ramkissoon (2012) used SEM to determine unobserved variables (motivation, satisfaction and perception) in tourism. In other words, each step carried out with the analysis is based on theoretical reasoning. Consequently, theoretical models can be evaluated. These are fundamentally models that reflect the study of linear causal relationships in non-experimental data (Kerlinger and Lee, 2000). These models help select causal hypotheses that are relevant, as they never test causality. Causal models are likely to be statistically rejected if they contradict the data.

In this study, we chose to fit the models using linear structural relationships (LISREL) methodology. This software was originally introduced by Jõreskog and van Thillo (1972) for the analysis of covariance structure. This multivariate technique combines factor analysis modelling from psychometric theory and SEM associated with econometrics. It can be used to understand and justify causality in situations that cannot be reproduced experimentally. The software implemented in the AMOS program v.19.0.0 allows the model to be specified, its coefficients to be estimated, and a graphical representation to be obtained. All the adjusted models are interpreted based on standardised coefficients, since they allow comparisons. Missing data were processed using multivariate imputation by chained equations (MICE) from the statistical software R. The rest of the variables in the database were used as predictors of the missing data.

3.1 Causal analysis

3.1.1 Definition of blocks

This model specifies the relationships that are expected to be found between the variables (correlations, direct effects, indirect effects and loops). Each parameter must be correctly identified from the information in the covariance variance matrix. Prior to the analysis, a multiple imputation (m = 5) of values was performed, based on chained equations with the MICE function. Among all the surveys there were a total of 356 missing items of data. The modal profile of the respondent was a male (n = 379; 56%), 45 to 54 years old

(n = 158; 24%), a self-employed worker (n = 313; 47%) with university studies (n = 431; 64%) who goes to the cinema 5 to 6 times a year (n = 167; 25%). There were 356 missing items of data. This represents an average of 8.1 missing items per variable (1.2%), which were distributed among 160 individuals (23.8% of the sample). After this preliminary analysis on missing data, the blocks with the set of variables could be determined (Table 1).

Table 1 Blocks of the selected variables after imputation of missing

Blocks	*Set of variables*
B2	Local conditions
B3	Personal preferences
B4	Ticket purchase
B5	Travelling time
B7	Information
B8	Other windows

Figure 1 Bar charts of the items grouped according to the initial blocks of the survey (see online version for colours)

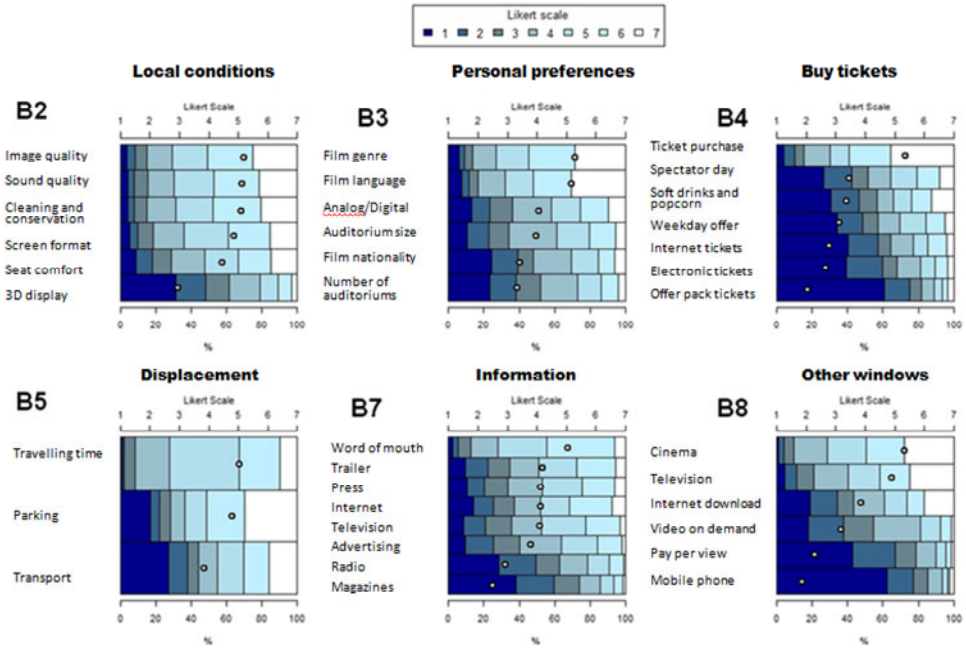


Figure 1 is the bar charts of the items grouped according to the initial blocks of the survey. The bars represent the cumulative percentage of responses in each category (lower scale). The points indicate the average score for each item (upper scale). The items in each graph (block) are ordered from highest to lowest.

Detailed descriptive statistics were analysed for each item: the number of responses (N), the average, the standard deviation and the percentage for each category. The following were notable:

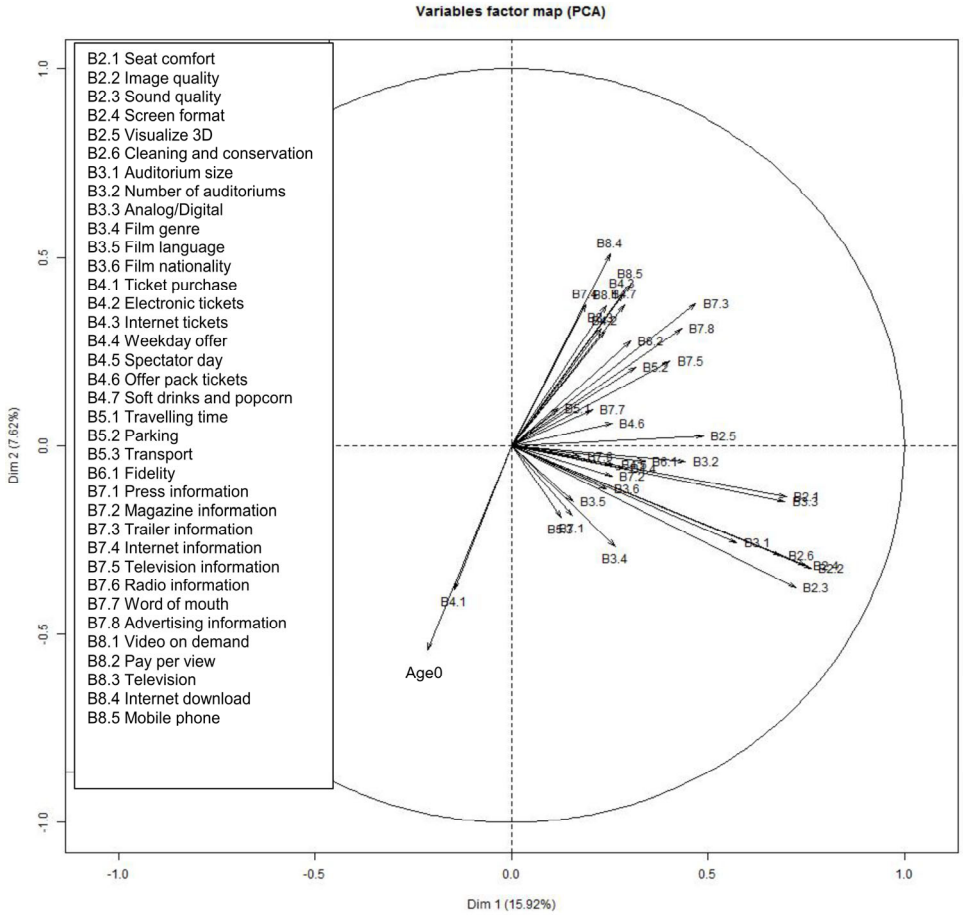
- B2: local conditions. The respondents gave fundamental importance to the quality of the image (mean = 5.18), the sound (5.11) and the cleaning/maintenance of the premises (5.08). In contrast, a 3D display was not valued (2.95).
- B3: personal preferences. The genre and language of the film were considered relevant (5.28 and 5.16). The film nationality was less important (3.4). Regarding auditorium preferences, the average values ranged between 3.32 and 3.98.
- B4: ticket purchases. Respondents mostly bought tickets directly at the box office (5.34) and made little use of offers (averages from 2.04 to 3.45). The purchase of soft drinks and popcorn had an average rating of 3.37.
- B5: travelling time. Respondents mostly have the closest cinema between 10 and 20 minutes from their home (39.1%). It matters if the premises have parking (4.78), but the ability to arrive by public transport was not as important (3.81).
- B6: fidelity. The respondents rated their fidelity to their preferred cinema with an average of 4.64.
- B7: information. The main source of information when choosing a film is word of mouth (5.02). Specialised magazines were not consulted to a great extent (2.51).
- B8: other windows. The two preferred ways of viewing a film are the cinema (5.3) – not shown – and free television (4.89). The least used are pay per view (2.28) and mobile phone (1.87).

3.2 Bivariate analysis

A bivariate analysis was carried out with the item ‘age’. In an exploratory way, the correlations (Pearson’s coefficients) of all the variables with a response on the Likert scale and age were calculated. To determine the number of significant dimensions, a Scree plot (a sedimentation graph used for the analysis of principal components) was drawn up, in which the variability explained by each axis from largest to smallest is represented. The existence of up to seven significant components was determined.

In a principal component analysis (PCA), the aim is to redefine the axes that represent the variables in usually two new axes called factors that retain most of the variability of the initial variables. These axes are a linear combination of the initial axes and can be interpreted. In this case, considering the variables with which they are correlated (the closest vectors), the first factor represents something like ‘the local conditions’ (valued to the right and not valued to the left). The second factor represents something like ‘how to buy tickets’ (tops represents electronic or online purchases and bottom shows box office purchases). For example, since age clearly points down and slightly to the left, it can be deduced that older people are very likely to buy tickets at the box office and do not give as much importance to the conditions of the premises as young people (Figure 2).

Figure 2 Representation of the questionnaire variables in the first two components of the CPA



To minimise the number of variables that contain high correlations in each factor, the varimax orthogonal rotation method was used. It was applied to the seven significant components found according to the Scree plot. Figure 3 represents graphically the most important two axes after applying the varimax rotation. It was confirmed that there is a first axis basically defined by the conditions of the premises and a second axis by the choice of information system. Table 2 shows the correlations between variables and axes after varimax rotation for the seven significant dimensions (dim. 1, dim. 2, dim. 3, dim. 4, dim. 5, dim. 6 and dim. 7).

Figure 3 Graphic representation of the CPA of the first two dimensions after the varimax rotation

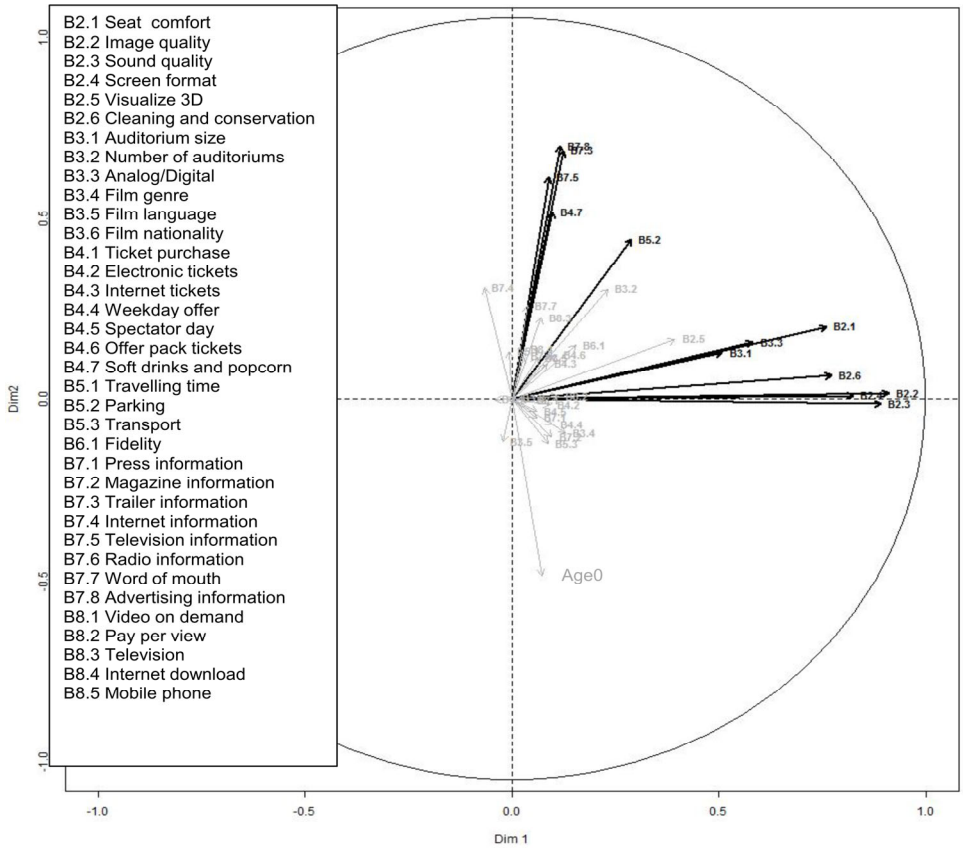


Table 2 Matrix of correlations between variables and the first seven axes after varimax rotation for |r| > 0.1

		Dim. 1	*Dim. 2*	*Dim. 3*	*Dim. 4*	*Dim. 5*	*Dim. 6*	*Dim. 7*
B2	Seat comfort	0.76	0.20	–0.12				
B2	Image quality	0.91						
B2	Sound quality	0.89				0.11		
B2	Screen format	0.82			0.12			0.13
B2	3D display	0.39	0.17	–0.15		–0.13	0.13	–0.26
B2	Cleaning and conservation	0.77				0.11		–0.12
B3	Auditorium size	0.51	0.13					–0.43
B3	Number of auditoriums	0.23	0.30			–0.12		–0.57
B3	Analogue/digital	0.58	0.16		0.21			–0.38
B3	Film genre	0.13				0.20		–0.55
B3	Film language		–0.13			0.13		–0.57
B3	Film nationality					0.17		–0.63

Table 2 Matrix of correlations between variables and the first seven axes after varimax rotation for |r| > 0.1 (continued)

		Dim. 1	*Dim. 2*	*Dim. 3*	*Dim. 4*	*Dim. 5*	*Dim. 6*	*Dim. 7*
B4	Ticket purchase			0.89				
B4	Electronic tickets			–0.86				
B4	Internet tickets			–0.88				
B4	Weekday offer				0.83	0.10		
B4	Spectator day			0.13	0.85			–0.12
B4	Pack tickets offer	0.11	0.12		0.55			
B4	Soft drinks and popcorn		0.52		–0.11	–0.20	0.17	
B5	Travelling time		0.13					–0.20
B5	Parking	0.29	0.44	–0.17	–0.15			0.18
B5	Transport		–0.12	0.24	0.22	0.28		
B6	Fidelity	0.15	0.15		0.22			–0.40
B7	Press information				–0.15	0.64		–0.18
B7	Magazines information		–0.10	–0.12	0.22	0.41		–0.20
B7	Trailer information	0.12	0.69		0.20		0.14	
B7	Internet information		0.31	–0.15	0.30		0.18	
B7	Television information		0.61			0.43		–0.13
B7	Radio information		0.12			0.65		
B7	Word of mouth		0.26			0.47		
B7	Advertising information	0.12	0.70			0.25		
B8	Video on demand						0.70	
P8	Pay per view	0.11		–0.15			0.53	–0.19
P8	Television		0.23	0.13			0.49	
B8	Internet download		0.14				0.76	
B8	Mobile phone		0.12	–0.11			0.65	
Age			–0.48		–0.37	0.29	–0.35	

3.3 Predictive factors of frequency of attendance and preference for the window 'cinema auditorium'

According to the varimax rotation, a possible grouping is that shown in Table 3. Items like soft drinks and popcorn (B4) were not considered because they have a very low coefficient (–0.11), TV in B7 was placed in dim. 2, which is where it is best represented. The number of auditoria was not in B3 because it does not fit with the theme of the other items that are associated with the content of the film (and not the auditoria). It was excluded for logical, non-statistical reasons. The factors that were obtained reflect clear, identifiable dimensions.

Table 3 Grouping of the questionnaire items according to their correlation with each of the dimensions in the PCA varimax rotation

Dim 1. Local quality		*Dim 2. Modern information*	
B2 Image quality	0.91	B7 Advertising information	0.70
B2 Sound quality	0.89	B7 Trailer information	0.69
B2 Screen format	0.82	B7 Television information	0.61
B2 Cleaning and conservation	0.77	B7 Internet information	0.31
B2 Seat comfort	0.76		
Dim 3. Ticket purchase		*Dim 4. Offers*	
B4 Ticket purchase	0.89	B4 Day viewer offer	0.85
B4 Internet tickets	_0.88	B4 Weekday offer	0.83
B4 Electronic tickets	_0.86	B4 Offer pack tickets	0.55
Dim 5. Classic information		*Dim 6. Windows preferences*	
B7 Radio information	0.65	B8 Download internet	0.76
B7 Press information	0.64	B8 Video on demand	0.70
B7 Word of mouth	0.47	B8 Mobile phone	0.65
B7 Magazine information	0.41	B8 Pay per view	0.53
		B8 Television	0.49
Dim7. 'Film' to 'Film'			
B3. Movie nationality	_0.63		
B3 Film language	_0.57		
B3 Film genre	_0.55		

Information from the internet has been included in dim. 2 (modern information) due to its relationship with the subject matter, even though it has a low correlation. Word-of-mouth information had a low correlation with classic information. The following missing items in the dimensions were not included due to low correlation and/or not having any relation to the theme of the dimension: B2 – 3D display, dim. 1 (0.39); B3 – auditorium size, dim. 1 (0.51); B3 – number of auditoria, dim. 7 (–0.57); B3 – analogue/digital, dim. 1 (0.58); B4 – soft drinks and popcorn, dim. 2 (0.52); B5 – travel time, dim. 7 (–0.20); B5 – parking, dim. 2 (0.44); B5 – public transport, dim. 5 (0.28); B6 – fidelity, dim. 7 (–0.40). It was proposed that this should be included in the dimension of preferences-windows, if it has a high correlation. This was not the case, as the correlation was lower than 0.10. Age item, dim. 2 (–0.48).

4 Development of the model based on SEM

We present a model of structural equations to discern influencing factors in the response variables of the questionnaire preference for watching films at a cinema (hereinafter referred to as cinema). The influencing factors that were statistically significant were: older people prefer cinemas and frequent them more often. The greater the value given to auditorium quality, the greater the preference for the cinema and the greater the attendance.

4.1 Variables involved in the models

Responses in the model were chosen as variables measured on a scale of 1 to 7: assessment of the preference for viewing a film in a cinema, where 1 means totally against and 7 totally in favour; frequency of attendance of a cinema where 1 represents never or almost never and 7 two or more times per week. This scale was inverted with respect to the original survey scale to be consistent with the other response variable. High scores reflected a greater preference for cinema in both cases. At first, 'fidelity to a specific cinema' was considered a response variable, although this option was later ruled out. It was also introduced as a predictor variable in the model, but it was not included as it was too closely related to the responses. The grouping of the variables in the model was carried out based on the results of a PCA.

4.2 Latent formative and reflective variables

Different models were adjusted in this study depending on whether the latent variables were considered reflective or formative. Reflective implies that there is an unobservable entity (the latent variable) that is measured through various observable variables. The latent variable causes the observable variables. Using the example of the model, the concept of auditorium quality is associated with more or less quality of image, sound, etc. It was assumed that these variables are measuring the same concept, which is the overall quality of the room. Formative is more like a classical regression as observable predictor variables cause or help predict an unobservable latent variable. A person can choose to watch television free and/or watch it in payment mode, but both variables are related to a latent variable that we call window.

All the latent variables in the model were considered reflective, with the exception of the window, which was considered formative. The validity of the results underlies two premises:

- The independence of the data. In other words, the responses of one survey are not conditioned by the responses of another survey.
- The exogenous variables must have a multivariate normal distribution. Although this is not totally true, since the variables are measured on a Likert scale, this can be assumed asymptotically due to the central limit theorem, because the sample is so large.

4.3 Selection of models

Before the final model was obtained, several models were adjusted in which there were modifications when the response variables were considered jointly or separately and if some variables were considered to be formative or reflective. The difference is explained below. All 40 variables were included in the initial model and finally four were deleted: loyalty to a specific auditorium; information obtained through the internet; word of mouth information and offers through a ticket pack.

The criteria that led us to the final model were above all interpretability and parsimony. Some of the parsimony indices that are most commonly used in estimating structural equation models, according to Maruyama (1997), are: the parsimony goodness-of-fit index (PGFI), which consists of adjusting the GFI based on the

parsimony of the estimated model; parsimony normed fit index (PNFI), which is similar to the NFI but considers the degrees of freedom used to reach the level of fit; Akaike information criterion (AIC), to compare models that have a different number of latent variables; and the consistent AIC (CAIC), based on a transformation of AIC.

4.4 Parsimony and model fit

The term parsimony in statistics is used to denote the number of parameters that are estimated in a model and as a selection criterion between alternative models, i.e., related to the level of adjustment for each coefficient or estimated parameters. It goes against the quality of the fit: the more parameters that are estimated in a model, the better the fit that will be achieved, even though the model is becoming less parsimonious.

In the ideal case, a balance should be found between parsimony and quality of the fit. This coefficient ranges from 0 (completely saturated or non-parsimonious model) to 1 (completely independent or parsimonious model). There are various measures for the quality of the fit. In this case, the chi-square χ^2 statistic was used. This statistic measures the discordance between the observed covariance matrices (O) and those that are estimated (E) by the model. Ideally, to achieve a good fit, these differences should be small and, consequently, the statistic should be non-significant (p-value < 0.05). However, for large sample sizes, it is virtually impossible to achieve a good fit based on this statistic (Browne and Mels, 1992). In this case, parsimony was weighted more than the adjustment.

4.5 Predictive capacity of the model

The predictive capacity of the model is measured through the coefficient R^2. In the classical linear model, it is the quotient between the variability explained by the model and the total (therefore, if it is 1, all the variability is explained). In this case, it is not a classical linear model; it is a pseudo-R^2, but its interpretation is the same: it quantifies the amount of information provided by the predictive variables on the preference response to going to the cinema.

In the case of reflective variables, for the latent variable or construct to be well-defined, most of the weights of the observable variables that make it up should be above 0.70.

5 Model results for the response variable ‘cinema’

The procedure that was used for its graphic representation [Figures 4(a) and 4(b)] was based on:

1 Using the PCA results to define the latent variables. Initially, all the variables were formative and were included in the model.

2 Eliminating from the model variables whose interpretation was strongly linked to the response (‘fidelity’ was eliminated).

3 If any weights in any latent variable were clearly less than 0.7, the corresponding observable variable was eliminated.

4 If all the weights in some latent variable were less than 0.7, then the suitability of passing this variable from formative to reflective was studied.

5 A variable was kept as formative if the following requirements were met: it showed a clear one-dimensionality in the PCA, the Dillon-Goldstein coefficient or the Cronbach's alpha coefficient was higher than 0.7, based on the research carried out on the subject, the nature of the variable was considered to be more formative than reflective.

The same graph shows the standardised coefficients of the model with the response variable cinema and the latent reflective variables. For a clear understanding, the graph has been divided into two halves [Figures 4(a) and 4(b)], sharing the response variable 'cinema'.

Parsimony and model fit, the number of estimated parameters (weights and variances) was 75, and the parsimony ratio was 0.93. Given that d is the number of degrees of freedom in the fitted model, i is one of the parameters and d_i is the degree of freedom of the null or independent model, the parsimony coefficient formula (PRATIO) is defined as:

$$PRATIO = \frac{d}{d_i} \tag{1}$$

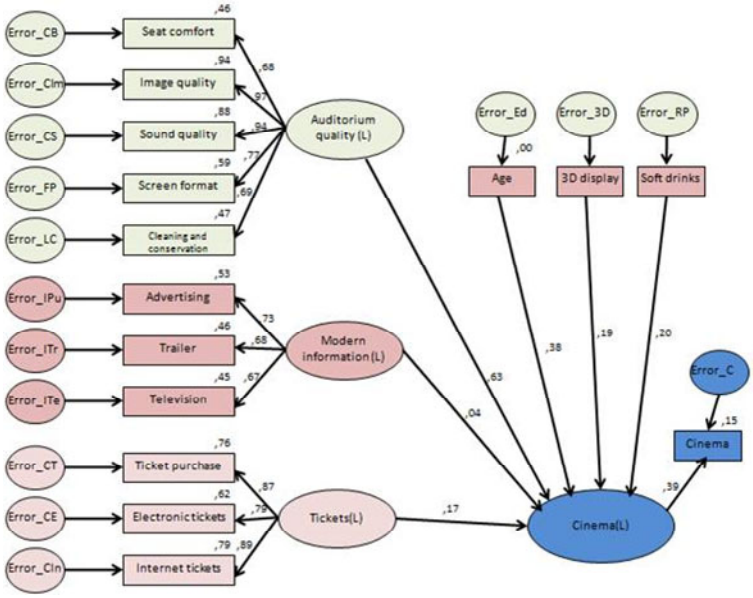
χ^2 = 3,343.442, the χ^2 statistic measures the discordance between the observed and expected covariance matrices according to the estimated model. Ideally, this statistic should be non-significant (p-value < 0.05) to define a good fit. The degrees of freedom, used in many model fitting measures, are 555, the number of parameters to estimate minus the number of known parameters. The P-value is nearly 0. As mentioned above, in large samples it is very difficult to find a good fit.

The predictive capacity of the model explains 15% of the answer as $R^2 = 0.15$. A total of 85% of the remaining variability would be explained by factors that are not considered in the model or by random factors. This value is relatively low. However, the objective of the study is not predictive but etiological, that is, the aim is to explain the influence of various items on the response variable. Table 4 shows the non-standardised weights of the defined model.

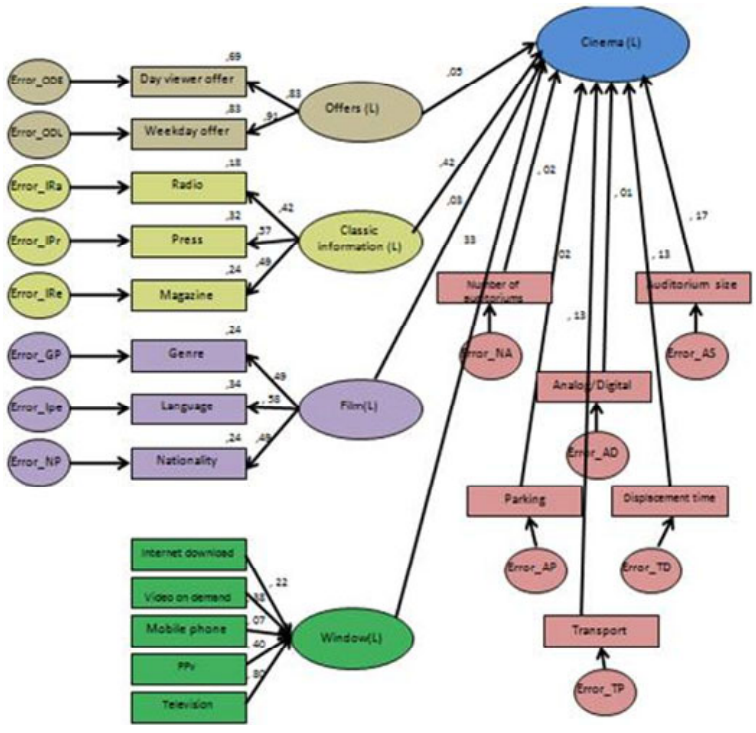
As an example, the interpretation of row 6 [cinema (L) ← auditorium quality (L)] is detailed. Point estimate (estimate): when the variable auditorium quality (L) is increased by one unit, the variable cinema (L) is increased by 0.289 units. Standard error (SE): 0.044. Statistical (CR) and p-value: as the statistic is much higher than 2 and the p-value is practically nil, we can affirm that the influence of the variable auditorium quality on cinema is statistically significant.

The estimate gives the increase in standard deviations of the response, the variable that receives the vector, as a function of the explanatory variable (origin of the vector). Standardised weights have the advantage that they are all comparable to each other.

Figure 4 (a) Standardised coefficients of the model with the cinema response variable and reflective latent variables (I) (b) Standardised coefficients of the model with the cinema response variable and reflective latent variables (II) (see online version for colours)



(a)



(b)

Table 4 Non-standardised weights of the relationships between variables

			Estimate	*SE*	*CR*	*P*
Window (L)	←	Download internet	1			
Window (L)	←	Video on demand	2.290	3.303	0.695	0.487
Window (L)	←	Mobile phone	–0.463	1.904	–0.243	0.808
Window (L)	←	Pay per view	–2.513	3.556	–0.707	0.48
Window (L)	←	Television	4.285	5.507	0.778	0.437
Cinema (L)	←	Auditorium quality (L)	0.289	0.044	6.5	***
Cinema (L)	←	Tickets	0.062	0.036	1.742	0.081
Cinema (L)	←	Age	0.142	0.034	4.219	***
Cinema (L)	←	Modern information	–0.020	0.052	–0.377	0.706
Cinema (L)	←	Offers (L)	0.016	0.032	0.492	0.622
Cinema (L)	←	Film (L)	0.019	0.085	0.222	0.824
Cinema (L)	←	Window (L)	–0.020	0.025	–0.808	0.419
Cinema (L)	←	Classic information (L)	0.331	0.111	2.987	0.003
Cinema (L)	←	3D	–0.062	0.029	–2.136	0.033
Cinema (L)	←	Soft drinks	0.051	0.024	2.147	0.032
Cinema (L)	←	Parking	–0.006	0.024	–0.252	0.801
Cinema (L)	←	Transport	0.034	0.023	1.464	0.143
Cinema (L)	←	Auditorium size	–0.006	0.031	–1.852	0.064
Cinema (L)	←	Number of auditoriums	0.006	0.029	0.211	0.833
Cinema (L)	←	Analogue/digital	0.002	0.028	0.075	0.94
Cinema (L)	←	Displacement time	–0.063	0.044	–1.409	0.159
Image quality	←	Auditorium quality (L)	1.286	0.057	22.469	***
Sound quality	←	Auditorium quality (L)	1.221	0.055	22.04	***
Screen format	←	Auditorium quality (L)	1	0.054	18.473	***
Ticket purchase	←	Tickets (L)	1			
Electronic tickets	←	Tickets (L)	–0.927	0.039	–23.875	***
Internet tickets	←	Tickets (L)	–1.128	0.042	–26.781	***
Seat comfort	←	Auditorium quality (L)	1			
Cleaning and conservation	←	Auditorium quality (L)	0.89	0.053	16.725	***
Cinema	←	Cinema (L)	1			
Genre	←	Film (L)	1			
Language	←	Film (L)	1.269	0.224	5.656	***
Nationality	←	Film (L)	1.11	0.184	6.031	***
Advertising	←	Modern information (L)	1			
Trailer	←	Modern information (L)	1.023	0.085	12.097	***
Television	←	Modern information (L)	0.94	0.078	12.084	***
Day viewer offer	←	Offers (L)	1			
Weekday offer	←	Offers (L)	1.071	0.093	11.571	***
Radio	←	Classic information (L)	1			
Press	←	Classic information (L)	1.355	0.263	5.146	***
Magazine	←	Classic information (L)	1.1	0.203	5.427	***

Regarding the response variable cinema (Table 5), the non-standardised weights are like the coefficients in a linear regression. Directly this would be the value by which we would multiply the variable to obtain the answer. The non-standardised weights are not comparable to each other. When standardised, the weights of the variables are comparable since they represent the change in the response (measured in standard deviations). For instance, the first coefficient in Table 5 shows that an increase of one standard deviation in the auditorium quality variable translates into an increase of 0.63 standard deviations in the cinema variable.

Table 5 Standardised weights of the relationships with the response variable cinema ordered from highest to lowest according to the point estimates of the weights (estimate)

			Estimate
Cinema (L)	←	Auditorium quality (L)	0.63
Cinema (L)	←	Classic information (L)	0.42
Cinema (L)	←	Age	0.39
Cinema (L)	←	Soft drinks	0.19
Cinema (L)	←	Tickets (L)	0.17
Cinema (L)	←	Transport	0.14
Cinema (L)	←	Offers (L)	0.05
Cinema (L)	←	Film (L)	0.03
Cinema (L)	←	Number of auditoriums	0.02
Cinema (L)	←	Analogue/digital	0.01
Cinema (L)	←	Parking	–0.02
Cinema (L)	←	Modern information (L)	–0.03
Cinema (L)	←	Displacement time	–0.13
Cinema (L)	←	Auditorium size	–0.17
Cinema (L)	←	Visualise 3D	–0.19
Cinema (L)	←	Window (L)	–0.33

Table 6 Standardised weights for the rest of the variable relationships ordered from highest to lowest according to the point estimates of the weights

			Estimate
Image quality	←	Auditorium quality (L)	0.97
Sound quality	←	Auditorium quality (L)	0.94
Weekday offer	←	Offers(L)	0.91
Ticket purchase	←	Tickets (L)	0.87
Day viewer offer	←	Offers (L)	0.83
Window (L)	←	Television	0.81
Screen format	←	Auditorium quality (L)	0.77
Advertising	←	Modern information (L)	0.73
Cleaning and conservation	←	Auditorium quality (L)	0.68
Trailer	←	Modern information (L)	0.68
Seat comfort	←	Auditorium quality (L)	0.68

Table 6 Standardised weights for the rest of the variable relationships ordered from highest to lowest according to the point estimates of the weights (continued)

			Estimate
Television	←	Modern information (L)	0.67
Language	←	Film (L)	0.58
Press	←	Classic information (L)	0.57
Genre	←	Film (L)	0.50
Nationality	←	Film (L)	0.49
Magazine	←	Classic information (L)	0.49
Radio	←	Classic information (L)	0.42
Cinema	←	Cinema (L)	0.39
Window (L)	←	Video on demand	0.38
Window (L)	←	Internet download	0.21
Window (L)	←	Mobile phone	–0.06
Window (L)	←	PPV	–0.39
Electronic tickets	←	Tickets (L)	–0.79
Internet tickets	←	Tickets (L)	–0.89

Similarly, Table 6 shows standardised weights related to the rest of the variable relationships in decreasing order, according to the point estimates of the weights. In the interpretation, the first coefficient for example reveals that an increase of one standard deviation in the auditorium quality variable translates into an increase of 0.97 standard deviations in the image quality variable.

5.1 Overall interpretation of the model

A well-defined construct is understood to be one that is comprised of observable variables that are highly correlated with the latent variable they form. It can be determined by the standardised weights obtained, most of which were greater than 0.7: auditorium quality (0.68–0.94), modern information (0.67–0.94), entries (0.79–0.89) and offers (0.83–0.91). Two other constructs were not as well-defined (weights less than 0.7): classical information (0.42–0.57) and films (0.49–0.58). These two variables have remained reflective because they showed clear one-dimensionality in the previously performed ACP and had Dillon-Goldstein coefficients of 0.75 and 0.76, respectively (which are relatively high).

Furthermore, in the case of classical information, the variable remained formative, because modern information was also formative. When the film variable is set as reflective, the language coefficient has a sign opposite to that of gender and nationality, which makes interpretation difficult. The window variable was established as formative, as the observable ones are those that cause the latent variable.

6 Conclusions and discussion

Once the empirical analysis of the questionnaire had been carried out, factors were considered that influence the variable response: cinema. An analysis of this response revealed the following factors in order of preference. Viewers who prefer to watch a film at a cinema compared to other windows give great importance to auditorium quality, which includes the variables of image, sound and degree of comfort. It was determined that the oldest people who gather information through the classic media (press, television and radio) show a greater preference for watching films at cinemas. To interpret this, it should be considered that in a cross-sectional study it is impossible to distinguish whether people as they get older like films more or if those born at a certain time have a greater predilection for films (while later generations prefer other windows). As the potential share of cinema spectators are those who obtain information through classic media (radio, press and magazines), marketing should be focused on these media.

This public, who want to watch a film at a cinema, also shows interest in buying soft drinks and popcorn and mainly buys tickets at the box office. People with a preference for buying tickets via internet or electronic sales do not choose cinema as the preferred window to watch films.

These spectators usually purchase their tickets in the box office. Most of the spectators prefer 2D films in the cinema and are not as interested in 3D films. People who prefer to watch a film at a cinema rather than on other exhibition windows are not concerned about the size of auditoria.

Finally, the model can be used to improve the satisfaction of customers and increase attendance. From similar studies, reports on process management could be generated which would help to improve the identified aspects if shortfalls are present, to offer a good service, increase loyalty and attract new customers. Efforts to improve should be focused on the key aspects detected in this type of study.

7 Study limitation and direction for further study

This research contains some limitations that suggest different ways of continuing. Only the perception of consumers was quantified with the cinema. Therefore, the perception of consumers with other windows should be quantified. As the business evolves due to the change in consumer habits, several future studies could be considered. In addition, if we want to keep the cinema as the first window, additional studies could be carried out to continue investigating what would be the ideal design of a room, so that viewers have total immersion in the film. In this sense, for a more rigorous confirmation, a layout problem could be solved through a mathematical model with some adapted constraints.

Another type of studies should also be developed to determine the evolution and satisfaction of viewers with streaming and its comparison with cinemas, which could lead to a radical redefinition of the current film scene. Every day, we receive information about how the income of studios or standard distribution is affected. Large distributors make strategic moves and compete with the business models of broadcasting services. The degree of interference of digital platforms in the current model and its influence on the loss of distributors competitiveness and a new set of organisational practices.

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