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Channel preferences and attitudes of domestic buyers in purchase decision processes of high-value electronic devices

Krisztina Taralik, Tamás Kozák, Zsolt Molnár

ABSTRACT

Objective: The objective of the article is to examine how respondents' technological readiness (as an individual factor besides demographic characteristics) influences channel preference (in-store, online big- and small-screen at different stages of the purchasing decision process for high-value electronic devices (products).

Research Design & Methods: The research encompassed data collected by a quantitative online survey of 415 respondents in Hungary. To identify homogenous groups in the sample, we used cluster analysis based on factors we determined among the technology-readiness variables.

Findings: We identified the technological readiness index 2.0 (TRI) segments in our sample and our findings confirmed that the perceived technological readiness has a significant influence on customers' channel choice.

Implications & Recommendations: Customer experience (CX) is far more than satisfaction with the product; it is influenced by the total purchasing decision process starting at the need recognition and ending at the post-purchasing stage. The difficulties and uncertainties in any stage of the decision-making process result in anxiety and reduce the CX. The uncertainty can arise from factors related to the product, individual, or channel.

Contribution & Value Added: Although the sample is not representative, it provides insight into how Hungarian respondents can be segmented based on technological readiness and how this affects their channel preferences during the customer journey through purchase decisions regarding electronic devices.

Article type: research article

Keywords: technological readiness; omnichannel; customer experience; pattern of channel usage; perceived control over the purchasing process; TRI

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INTRODUCTION

Because of the wide range of products and services offering similar attributes, the limited amount of time, information and money, and the customers' desire to choose the best possible alternatives, the purchasing process requires a certain degree of physical and mental effort.

Consumers' perceived value of the purchasing experience is far more than the satisfaction with the product. It is influenced by the total purchasing decision process starting at the need recognition and ending at the post-purchasing stage. The difficulties and uncertainties in any stage of the decision-making process result in anxiety and reduce the customer experience (CX). Therefore, the natural aim of buyers is to reduce uncertainty and increase decision confidence.

The lower level of uncertainty – associated with the purchase – results in greater perceived control over the process, which provides a higher degree of confidence in purchasing decisions for customers (Schul & Mayo, 2003). Satisfaction with the decision-making process leads to consumption satisfaction and positively influences post-choice behaviour (Heitmann *et al.,* 2007).

The retail market is getting more and more competitive and saturated, so retailers are forced to constantly look for new customers. Knowing where to attract customers from and what are the characteristics of the target groups is essential. Based on this information, retailers can develop and implement strategies and activities, while determining touch points that best suit the needs of their customers' preferences. In this research, the data was used to define segments based on the technological readiness of Hungarian buyers. The segmentation method described in this research can be used to create a predictive model that identifies likely characteristics of attractive consumers.

Our research objective was to examine the channel choice of customers at different stages of the purchasing journey for high-value electronic devices on a non-representative sample of Hungarian customers. Although several statistical analyses deal with channel usage in Hungary, we did not come across any research that examined the relationship between technological readiness and the purchasing habits of the product category included in our study. That is why we thought it would be exciting and meaningful to investigate this area.

The purpose of this study was to examine how the respondents' technological readiness influenced the use of channels in the purchasing decision process of high-value electronic devices.

The following research questions were determined:

RQ1: What homogeneous groups can be identified in our sample based on technological readiness? Do the segments identified by Parasuraman and Colby (2015) based on the technological readiness index 2.0 (TRI) appear in our sample?

RQ2: Do the preferred channels at different stages of the technical product purchase process show a closer correlation with each other? (If someone prefers a given channel at a particular stage in the buying process, will they be more likely to prefer that channel later in the process?)

RQ3: Can we identify different patterns in channel preference of different segments based on TRI 2.0?

RQ4: What clusters can we identify based on channel preference?

RQ5: Can we find relationships between TRI segments and channel preference clusters?

This article will first examine the role of control in the shopping experience and the shopping patterns developed in practice based on a literature review. This will be followed by an overview of the methodology and the results of the primary analyses based on the formulated research objectives, based on which the researchers' conclusions will be presented.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Control Over the Purchasing Decision Process

The shift of power from retailers to consumers affects the equation, the sides of which are the perceived friction and the reward of shopping (Hammond, 2017). All internet-based innovation happens when retailers reduce purchase friction and increase shopping rewards. On the one side, the selection of friction variables might comprise travel distance, and the time needed to complete a shopping transaction; on the other side, reward factors could be *i.e.* price advantage, service quality, and thrill of speciality. One of the most important golden rules in channel choice to customers is for it to be easy to spend money.

Several research studies examined the customers' channel choice across the different stages of the decision process in relation to the different segments of buyers. There is a wide range of considered variables in this area. For instance, scholars examined the buyers' group channel choice based on the motivation of channel usage (Frasquet *et al*., 2015), and the attitude of buyers (Rodríguez-Torrico *et al*., 2017). Research also covers different product categories (Konuş *et al*., 2008) and examines channel choice based on sociodemographic variables, order hours, product categories, and communication strategies applied by the seller (Park & Lee, 2017).

The uncertainty associated with the purchasing decision can arise from factors related to the product, individual, or channel (Santos & Martins Gonçalves, 2019).

An important product-related factor is involvement (Frasquet *et al*., 2015). The higher the involvement, the more extensive the information needed (Puccinelli *et al*., 2009). For highly involved consumers, it is very important to choose the best option according to their shopping needs, and thus, they perceive a higher level of uncertainty in the purchase. In this study, we examined the purchasing decision process of valuable electronic devices that represents a big part of the buyers' budget which thus increases the level of involvement.

The individual factors are very complex. Determined by factors of the person's black box such as demographic attributes, motivation, perception, attitude, self-concept, and so on. In this study, besides the demographic characteristics, we examined how respondents' technological readiness influences channel choice during the purchasing process of expensive technical equipment.

Besides the involvement and internal factors, the CX is influenced by situational variables connected to the channel. Both offline and online channels have advantages and disadvantages in relation to the aim of decreasing decision uncertainty.

Table 1. Pros and cons of offline and online channels

Category	In-store	Online
Pros	Provides interactions with the products and other people (*e.g*., salesperson or other customers). The personal experience with a product; the ability to touch merchandise decrease the uncertainty of choice (Peck & Childers, 2003).	Besides the large amount of available information, it provides decision assistance tools to search, compare, and evaluate alternatives.
Cons	Provides only limited alternatives compared to the online channels.	Because of the limited cognitive capacity of consumers, great amounts of information can overload consumers' minds and result in confusion and anxiety (Walsh & Mitchell, 2010). The lack of interaction with products and other people may increase the level of uncertainty (Peck & Childers, 2003).

Source: own study.

Perceived security is an important factor in the perceived shopping experience (Davis & Venkatesh, 1996), while perceived security is influenced by technological readiness (Hallikainen *et al*., 2019; Parasuraman & Colby, 2015). Davis and Venkatesh (1996) created the technology acceptance model (TAM), which assesses and predicts user acceptance of emerging IT and captures extrinsic motivation by the perceived usefulness (PU – the extent to which an individual thinks that the use of a particular system enhances his/her own performance) and the perceived ease of use (PEU – the degree to which the individual needs mental and physical effort to use the system) (Keszey & Zsukk, 2017). Many findings prove that the components of the TAM model (PU and PEU) have a direct effect on customers' intention to use online channels (Oyman *et al*., 2022; Hansen *et al*., 2018; Hyun *et al*., 2022).

Parasuraman and Colby (2015) developed the technological readiness index (TRI 2.0) to measure customers' attitudes toward technology use. The TRI 2.0 includes four dimensions:

- Optimism – a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency.
- Innovativeness – a tendency to be a technology pioneer and thought leader.
- Discomfort – a perceived lack of control over technology and a feeling of being overwhelmed by it.
- Insecurity – distrust of technology, stemming from scepticism about its ability to work properly and concerns about its potentially harmful consequences.

The omnichannel service allows the customers to switch between online and offline channels during the navigation across various stages of the decision process, which enhances the customer shopping convenience. Based on their needs, the customer can choose the channel combination that best meets their expectations, which results in different channel usage patterns. An example may be the showrooming behaviour when consumers inspect a product at a seller's physical store before buying the same

product in a different seller's online store (Balakrishnan *et al*., 2014; Gensler *et al*., 2017; Mehra *et al*., 2013; Verhoef *et al*., 2015). Pseudo-showrooming used by Gu and Tayi (2016) refers to the consumer behaviour of inspecting a product at a seller's physical store before buying a related but different product in the same seller's online store. Webrooming behaviour means the practice of researching items online, and then buying them in store (Flavián *et al*., 2016; Santos & Martins Gonçalves, 2019).

These prior empirical results allowed us to assume the following research hypotheses:

H1: The groups identified by Parasuraman and Colby (2015) based on TRI 2.0 will also appear in our sample.

H2: Due to the importance of personal interaction, insistence on using the same channel occurs primarily among those who prefer to shop offline.

H3: The different TRI 2.0-based customer segments show different channel use patterns during their purchasing process.

RESEARCH METHODOLOGY

Data Collection

An online survey was conducted with convenience sampling. The Google form was shared on Facebook and among the students of two Hungarian universities (Budapest Business School (BBS) and. Hungarian University of Agriculture and Life Sciences (MATE)). The questionnaire was available between 10 February and 29 March 2022. During this period, 415 responses were collected.

Measurement

The questionnaire included measurement of the channel preferences of respondents. This part of the questionnaire measured the usage frequency of different channels (offline and online) in different stages (information search – evaluation of alternatives – purchase – payment – product return – post-purchase service (*e.g*., advice) – review/opinion share). The examined channels were in-store (offline) channels; small – (mobile) and big-screen (tablet, PC) online channels of high-value electronic device purchasing decision process.

The next topic of the questionnaire examined the technological readiness (TR) of respondents measured by the TRI 2.0 (Table 2) developed by Parasuraman and Colby (2015).

Table 2. Dimensions and statements of TRI 2.0

Optimism	OPT1. New technologies contribute to a better quality of life. OPT2. Technology gives me more freedom of mobility. OPT3. Technology gives people more control over their daily lives. OPT4. Technology makes me more productive in my personal life.
Innovativeness	INN1. Other people come to me for advice on new technologies. INN2. In general, I am among the first in my circle of colleagues and friends to acquire new technology when it appears. INN3. I can usually figure out new high-tech products and services without help from others. INN4. I keep up with the latest technological developments in my areas of interest.
Discomfort	DIS1. When I get technical support from a provider of a high-tech product or a service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do. DIS2. Technical support lines are not helpful because they don't explain things in terms I understand. DIS3. Sometimes, I think that technology systems are not designed for use by ordinary people. DIS4. There is no such thing as a manual for a high-tech product or a service that's written in plain language.
Insecurity	INS1. People are too dependent on technology to do things for them. INS2. Too much technology distracts people to a point that is harmful. INS3. Technology lowers the quality of relationships by reducing personal interaction. INS4. I do not feel confident doing business with a place that can only be reached online

Source: these questions comprise the technology readiness index 2.0, which is copyrighted by A. Parasuraman and Rockbridge Associates, Inc., 2014. This scale may be duplicated only with written permission from the authors.

We measured the statement of TR and the channel usage frequency on a 5-point Likert scale. In TR measurement scale 1 means 'I totally disagree' while 5 means 'totally agree,' while in channel usage frequency measurement 1 means 'I never use it' while 5 means 'I always use it.'

The last part of the questionnaire included demographic questions, *e.g.* about gender, age group, education level, residence, and perceived income level.

Considerations of Product Category Choice

We selected high-value electronic devices for various reasons:

- GlobalData (2021) predicts that by 2025 online sales penetration in the electronics product category will reach nearly 50% (49.6%), the highest rate among product categories.
- The valuable electronic devices represent big parts in the buyers' budget which increases the involvement level. For highly involved consumers, it is very important to choose the best option according to their shopping needs, and thus perceive a higher level of uncertainty in the purchase.

Data Analysis

SPSS 28.0 was used for data analysis. Besides descriptive statistics (frequency, mean, std. deviation), we examined the association between nominal variables by the Chí-squared test between variables measured on the Likert scale by variance analysis.

To reduce the distorting effect of close correlation among TRI and channel usage variables, factor analysis was conducted and followed by K-means cluster classification of the sample. Based on channel usage factors, we classified our respondents with the K-means cluster method. The channel usage pattern of different TRI segments was compared by variance analysis and the relationships between TRI segments and channel usage segments were examined by Chí-squared test.

Sample Composition

Our survey was filled by 415 respondents. Two third (60.5%) of our respondents were women and students from two Hungarian universities represented a large part of the sample (BBS and MATE), which is also reflected in the sample distribution of respondents by age group and place of residence. The perceived income level of most of our respondents was at least average, only 9.4 % of respondents perceived their income level as lower than average.

Table 3. Demographic distribution of the sample

Gender n (%)	**Male**				**Female**		
	161 (39.5)				**251 (60.5)**		
Age group n (%)	18 or younger	19-24	25-30 t	31-40	41-50	51-60	60 or older
	1 (0.2)	233 (56.1)	34 (8.2)	34 (8.2)	74 (17.8)	29 (7.0)	10 (2.4)
Education level n (%)	Completed 8 classes	Qualification	Graduation	Post-graduation certificate	BA/BSc certificate	MA/MSc certificate	PhD/DLA
	1 (0.2)	8 (1.9)	220 (53.0)	57 (13.7)	70 (16.9)	46 (11.1)	13 (3.1)
Region n (%)	Western Transdanubia	Central Transdanubia	Southern Transdanubia	Pest	Southern Great Plain	Northern Hungary	Northern Great Plain
	14 (3.4)	16 (3.9)	19 (4.6)	228 (54.9) on which Budapest 140	21 (5.1)	101 (24.3)	16 (3.9)

Income level n (%)	Well below average	Below average	Average	Above average	Well above average
	7 (1.7)	32 (7.7)	227 (54.7)	133 (32.0)	16 (3.9)

Source: own study.

RESULTS AND DISCUSSION

The Technology Readiness index 2.0 in the Sample (RQ1.)

The lower level of uncertainty – associated with the purchase – results in greater perceived control over the process, which provides a higher degree of confidence in purchasing decisions for customers (Schul & Mayo, 2003). The online channel usage is influenced by the buyer's attitude toward the technology and through it, the attitude toward online channels. For this reason, we examined how respondents perceived their own technological readiness.

We measured respondents' attitudes toward the technology on a five-point Likert-scale according to the TRI 2.0 by Parasuraman and Colby (2015) (Table 2). To examine how well our survey results fit the factors of the TRI 2.0 model, firstly, we performed a factor analysis on 16 questions on technological readiness.

As previously mentioned, two of the dimensions are motivators (optimism and innovativeness) and two are inhibitor themes (insecurity and discomfort). Therefore, firstly, we reverse-coded the insecurity and discomfort dimensions by subtracting from 6 (Marked by: Rev in Table 4).

Based on the results of Kaiser-Meyer-Olkin (KMO) test for sampling adequacy (0.783) and Bartlett's sphericity test (Sig. 0.000) our sample was appropriate for the factor analysis.

Our factor analysis of the 16 technological readiness variables showed four components. The eight statements belonging to motivator variables formed two factors, the innovativeness and the optimism factors including the 4-4 statements according to Parasuraman and Colby TRI 2.0 measurement method. The eight inhibitor statements also formed two factors, discomfort and insecurity. Here, we found a slight difference in the case of the fourth variable of insecurity ('I do not feel confident doing business with a place that can only be reached online'). Although both the inhibitor factors sit on variables, the correlation is greater in the case of the discomfort factor (Table 4).

Table 4. Rotated component matrix of technological readiness questions

Component	Discomfort	Innovativeness	Insecurity	Optimism
RevDIS2	0.791	0.080	0.119	-0.020
RevDIS4	0.785	0.146	0.089	0.060
RevDIS3	0.774	0.074	0.134	0.024
RevDIS1	0.656	-0.311	-0.025	0.086
RevINS4	0.456	0.117	0.304	-0.066
INN4	0.165	0.798	0.008	0.168
INN3	0.276	0.789	-0.052	0.046
INN1	-0.028	0.788	0.000	0.078
INN2	-0.200	0.721	0.156	0.178
RevINS2	0.174	0.063	0.817	0.126
RevINS3	0.103	0.087	0.793	0.043
RevINS1	0.127	-0.108	0.730	0.094
OPT1	0.168	0.144	-0.019	0.788
OPT2	0.257	0.146	-0.015	0.733
OPT3	-0.205	0.022	0.121	0.673
OPT4	-0.143	0.162	0.355	0.593

Source: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 6 iterations.

Because we examined a unique group of people – buyers of electronic devices selected with convenience sampling methods – we decided to retain all the measurement items in the analysis according to the original technology readiness index 2.0 despite this slight difference we have found.

Parasuraman and Colby (2001) developed a segmentation scheme (TRI 1.0), which they later improved and developed as the TRI 2.0 scheme (Table 2), and they defined five categories of respondents based on their pattern of beliefs about technology:

- Sceptics – tend to have a detached view of technology, with less extreme positive and negative beliefs.
- Explorers – tend to have a high degree of motivation and a low degree of resistance.
- Avoiders – tend to have a high degree of resistance and a low degree of motivation.
- Pioneers – tend to hold both strong positive and negative views about technology.
- Hesitators – stand out due to their low degree of innovativeness (Parasuraman & Colby, 2015).

This classification was created using a proprietary algorithm, therefore, we sent our SPSS dataset to Rockbridge, to classify our dataset.

Sample Composition Based on TRI Segments

Comparing the TRI segment composition in our sample with the US norm 2021 provided by Rockbridge (Figure 1), the biggest differences (more than 10%) are in the sceptic and avoider segments. We have more sceptics but fewer avoiders, which could be due to the age of the respondents, because the younger generation (under 30) was overrepresented (more than 60%) in our sample.

The majority of our respondents (Table 5) were sceptics (44.6%). The TRI means are in the second half among the five segments; they are in the fourth place in optimism, discomfort, and insecurity dimensions, and third in innovativeness.

The number of explorers and hesitators was the same, they both represent 17.8% of the sample.

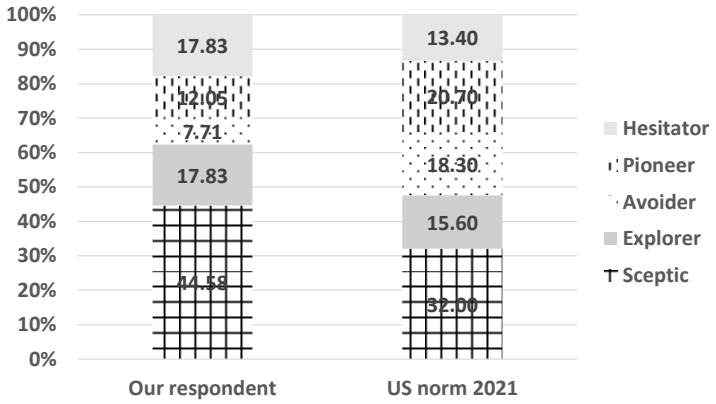

Figure 1. The proportion of the TRI segments in our sample compared to the 2021 norm in the USA
Source: own elaboration based on information from Rockbridge and our survey.

Table 5. The TRI segment composition and means of TRI dimensions in different segments in our sample

Segments (n)	%	Means (Rank)				
		Optimism	Innovativeness	Discomfort	Insecurity	TRI
Sceptic (185)	44.6	3.46 (4)	3.12 (3)	2.28 (4)	3.57 (4)	3.18
Explorer (74)	17.8	4.28 (1)	3.90 (2)	1.81(5)	2.78(5)	3.90
Hesitator (74)	17.8	3.89 (3)	1.98 (5)	2.77 (3)	3.78 (3)	2.83
Pioneer (50)	12.0	4.10 (2)	3.98 (1)	3.48 (1)	4.14 (1)	3.12
Avoider (32)	7.7	2.74 (5)	2.01 (4)	2.93 (2)	4.15 (2)	2.42
Total (415)	100.0	3.70	3.07	2.48	3.58	3.18

Source: own elaboration based on our survey.

Explorers showed a high degree of motivation (first and second place in the ranking of motivator dimensions), and a low degree of resistance (last in both inhibitor dimensions).

Hesitators stood out due to their low degree of innovativeness (they were last in ranking), while in other dimensions (both motivator and inhibitor) they were in the middle.

The percentage of pioneers was 12%. They held both strong positive and negative views about technology.

The percentage of avoiders was the lowest (7.7%). They tended to have a high degree of resistance (second place in ranking) and a low degree of motivation (fourth and fifth place in ranking)

These technological readiness profiles are in line with the results of Parasuraman and Colby (2015).

Evaluating the total TRI scores – where the lowest possible is 1.0 and the highest is 5.0, and a higher score indicates higher techno-readiness – we can examine the distribution of segments among low, medium, and high TR score levels (Table 6.)

Table 6. Distribution of TRI segments among the TR tiers

TRI segment	TR tier n (% within the segment)			Total
	low (1 – 2.75)	middle (>2.75 – <3.25)	high (3.25 – 5)	
Sceptic	18 (9.7%)	83 (44.9%)	84 (45.4%)	185
Explorer	0 (0%)	0 (0%)	74 (100%)	74
Avoider	30 (93.8%)	2 (6.3%)	0 (0%)	32
Pioneer	6 (12.0%)	26 (52.0%)	18 (36%)	50
Hesitator	37 (50%)	29 (39.2 %)	8 (10.8%)	74
Total	91 (21.9%)	140 (33.7%)	184 (44.3%)	415

Source: own elaboration.

The TR tier composition of TRI segments based on total TRI scores confirmed the profiles of the segments. All explorers belonged to the highest TR tier, but none of the avoiders fell in the highest tier. Most of the hesitators showed at most the middle tier of TR, while the majority of sceptics and pioneers showed the middle or high tier of IT.

In the total sample, most of our respondents (44.3%) belonged to the high TR tier, more than one-third to the middle tier, and about one-fifth (21.9%) to the low tier.

Factor analysis of channel preference variables (RQ2.)

The stages of purchasing decision process are the need recognition – information search – evaluation of alternatives – purchase – post-purchase. In our survey, we examined channel usage in the case of information search – evaluation of alternatives – purchase – payment – aftersales service – return goods – review. We examined the frequency of use of channels – in-store, online big screen and small screen (mobile) – at these stages.

The respondent could evaluate the statements on channel preference at the different stages of purchasing decision on Likert scale (1 – I never use it, 2 – I use it rarely, 3 – sometimes I use it, 4 – I use it frequently, 5 – I always use it).

To reduce the number of variables, we conducted a factor analysis on the 21-channel usage variables (7 stages x 3 channels). The KMO value was 0.73 and the significance level of Bartlett's sphericity test was 0.000, which confirmed that our sample was appropriate for the factor analysis.

The factor analysis reduced the 21 variables to six factors and it could hold 70.88% of the information.

Six stages of the in-store purchasing process (except the review) belonged to a single factor. Five stages of the big screen online shopping process also showed a separate item (except the review and return). In the case of small screen (mobile) usage the pre- and post-purchase steps belong to the same factors. Interestingly, mobile purchases and payments belong to a separate factor. The fifth and sixth factors include the online (both small and big screen) review and return activities in order. Table 7 shows the variable composition of factors in the rotated component matrix and their labels based on variables.

Relationship Between TRI Segments and Channel Preference Factors (RQ3.)

We examined the relationship between the TRI segments and the six-channel usage factors. The variance analysis showed a significant relationship in the case of the in-store process factor (sign. 0.003), Small screen pre- and post-purchase steps (0.05), and the review online factor (sign 0.01). Interestingly, the online big screen usage did not show a statistical relationship with TRI segments.

Although only half of the six factors showed significant relationships with the TRI segment, the box-plot diagram (which shows the distribution of the factors around the factor centres by TRI clusters) revealed interesting tendencies (Figure 2).

Table 7. Rotated component matrix of channel usage variables

Category		Component					
		In-store process	Big screen process	Small screen usage pre – and post-purchase	Purchase and pay-ment on mobile	Review online	Return online
Evaluation	In-store	0.838	-0.028	-0.114	0.027	0.011	-0.003
Information search	In-store	0.836	-0.038	-0.069	-0.021	-0.015	-0.008
Post-purchase service	In-store	0.783	-0.114	-0.035	0.008	0.049	-0.027
Purchase	In-store	0.693	-0.049	0.121	-0.361	-0.109	-0.131
Payment	In-store	0.608	-0.013	0.169	-0.404	-0.051	-0.205
Return	In-store	0.518	0.006	0.199	-0.158	0.015	-0.381
Evaluation	Big screen	-0.005	0.903	0.076	0.014	0.017	-0.055
Information search	Big screen	0.033	0.901	0.062	-0.024	-0.006	-0.036
Post-purchase service	Big screen	-0.158	0.691	0.152	-0.146	0.102	0.341
Purchase	Big screen	-0.170	0.619	-0.030	0.562	0.082	0.091
Payment	Big screen	-0.196	0.563	-0.065	0.531	0.126	0.214
Evaluation	Mobile	0.016	0.085	0.856	0.172	0.002	-0.053
Information search	Mobile	0.004	0.089	0.850	0.120	0.009	-0.037
Post-purchase service	Mobile	-0.022	-0.010	0.770	-0.019	0.056	0.277
Review	Offline	0.159	0.134	0.336	-0.268	0.139	-0.035
Purchase	Mobile	-0.094	-0.049	0.469	0.690	0.116	0.146
Payment	Mobile	-0.129	-0.025	0.460	0.642	0.132	0.250
Review	Big screen	-0.021	0.165	-0.058	0.055	0.928	0.087
Review	Mobile	-0.004	-0.038	0.206	0.114	0.922	0.069
Return	Big screen	-0.152	0.322	-0.028	0.137	0.116	0.800
Return	Mobile	-0.095	-0.113	0.371	0.280	0.080	0.753

Notes: Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser Normalization. a. Rotation converged in six iterations.
Source: own study.

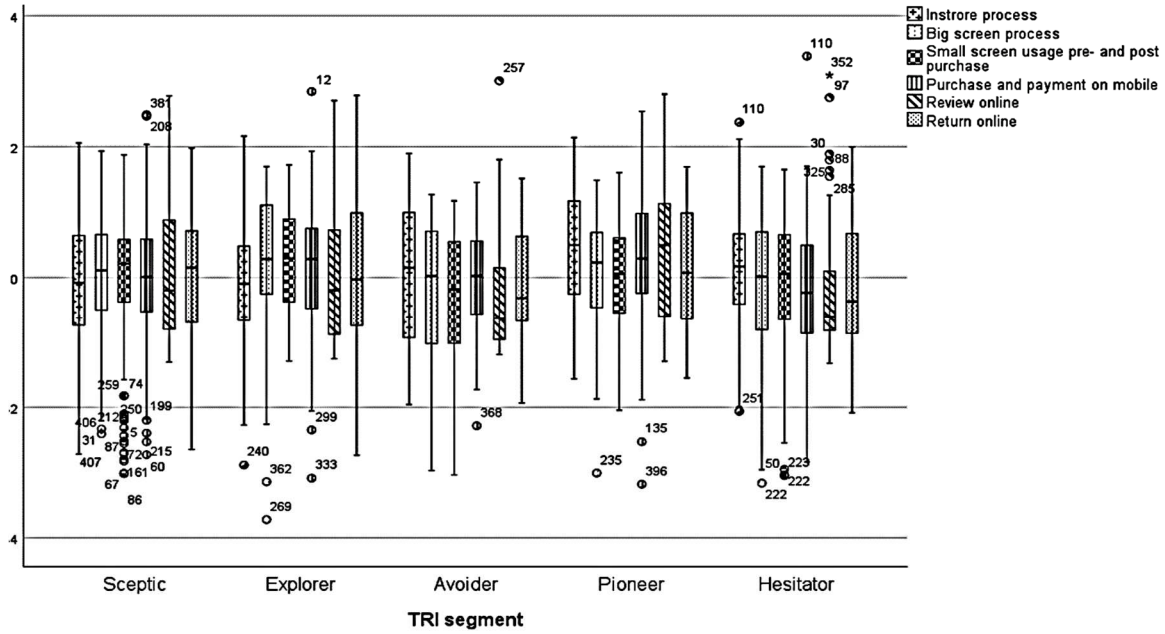

Figure 2. Boxplot diagram of channel preference factors of TRI segments
Source: own elaboration.

Pioneers showed strong positive and negative views in TRI dimensions. According to this, all the factor centres of pioneers are higher than the factor centres of the total sample, and especially high in the in-store process and review online factors.

Explorers, who showed a high degree of motivation and low degree of resistance in TRI dimensions, on boxplot diagram show higher level factor centre values than the total sample at online channel usage (both big and small screen process – besides the mobile pre- and post-purchase steps in purchase and payment).

Hesitators, who stand out due to their low degree of innovativeness but were in the middle in other TRI dimensions, on boxplot diagram show at most equal or less factor centre value compared to the whole sample, but at the in-store process. It means that the hesitators prefer the in-store process during the whole purchasing decision process instead of online channels in comparison with other TRI segments.

Avoiders showed a high degree of resistance and a low degree of motivation in TRI dimensions. The factor centres of this segment show a very similar pattern to the hesitators, with lower levels of mobile pre- and post-purchase factor centres.

Sceptics showed less extreme positive and negative beliefs. On the boxplot diagram, the factor centres slightly differ from the factor centres of the total sample. This segment prefers the online channels rather than the in-store process compared to the whole sample.

The conclusion of the pattern of factor centres by TRI segments is that the perceived TR affected channel usage during the purchasing decision process. Moreover, the channel preferences were in accordance with the TRI dimensions of segments.

Clusters Based on Channel Preference Factors (RQ4.)

Based on the channel usage preference factors, we classified our 415 respondents by K-means cluster analysis from two-cluster to eight-cluster solution.

The distribution of samples among the clusters is relatively balanced in each of these solutions. From these cluster solutions the four, six, seven, and eight-cluster classifications showed significant (less than 0.001 sig. level) in each channel factor. Examining these classifications, the four-cluster solution proved to be the best to interpret, therefore, we examined this cluster solution further.

Based on the factor centres deviation of the first cluster, its representatives prefer the in-store and big-screen channels compared to the whole sample. While they prefer less mobile devices at the beginning of the purchasing decision process, they are willing to purchase, pay and return on online mobile channels, but they rarely review their experience either online or offline (offline review in the third factor) – small-screen avoiders.

The second cluster uses less in-store channels and more both big and small-screen online channels. Mobile usage is rather important in the first stages of purchasing decision process, the purchase and payment on mobile are similar to or slightly under the whole samples factor centre, and they rarely use the online channels at the post-purchase stage (return and review) – online buyers.

The third cluster is characterized by the low frequency of online big-screen channel usage. They use offline channels and online mobile channels similarly to the whole sample (mobile online channel slightly more frequently) – in-motion buyers.

The fourth cluster's in-store purchasing is completely in line with the whole sample. The online channel usage (both big and small screen) is slightly over the sample's factor centres. Online reviewing is an outstanding habit of this group – opinion-sharing balanced channel users.

Interestingly, we did not find an 'offline segment' among our respondent segments, which is reported in many multi-channel segmentation research (Neslin, 2022). The presence of the offline segment was also reported in research that also covered the purchase of electronic goods (Valentini *et al*., 2020; Herhausen *et al*., 2019) The fact that we could not identify the typical in-store customer among our respondents – in addition to the bias resulting from convenient sampling – may also result from the fact that the pandemic strongly pushed customers towards online channels.

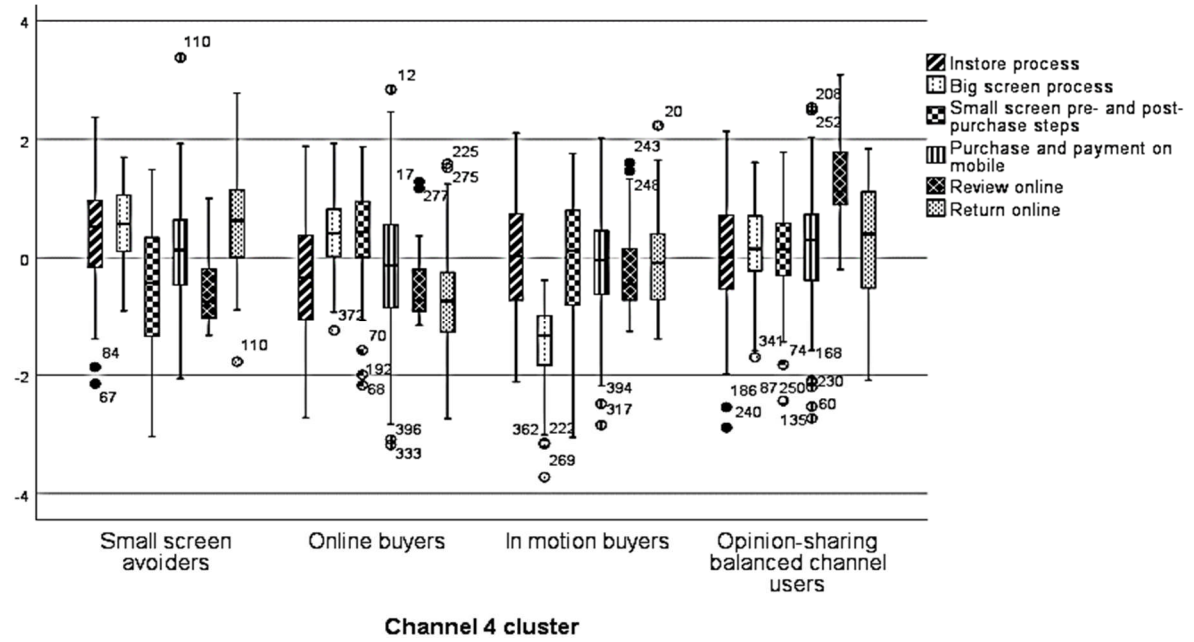

Figure 3. The boxplot of channel preference factors for the four clusters
Source: own elaboration.

Demographic Distribution of Respondents Among Channel Usage Clusters

Examination of the demographic distribution of clusters – based on gender, age group, residence region of the country, education level, and perceived income level – showed significant differences in the case of age groups only (Table 8).

Table 8. Age composition of channel usage clusters

Age group	Channel clusters n (% within the age group)				Total
	Small-screen avoiders	Online buyers	In motion buyers	Opinion-sharing balanced channel users	
Between 19-24	48 (20.6)	80 (34.3)	47 (20.2)	58 (24.9)	233 (100)
Between 25-30	8 (23.5)	7 (20.6)	9 (26.5)	10 (29.4)	34 (100)
Between 31-40	4 (11.8)	7 (20.6)	9 (26.5)	14 (41.2)	34 (100)
Between 41-50	28 (37.8)	14 (18.9)	14 (18.9)	18 (24.3)	74 (100)
Between 51-60	12 (41.4)	4 (13.8)	6 (20.7)	7 (24.1)	29 (100)
Over 60	4 (40.0)	0 (0.0)	2 (20.0)	4 (40.0)	10 (100)
Total	104 (25.1)	112 (27.1)	87 (21.0)	111 (26.8)	414* (100)

Note: *Only one respondent was under 18 years of age, therefore, we considered this respondent as missing value.
Source: own study.

The proportion of the youngest group (19-24) was the highest in the online buyer group. More than one-third (34.3%) of the youngest respondent belonged to this cluster. The proportion of 25-30 and 31-40-years respondents was identically 20.6% in this cluster, while the proportion of the elder generation decreased with age.

While the proportion of the age groups of 25-30 and 31-40 years was the same in online buyer and in-motion buyer clusters, the 25-30 years age group distribution was more balanced among the four-channel usage cluster. The 31-40 years age group proportion was the highest (41.2%) in the opinion-sharing and balanced channel user cluster and the lowest in the small-screen avoider group (11.8%) comparing the proportions of other age groups in these clusters.

The older age groups (over 41 years) represented a remarkably higher proportion in small-screen avoider group (37.8, 41.1, and 40%).

Although a big ratio of the oldest group (40-40%) belongs to small-screen avoider and opinion-sharing balanced buyer clusters, because of the very low number of respondents in this age group, no conclusions were drawn in this regard.

There was no significant relationship between the other examined demographic characteristics and the channel clusters. An interesting trend emerged in gender distribution. While the women's distribution was balanced among the clusters (about one-fourth of women in each cluster), the distribution of men was less balanced, because one-third of men (30.5%) belonged to opinion-sharing balanced channel users and only 15.9% to the in-motion buyer group.

The Relationship Between TRI Segments and Channel Clusters (RQ5.)

Does the TR have a significant effect on the channel usage? To discover it, we conducted Chi-squared tests between the TRI segments and the channel usage segments showed significant (sig. level is 0.049) relationship. Table 9 shows the distribution of TRI 2.0 segments among the channel usage clusters. The TRI was considered an explanatory variable because technological readiness influences the channel's perceived usefulness and its ease of use.

The sceptics' distribution among the channel usage clusters was relatively balanced. This TRI segment did not show outstanding participation in any channel usage cluster. This result was in accordance with the TRI segment description: tend to have a detached view of technology, with less extreme positive and negative beliefs.

The proportion of explorers (a high degree of motivation and a low degree of resistance) was much lower in the 'in-motion buyers' group than in the other channel usage groups.

More than one-third of avoiders (who have a high degree of resistance and low degree of motivation) were in the 'small-screen avoider' cluster.

Table 9. Distribution of TRI segments among the channel usage clusters

Channel usage clusters	TRI segment n (% within TRI segment)					Total
	Sceptic	Explorer	Avoider	Pioneer	Hesitator	
Small-screen avoiders	44 (23.8)	20 (27.0)	11 (34.4)	10 (20.0)	19 (25.7)	104 (25.1)
Online buyers	50 (27.0)	21 (28.4)	8 (25.0)	9 (18.0)	25 (33.8)	113 (27.2)
In motion buyers	39(21.1)	12 (16.2)	9 (28.1)	8 (16.0)	19 (25.7)	87 (21.0)
Op. sharing balanced channel users	52 (28.1)	21 (28.4)	4 (12.5)	23 (46.0)	11 (14.9)	111 (26.7)
Total	185 (100.0)	74 (100.0)	32 (100.0)	50 (100.0)	74 (100.0)	415 (100.0)

Source: own study.

Pioneers (holding both strong positive and negative views about technology) were highly represented in the opinion-sharing balanced channel user group, while only the lowest proportion (14.9%) of hesitators (they show a low degree of innovativeness) belonged to this channel usage group.

RESULTS AND DISCUSSION

In accordance with the research objectives, the research found the following.

RQ1. The study aimed to examine how respondents' technological readiness influences channel use preference at different stages of the purchasing decision process for high-value electronic devices. We first sought to identify homogeneous groups based on the TRI 2.0 of Parasuraman and Colby (2015). We identified the same TRI segments (sceptics, explorers, avoiders, pioneers, and hesitaters) with the same characteristics described in the study of Parasuraman and Colby (2015). Thus, the H1 hypothesis was confirmed.

RQ2. Factor analysis was performed to examine the relationship among channel usage variables. We could reduce the number of 21 variables to six items, where six stages from the examined seven of the in-store purchasing process belonged to a single factor. Five stages of the big screen online shopping process also showed a separate item (except the review and return). On the other hand, the stages of mobile online shopping were more divided among the factors. Based on this,

the preference for using offline channels correlated at almost every stage of the customer journey, while in the case of online channels – especially on the mobile channel – the channel usage of successive stages did not show such a close correlation. Therefore, we could neither confirm nor reject the H2 hypothesis.

RQ3. Do the TRI segments show different channel usage patterns? Three of the six-channel usage factors showed significant relationships with the TRI segment. The pattern of factor centres of different TRI segments confirmed that the perceived TR affects the channel usage during purchasing decision process, and the channel preferences were in accordance with the TRI dimensions of segments. *This result confirmed the H3 hypothesis.*

RQ4. Cluster analysis of channel usage factors resulted in different cluster number solutions. Based on the interpretability, the four-cluster solution was chosen, including small-screen avoider, online buyer, in-motion buyer, and opinion-sharing balanced channel user groups. These groups based on different patterns of channel usage factors showed significantly different age group composition. Unsurprisingly, while a high proportion of younger respondents belonged to online buyers, a bigger proportion of the elder generation belonged to the small-screen avoider cluster.

RQ5. Hypothesis H3 was examined in another approach when we searched for relationship between TRI segments and channel preference clusters. Our findings showed a relationship at the 5% significance level, which *confirmed the H3 hypothesis.* This means that, in line with the findings of Hallikainen *et al*. (2019), the technological readiness of the customer has a significant impact on channel preference.

CONCLUSIONS

Consumers' perceived value of the purchasing experience is influenced by the total purchasing decision process starting at the need recognition and ending at the post-purchasing stage. The difficulties and uncertainties in any stage of the decision-making process result in anxiety and deteriorate the customer experience. The uncertainty can arise from factors related to the product, individual, or channel (Santos & Martins Gonçalves, 2019). In this study, all the three factors were considered. The expensive, more complex products like the high-value electronic device, increase customer's involvement. The higher the involvement, the more frustrating the decision-making process is. Regarding individual factor – besides the demographic characteristics – we considered the technological readiness of our respondents. The uncertainty associated with the channel was examined by comparing three channels (in-store, online large and small screen) at different stages of the customer journey.

Our sample showed the TRI 2.0 segment distribution – although our sampling method was not representative, this is the first research (we did not encounter any articles of this kind) which examined a Hungarian sample based on this measurement method. Our findings confirmed that perceived technological readiness influences customers' channel choice.

Managerial Implication

In our sample, we could not identify a typical in-store customer group based on channel usage preferences during the customer journey, which contrasts with the results of several pre-pandemic studies (Valentini *et al.*, 2020; Herhausen *et al.*, 2019). Although no reliable conclusion can be drawn from this due to the non-representative sampling method of our study and the different geographical and cultural background of the mentioned papers, according to our assumptions, the pandemic may play a decisive role in this difference. Pandemic-related safety concerns have strongly driven shoppers to use contactless online channels (including those who otherwise strongly adhere to brick-and-mortar stores, and even for products where physical touch can be important) (Arun *et al*., 2020; Kannan & Kulkarni, 2021; Zielke *et al*., 2023), which findings support our assumption.

Successful marketing is about reaching a customer with an interesting offer when he or she is primed to accept it, thus, knowing what might interest the customer is half the battle to making the sale and this is where customer analytics comes in. In terms of technological readiness, customer analytics has evolved from analysing and reporting customer behaviour to segmenting customers based

on their responsiveness to improve buying predictions and actually 'manipulate' customer behaviour with target-specific promotional offers and marketing campaigns. One of the conclusions based on this research is that retailers need a complex view of the customer in real-time that will enable their marketers to deliver personalized experiences whenever the customer is primed to receive them.

Firstly, our results confirmed that there is a significant relationship between technological readiness and channel usage preferences, which is consistent with findings that have shown the effect of technology acceptance on customers' intention to use online channels.

On the other hand, our sample showed significant differences in channel preference according to the age groups. More than one-third of the youngest (19-24 years) respondents frequently use both big and small-screen online channels, which means that electronics retailers can successfully reach them on different online channels. Respondents between the ages of 25 and 40 are more likely to be reached on offline and mobile online channels, and those over 41 are more likely to be reached on offline and large-screen channels and also less likely to be reached on small-screen channels.

Limitations and Further Research

A limitation of this study is the non-probability (convenience) sampling method, as the 19-24 age group (university students) and respondents from central and northern parts of Hungary were overrepresented. To confirm our above proposals, a large-sample representative study would be needed in the future.

This study focused on the purchasing of high-value electronic devices. In the future, it would be interesting to evaluate and compare the free-riding omnichannel behavioural segments of customers during the customer journey regarding other product categories.

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Authors

The contribution share of authors is equal and amounted to 33% for each of them.

Krisztina Taralik

C.Sc. Senior research fellow, Department of Commerce, Budapest Business School University of Applied Science, Hungary. Her research interests include consumer behaviour, digital marketing, and omnichannel marketing.
Correspondence to: Krisztina Taralik, Budapest Business School University of Applied Science, Faculty of Commerce, Hospitality and Tourism, Department of Commerce, Budapest Alkotmány u. 9-11, 1054 Hungary, e-mail: Taralik.krisztina@uni-bge.hu
ORCID http://orcid.org/0000-0003-4181-1208

Tamás Kozák

PhD, Head of the Department of Commerce, Associate professor, Department of Commerce, Budapest Business School University of Applied Science, Hungary. His research interests include disruptive technics in retailing, and financial models facilitating economic decisions.
Correspondence to: Tamás Kozák, Budapest Business School University of Applied Science, Faculty of Commerce, Hospitality and Tourism, Department of Commerce, Budapest Alkotmány u. 9-11, 1054 Hungary, e-mail: kozak.tamas@uni-bge.hu
ORCID http://orcid.org/0000-0003-3481-6545

Zsolt Molnár

Professor of the Practice, Department of Commerce, Budapest Business School University of Applied Science, Hungary. His research interests include social and communication role of international volunteering, consumer behaviour, CSR role and implications of social communication.
Correspondence to: Zsolt Molnár, Budapest Business School University of Applied Science, Faculty of Commerce, Hospitality and Tourism, Department of Commerce, Budapest Alkotmány u. 9-11, 1054 Hungary, e-mail: molnar.zsolt@uni-bge.hu
ORCID http://orcid.org/0000-0001-5554-1275

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