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INTERACTIVE SHOPPING AIDS USAGE BY CONSUMERS AS A WAY TO REDUCE SHOPPING RISK

Introduction

In the consumer behavior literature[1] there exist several models of consumer purchasing process - defining and describing its stages, length, or complexity. In most popular approaches the process starts at the time of recognition of particular consumer needs, then he or she wants to satisfy by seeking the product/offer with specific parameters. Next are comparison of offers and as a result – decision to buy product chosen, with some post-purchase behavior. However, when the number of perceived alternatives increases, decision difficulties are arising as an effect of growth of the advertising intensiveness and diversity of advertising tools, as well as significant changes in retail industry including the physical channel and virtual channel competition or complementarity. The reason to use interactive shopping aids (later abbreviated to ISA) is to help with right decision making.

More formally ISA are specialized types of so-called *interactive decision aids* (IDA), that "(…) help consumers in making informed purchase decisions amidst the vast availability of online product offerings"[2]. In this case word interactive describes situation when the consumer is accessing service (online database) and on demand gets customized content and feedback in real time[3]. Interac-

[1] M. Pachauri: *Consumer Behavior a Literature Review.* „Marketing Review" 2002, Vol. 2, No. 3, p. 319; C.L. Tyagi, A. Kumar: *Consumer Behaviour*. Atlantic Publishers & Dist 2004, p. 55.

[2] W. Wang, I. Benbasat: *Interactive Decision Aids for Consumer Decision Making in e-commerce: The Influence of Perceived Strategy Restrictiveness*. "MIS Quarterly" 2009, Vol. 33, No. 2, p. 3.

[3] G. Häubl, V. Trifts: *Consumer Decision Making in Online Shopping Environments: The Effects of Interactive Decision Aids*. „Marketing science" 2000, Vol. 19, No. 1, pp. 4-21.

tive shopping aids assist some consumer processes during their decision-making by eliciting preferences, carrying search and produce recommendations. Typically there are two kinds of IDA – recommendation systems (including recommendation agents – RA) – focused on eliciting preferences and providing recommendations, and interactive information management tools (IIMT) – focused on comparing product information[4]. This typology applies to ISA too. In this paper are also presented internet shopping aids that are not literally interactive, but are perceived by their users this way.

Interactive shopping aids (ISA) became widely used by consumers in recent years. Information technology progress made easily available to consumer such internet services starting from fully automated solutions as comparison-shopping agents, bidding agents on auction platforms as well as externally accessible and internet-store internal recommendation agents; up to consumer recommendation sites and consumer communities (forum-based and social media based). Many solutions became available for mobile devices as smartphones and tablets, making possible to use them during physical store visit. Most consumers using interactive shopping aids declare as reasons of their usage the possibility to choose better products within considered category and constraints (as price, brand, features, etc.) and/or finding lowest acceptable prices[5]. This approach suggests that consumers are using mentioned shopping aids to reduce some risks connected with shopping, perceived often as significant in virtual channel and neglected in physical one.

In Poland authors found much lower (but generally increasing) level of such tools usage by consumers comparing to higher developed countries. Paper presents results from two samples – mainly current research conducted in end of 2012 and historical data from previous study conducted by first author conducted in 2008. Where it is possible direct comparisons are made. On the base of declared frequency of usage analyzed by gender and age connections with virtual channel perception and usage is analyzed, including possible interactions of interactive shopping aids with channel connected risks.

Research has been founded from public funds through grant given by Polish National Center for Science to first author.

[4] J. Pfeiffer: *Interactive Decision Aids*, In: *Interactive Decision Aids in E-Commerce*, Physica-Verlag HD 2012, Contributions to Management Science, p. 93, http://link.springer.com/chapter/10.1007/978-3-7908-2769-9_5.

[5] Authors own unpublished qualitative research (using FGI and IDI methods).

1. Method

Analyzed data are coming from two large nationwide samples, representative (regarding Internet-based data collection method) for population of Internet users in Poland regarding gender and age (between 16 and about 65 years old). Data were collected by CAWI questionnaire in 2008 for first sample (n = 1100) and at the end of 2012 for the second one (n = 1700). Presented data are part of larger study devoted to explanation and modeling in more general way the influence of ICT on consumer behavior.

Measures used in paper include among others declared frequency of interactive shopping aids (ISA) in 12 forms for 2012 and 8 forms for 2009), as well as typical demographic variables and selected characteristics of consumer including decision-making styles (in terms of Sproles and Kendall[6] approach, modified by first author[7]); virtual channel perception including risk (measured using Mokhtarian and Tang[8] approach, adapted by first author[9]; as well personal innovativeness in domain of Information Technology (PIIT) introduced by Agarwal and Prasad[10] in first author adaptation for 2012 study pourpose.

Two main research questions has been raised:

RQ1. What demographic and psychographic variables are influencing ISA usage (including interactions)?

RQ2. What role (if any) ISA play in decision-making risk reduction for purchases in virtual channel?

Data analysis relies on descriptive statistics with analysis of variance and graphs. Path modeling on 2012 data has been also performed.

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[6] G. B. Sproles, E. L. Kendall: *A Methodology for Profiling Consumers' Decision-Marking Styles*. "Journal of Consumer Affairs" 1986, Vol. 20, No. 2, p. 267.

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2. Interactive shopping aids usage among Polish consumers

Between two measurement periods interactive shopping aids (ISA) usage became more popular in Poland. In first author research from 2008 about 1/3 of Internet users declared not using any of 8 types of ISA specified in questionnaire, while recent study shows that this share fallen to below of 1/4 of such population for 12 types of ISA specified in 2012.

Detailed structures of answers are shown in Figure 1. Visible is an increase of percentage of respondents declaring any usage of particular ISAs (in 2012 comparing with 2008), and what is rather surprising – decrease of persons declaring very often usage of them. Growth of popularity is easily explained by diffusion of innovation approach, but decrease of ISA "heavy users" seems to be connected with time and effort needed to carefully assess all Internet purchasing activities, so part of them are using some decision heuristics to avoid excessive effort to do so. For product reviews and sellers opinions there is also another possible explanation – persons relying on them in the past – could personally experience so called "amplifying" practices and perceive such opinions as unreliable. This not applies to easily verifiable price comparisons.

Most popular tools used by consumers are remaining the same: product reviews in Internet communities or Social Media (67,1% of using in 2008 vs. 76,5%), opinions about sellers in Internet communities or Social Media (67% vs. 71,6%), and price comparison services (59,2% vs. 75,4%). Least popular are still bidding agents on auction platforms (20,2% vs. 30,1% – although on Allegro.pl leading platform in Poland sales with bidding becomes rare), and other ISAs. Biggest growth of users is for in-store internal ads (online stores promoting themselves on own website) – growth of about 20 percentage point of users, as well as for mentioned price comparison services – 16,2 percentage points of growth.

For most ISAs about 1/3 of consumers used them regularly for part of their online purchases in 2012 study (Table 1). This suggests relative fall of interest in using ISAs comparing with previous study form 2008. Also average frequency of ISA usage among respondents declaring active usage of them fallen between 2 studies (right column of Table 1).

Table 1

Declared frequency of ISA usage – structure of answers and averages (in %)

Specification	Year	Answers					Average usage frequency (excluding non-users) (2-5 scale)
		I don't use at all	I use rarely	I use for part of purchases	I use for most of purchases	I use for all of purchases	
price comparison service	2012	24,6	23,2	33,6	12,5	6,1	3,02
	2008	40,8	14,2	15,5	17,9	11,5	3,45
bidding agents on auction platforms	2012	69,9	14,6	12,2	2,6	0,7	2,65
	2008	79,8	8,9	6,4	3,7	1,2	2,86
online consumer reviews service	2012	32,1	24,5	30,9	10,1	2,4	2,86
	2008	Not asked					N/A
store recommendations based on other customers purchases	2012	30,2	25,4	31,7	10,9	1,9	2,85
	2008	39,0	21,4	15,6	17,4	6,6	3,15
store recommendations based on own previous purchases	2012	32,4	23,4	30,1	11,2	2,9	2,90
	2008	46,1	19,0	16,6	14,4	4,0	3,06
in-store internal ads	2012	40,0	28,6	24,5	5,4	1,5	2,66
	2008	59,4	24,2	10,0	4,6	1,8	2,60
product reviews in internet communities or Social Media	2012	23,5	24,8	34,7	13,3	3,6	2,94
	2008	32,9	15,6	17,1	21,8	12,6	3,47
product reviews on comparison shopping service	2012	24,6	24,9	34,1	13,4	3,0	2,93
	2008	Not asked					N/A
opinions about sellers in Internet communities or Social Media	2012	28,4	24,7	30,1	13,6	3,3	2,94
	2008	33,0	15,7	14,8	21,7	14,8	3,53
opinions about sellers on online auction service	2012	30,4	23,8	29,2	13,5	3,1	2,94
	2008	Not asked					N/A
opinions about sellers on comparison shopping service	2012	25,9	19,0	30,1	18,0	6,9	3,17
	2008	Not asked					N/A
other service	2012	73,9	6,8	11,5	4,7	3,1	3,16
	2008	81,4	3,5	8,6	3,4	3,2	3,34

As for 2012 study there were four new ISA added to the set, this fall can be partly due to more activities to choose during decision-making process. Also the range of services available through price comparison sites increased substantially. Such websites are used not only to compare prices, drifting rather toward comprehensive places to compare products and opinions about them or sellers (e.g popular in Poland website Ceneo.pl). Growth of previously not available online reviews sites (in both types product-oriented like Znam.to in Poland, or seller-oriented (like Opineo.pl for example) can influence this situation.

Highest average frequency of usage has comparison shopping services – used more often to find opinions about sellers than to find prices. Nota bene – qualitative investigation conducted by authors in 2012 revealed typical scenario of comparison shopping services: most of FGI participants were using them to find about 3-5 online stores with possibly lowest prices for selected product, and next assess their rating produced by comparison shopping service and customers opinions left. The choice typically was online store with best rating from those 3-5 "candidates". If any pre-chosen places seemed to be enough reliable – consumer went step by step for higher price, stopping with seller having required perceived reliability assessed on the base of customer satisfaction grades, number of transactions recorded by comparison service ect. Other services mentioned by consumers as used frequently were mostly global online consumer reviews sites focused on travel (like i.e. Tripadvisor.com or Holidaycheck.com – with their country focused mutations).

In conclusion – observed tendency is that more respondents declare ISA usage over time, but average frequency of such usage falls. This can be also an effect of approaching the stage when "late majority" of internet users starts to use ISAs, and uses them less frequently than "early adopters" or "early majority" groups.

3. Selected factors influencing ISAs' usage

To find possible covariates of ISA usage the univariate analysis of variance (UNIANOVA procedure) has been performed (Table 2). This procedure provides regression analysis and analysis of variance for one dependent variable by one or more factors and allows to find possible interactions of factors.

Table 2

Tests of Between-Subjects Effects for Aggregated ISA usage frequency

Dependent variable: Aggregated ISA usage frequency Variance source:	Type III Sum of Squares	df	Mean Square	F	Signif.
Corrected Model	110,776[a]	94	1,178	2,169	,000
Intercept	878,126	1	878,126	1616,068	,000
AGE_GROUP[b]	**8,718**	**5**	**1,744**	**3,209**	**,007**
VC_RISK[c]	1,857	2	,929	1,709	,182
PIIT_GROUP[d]	**2,858**	**2**	**1,429**	**2,630**	**,073**
GENDER[e]	,316	1	,316	,582	,446
AGE_GROUP * VC_RISK	5,321	10	,532	,979	,460
AGE_GROUP * PIIT_GROUP	5,712	10	,571	1,051	,398
AGE_GROUP * GENDER	,554	5	,111	,204	,961
VC_RISK * PIIT_GROUP	**6,149**	**4**	**1,537**	**2,829**	**,024**
VC_RISK * GENDER	,143	2	,071	,131	,877
PIIT_GROUP * GENDER	,025	2	,012	,023	,978
AGE_GROUP * VC_RISK * PIIT_GROUP	9,789	15	,653	1,201	,264
AGE_GROUP * VC_RISK * GENDER	2,721	8	,340	,626	,756
AGE_GROUP * PIIT_GROUP * GENDER	3,937	9	,437	,805	,612
VC_RISK * PIIT_GROUP * GENDER	2,321	4	,580	1,068	,371
AGE_GROUP * VC_RISK * PIIT_GROUP * GENDER	8,005	13	,616	1,133	,326
Error	488,491	899	,543		
Total	5358,812	994			
Corrected Total	599,268	993			

a – R Squared = ,185 (Adjusted R Squared = ,100)
b – AGE_GROUP – Age in 6 groups
c – VC_RISK – Perceived risk of virtual channel usage - 3 groups: low, average, high
d – PIIT_GROUP – Personal Innovativeness in domain of IT - 3 groups: low, average, high
e – GENDER – 2 groups

Three factors has been used in this case: two demographic variables – gender and age, as well as two psychographic ones – perceived risk of virtual channel usage (VC_RISK) and personal innovativeness in domain of IT (PIIT). This produced 2 × 6 × 3 × 3 factorial design. There is the need to note low number of participants over 60yo in the sample.

Age plays important role in explaining aggregated ISA usage – generally interactive shopping aids usage frequency diminishes with age significantly (Table 3), but it not differs significantly for both genders. Also perceived risk of virtual channel usage not explains ISA usage frequency (Table 3).

Table 3

Aggregated ISA usage frequency for different factors (estimated)

Factor	Groups	Age group (yo)					
		16-24	25-34	35-44	45-59	60-64	65-74
Gender	Women	2,26	2,28	2,19	2,11	1,57	1,83
	Men	2,29	2,32	2,24	2,04	2,05	1,80
Perceived risk of virtual channel usage	low	2,36	2,28	2,35	2,22	1,79	2,27
	average	2,27	2,28	2,24	1,96	1,96	1,29
	high	2,21	2,35	2,05	2,04	1,61	1,66
Personal innovativeness in domain of IT	low	2,11	2,02	2,00	1,95	1,86	1,78
	average	2,25	2,17	2,14	2,04	1,83	1,77
	high	2,48	2,70	2,50	2,23	1,67	2,00

Personal innovativeness in domain of IT (PIIT) influence is significant with $0,05 < p < 0,1$. This suggests statistical tendency – high PIIT means more frequent ISA usage, and conversely. There is also one significant interaction: perceived risk of virtual channel usage and PIIT working jointly are influencing significantly ISA usage (Figure 1). For persons with high personal innovativeness in domain of IT the higher perceived risk of virtual channel usage the slightly higher ISA usage frequency – so for high PIIT increase of perceived risk level boosts ISA usage, and different situation is for low PIIT – low PIIT and low perceived risk of virtual channel are favoring ISA usage, but the higher perceived risk for low PIIT the less often ISAs will be used for such consumer.

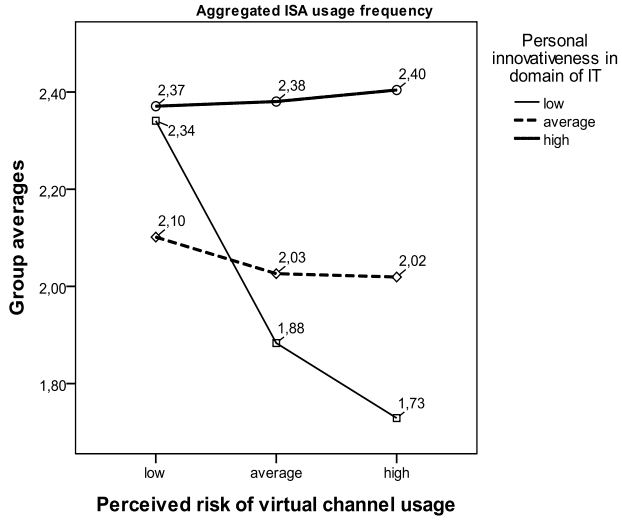

Figure 1. Interaction between perceived risk of virtual channel usage and personal innovativeness in domain of IT

This leads to conclusion that usage of interactive shopping aids reduces risks of shopping online mostly when person is enough experienced in Internet usage and enough innovative in IT domain. For less innovative persons high perceived risk of buying online will lead rather to another cognitive difficulties with ISA usage – in this case many persons will not use ISA nor buy online because of too high perceived risk.

So answering research question 1 (*RQ1*) it is possible to say that main role in frequency of ISA usage plays age. Other important factor is interaction between PIIT and perceived risk connected with virtual channel purchases. Any of both interacting variables is not significantly influencing ISA usage alone.

4. Preliminary model explaining ISA usage

One of paper objectives was to build preliminary model explaining ISA usage on aggregate level. To do so, previous authors research and literature have been reviewed. In effect, four group of constructs were chosen as potential independent variables explaining ISA usage on aggregated level (declared frequency of use for each ISA was aggregated to ISA_USE variable). First group consists of three from 10 used consumer decision-making styles: NFC – novelty-fashion consciousness, COMP – compulsive orientation toward consumption and PVC – price-value consciousness. Second group is formed by some virtual channel characteristics: virtual channel savings (VC_SAV), virtual channel post-purchase satisfaction (VC_PPS), and aggregated virtual channel perceived risk (VC_RISK). ISA usage is also influenced by use of virtual channel to gather shopping information (VC_IU) and more broad construct – personal innovativeness in domain of IT (PIIT). Structure of path model and basic fit statistics are shown on Figure 2.

Estimated path model fits the data quite well, and has at least acceptable fit statistics (Figure 2). Although specified factors are explaining about 35% of ISA usage variance, perceived risk of virtual channel purchases is the only predictor not having significant path coefficients. So it is not an important cause of ISA usage. Main influence on ISA usage has in this model use of virtual channel to gather shopping information (VC_IU) with own predictors acting indirectly. Variance part explained by virtual channel savings (VC_SAV), and personal innovativeness in domain of IT (PIIT) is much more smaller. It is also important to note that seven variables explaining VC_IU explain only 10% of its variance – so there are other important predictors of VC_IU not included in the model.

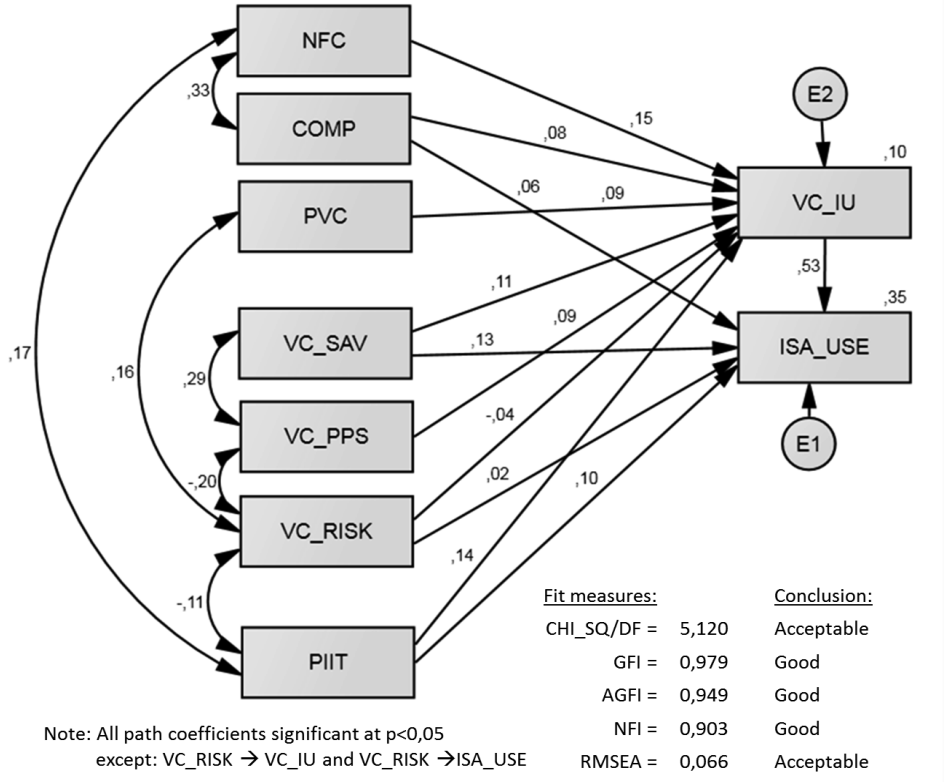

Figure 2. Path model explaining factors influencing ISA usage

Answer for *RQ2* is negative: ISA usage cannot be explained in terms of virtual channel usage risk, and ISA usage is not a common and effective strategy for consumer to reduce virtual channel buying risk.

Conclusion

ISA usage becomes more popular in Poland last years, although frequency of particular ISA usage falls in average. Analysis leads to statement that main role in explaining frequency of ISA usage plays age, as well as interaction between PIIT and perceived risk connected with virtual channel purchases. Any of both interacting variables is not significantly influencing ISA usage alone. Unfortunately ISA usage cannot be explained in terms of virtual channel usage risk, and ISA us-

age is not a common and effective strategy for consumer to reduce virtual channel buying risk. Further studies are needed to explore in greater detail this interesting topic, for example to build model of ISA usage better explaining it and its covariates.

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INTERACTIVE SHOPPING AIDS USAGE BY CONSUMERS AS A WAY TO REDUCE SHOPPING RISK

Summary

Interactive shopping aids (ISA) became widely used by consumers in recent years. Paper presents results from two samples: conducted in 2012 and 2008. Some direct comparisons are made. Declared frequency of ISA usage was the base for analysis of demographic and psychographic variables influence on it with possible interactions. There was also path model utilized. Main findings include: growth of ISA usage popularity with fall of average frequency for particular ISA; age as main factor explaining ISA usage.

Keywords: consumer behavior, purchasing process, shopping risk