Trust and Product/Sellers Reviews as Factors Influencing Online Product Comparison Sites Usage by Young Consumers

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Paper describes young consumers' behaviour connected with online product comparison sites usage as an example of online decision shopping aids. Authors' main goal is to check whether or not such factors as: previous experience in such sites usage, personal innovativeness in domain of information technology – PIIT, and particularly cognitive trust (in several subdimensions), as well as affective trust toward online product comparison site, influence purchase intention via mentioned sites (acting as intermediaries in online sales channel), and anticipated satisfaction from choice made by consumer. Also indirect influence of users' opinions about product and sellers on mentioned constructs has been researched. Study on effective sample of 456 young consumers with data collected through CAWI questionnaire confirmed reliability and validity of measurement scales. Path model estimated via PLS-SEM confirmed most hypotheses settled, particularly confirming strong positive relationships between cognitive trust (mostly in competence) on affective trust, and later on purchase intention and choice satisfaction. Product and sellers reviews were partially mediating some of those relationships.

Key Words: information technology, market, online product comparison sites usage, trust, products/sellers reviews, purchase intention
JEL Classification: O33, D12, C39

Introduction

Common access to online shopping by consumers changed their buying habits during last 10–15 years. The share of online retail spending (on goods) increases over the time, breaking on most mature markets as United States, United Kingdom or Germany the barrier of 10% share in total retail recently, with UK being the leader with mentioned share

about 13.5%, and growth rate of online sale in Europe by 18.4% between 2013 and 2014 (see http://www.retailresearch.org/onlineretailing.php). This involves a large number of decisions to find products and sellers online. Although finding online retailer by choice the largest brands (like Amazon) or places where someone bought previously with satisfaction is common, finding the best deal – often with help of product comparison sites – is another popular option.

Contemporary online product comparison sites offer possibilities to compare products using many criterions regarding product features and opinions about them (sometimes also so called 'trusted opinions' of real and not anonymous for the site customers who bought particular product), as well as prices and sellers' credibility (typically also based on customers opinions). Product comparison sites evolved form more simple price comparison engines introduced nearly 20 years ago.

General mechanics of product comparison site is to aggregate information from product comparison agent or bot, that is configured to gather product information (such as actual price, product availability, product description etc.) from online vendors and/or product information databases, usually on agreement via programming interface, or parsing HTML data from online vendors. In this paper approach differentiating product comparison agent from product comparison site is proposed, as typical consumer interacts with product comparison site, typically known for him/her, and is not interested about underlying technology allowing the site to present demanded information on request – product comparison agent should be transparent to the comparison site user. Aggregated information awaits online shopper request and is revealed to him/her usually in form of ranking on request. Interacting with product comparison site consumers create some traces of their behaviour, that are valuable for online vendors for their marketing activities (figure 1).

As the exact rules of product information aggregation and presentation by product comparison site may not be known to the consumer, the consumer should believe that such site acts benevolently for him/her. Trusting beliefs that business model of such service is based on customer satisfaction, and not on presenting distorted data on behalf of sellers paying higher commission or advertising within service, are important part of trust as a whole, and trust to product comparison site is important factor of such service usage. Modern product comparison sites are also rich in product and sellers ratings or reviews, their presence and content can mediate relationship between trust and shopping process outcomes, as described later in the paper.

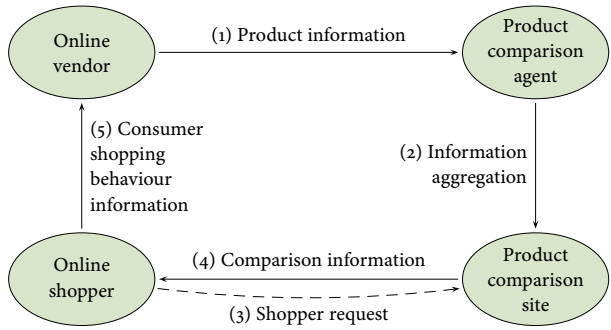

FIGURE 1 Place of Product Comparison Sites in e-Commerce Ecosystem (numbers represent steps of information flows between ecosystem members; adapted from Wan, Menon, and Ramaprasad 2007, 66)

Young consumers are more innovative toward information technology usage. They also are using online decision shopping aids including product comparison sites, and connected with them mobile tools, more often and in more extensive way (Mącik and Nalewajek 2013), so studying this group behaviour can be useful to make predictions by analogy for consumers later accepting new technologies. Previous research also suggests the power of online opinions and reviews for this group of consumers (Nalewajek and Mącik 2013).

Although the influence of online reviews on purchasing behaviour has received empirical support from a numerous studies in the information systems and consumer behaviour literature (e.g., Forman, Ghose, and Wiesenfeld 2008; Khammash and Griffiths 2011), in most studies the effect of positive and negative reviews for particular e-commerce site have been studied, and product reviews have been left from detailed consideration. Particularly negative reviews are believed to have a stronger effect on consumer behaviour than positive ones (Park and Lee 2009), as they are seen as more diagnostic and informative (Lee, Park, and Han 2008). Typically set of product reviews and seller opinions available for consumer via online product comparison sites are a mix of positive and negative reviews, this situation is considered in literature as inconsistent reviews setting (Tsang and Prendergast 2009). For instance, a consumer easily can find positive review stating that an online retailer is very helpful in answering consumers' questions or doubts, and another review being exactly opposite to the first one (negative review). To understand how consumers make decision in this circumstance, particularly when both types of reviews are coming from the same time (and differences cannot be attributed to improvement or decrease in service quality over time), it

is important to investigate the influence of inconsistent reviews, to check whether the negative information in inconsistent reviews is overemphasized (Zhang, Cheung, and Lee 2014), and whether or not decreases purchase intention at particular site, or leads to change previously chosen retailer.

In this study focus lies on the extent of usage of reviews that are mediating trust toward product comparison site and shopping outcomes, under assumption that typically consumer is exposed on mixed reviews – both positive and negative.

Trust-Based Acceptance Model

Numerous research show that online trust is a key driver for the success of e-commerce (Cheung and Lee 2006; Hong and Cho, 2011), and consumer trust is believed to have essential role in successful operation of online retailer (Kim and Park 2013). Many studies researching consumer trust toward e-commerce site are following Komiak and Bensabat (2006) trust-based acceptance model built upon well-known and widely used in e-commerce studies theory of reasoned action (TRA) (Hoehle, Scornavacca, and Huff 2012; Komiak and Benbasat 2006). According to TRA individuals' behaviour is predicted by their behavioural intention, while behavioural intention is formed as an effect of attitude, beliefs, and subjective norms (Fishbein and Ajzen 1975). Those connections are causal relationships, so can be modelled using SEM approach.

Another concept to include trust in e-commerce research is exploring antecedents of trust toward online seller in the context of trust–risk–benefit triangle explaining intention to buy online (Kim, Ferrin, and Rao 2008). In this approach trust is one dimensional construct opposite to risk, and both of them are explained by set of the same factors varying in sign of influence. Trust in this research is mostly an effect of perceived privacy protection and website information quality (Kim, Ferrin, and Rao 2008).

More sophisticated and relevant for presented research is approach proposed by Komiak and Benbasat (2006) including studying different types of trust. They proposed mentioned trust-based acceptance model to understand the adoption of online recommendation agents. Komiak and Benbasat (2006) examined two types of trust in the model: cognitive trust and emotional trust. Cognitive trust is conceptualized as trusting beliefs, while emotional (affective) trust is rather a form of trusting attitude. In online environments, consumers often affectively evaluate trust-

ing behaviour. A high level of emotional trust suggests that consumers have favourable feelings toward performing the behaviour. The trust-based acceptance model highlights that cognitive trust affects emotional trust, which further leads to individuals' adoption intention (Komiak and Benbasat 2006). This is convergent with TRA approach when adoption process is in sequence of belief 'attitude' intention, although subjective norm is not considered in trust-based acceptance model as adoption behaviour is considered as voluntary rather than mandatory (Komiak and Benbasat 2006).

Cognitive trust can be analysed in three, usually correlated, main categories: competence, benevolence, and integrity as suggest McKnight, Choudhury, and Kacmar (2002). Trust in competence refers to the extent to which consumers perceive an online retailer as having skills and abilities to fulfil what they need (Mayer, Davis, and Schoorman 1995). Trust in benevolence is consumers' perception that the retailer will act in their interest (Hong and Cho 2011). Trust in integrity refers to consumers' perception about honesty and promise-keeping by online retailer (McKnight, Choudhury, and Kacmar 2002). For proposed study all mentioned three dimensions of cognitive trust are researched in the context of product comparison sites and their usage by consumers.

Affective (emotional) trust captures consumers' affective evaluation of performing trusting behaviour (Sun 2010). Relatively high level of affective trust suggests having favourable feelings by consumer toward performing shopping behaviour. Including emotional dimension of trust toward online vendor or intermediary such as product comparison site may lead to oversimplified analysis of consumers' behavioural decision (Komiak and Benbasat 2006).

The trust-based acceptance model assumes that cognitive trust (including its sub-dimensions) affects emotional (affective) trust, and the latter leads to individual adoption intention. Subjective norm present in theory of reasoned action (TRA) is dropped in this case, as consumer adoption behaviour is in most cases voluntary in the context of internet shopping aids usage, as it is possible not to use them, or choose the tool from wide set of possibilities, during decision-making online. Miller and Hartwick (2002) suggest that subjective norm is more important in mandatory rather than voluntary settings. In effect the trust-based acceptance model follows process of belief → attitude → intention in the form cognitive trust → affective trust → behavioural intention for explaining consumer online shopping behaviour (Zhang, Cheung, and Lee 2014, 90).

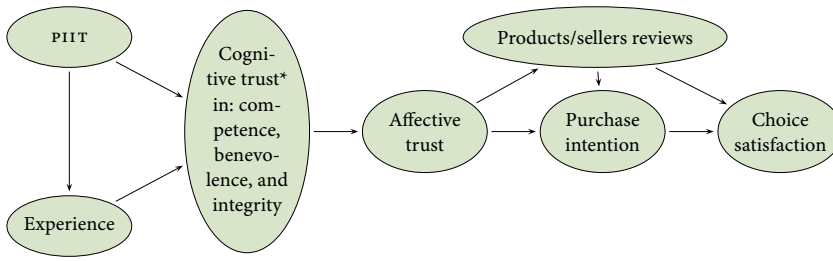

FIGURE 2 Conceptual Research Model (* for online product comparison site)

Research Model and Hypotheses

Previously mentioned concepts, particularly Komiak and Benbasat (2006) approach, putted in context of online product comparison sites usage, were leading to propose and validate conceptual model shown on figure 2.

In this model previous experience in online product comparison sites usage and personal innovativeness in domain of information technology – PIIT (Agarwal and Prasad 1998) are predictors for cognitive trust for online product comparison site. PIIT influences cognitive trust directly and indirectly, trough experience in online product comparison site usage. Cognitive trust is measured in three sub-dimensions: trust in competence, trust in benevolence and trust in integrity – as suggested by McKnight, Choudhury, and Kacmar (2002). Cognitive trust (each of three dimensions) influences affective trust, and later purchase intention – similarly as in Komiak and Benbasat (2006) research. Purchase intention leads to buying behaviour (analogically to the usage intention and actual use relationship in classical TAM), but as there were no actual purchase in this research, anticipated satisfaction from choice made is substituting the real purchase behaviour and satisfaction. The influence of affective trust on purchase intention and on choice satisfaction is mediated by products and sellers reviews available for consumer within product comparison site. This way the original trust-based adoption model proposed by Komiak and Benbasat (2006) is extended by adding selected antecedents of cognitive trust, and also by introducing choice satisfaction as final explained construct, with products/sellers reviews mediating consumer's decision-making process outcomes.

Following hypotheses have been formulated for this research:

H1 *Personal Innovativeness in domain of Information Technology (PIIT) will positively affect cognitive trust to product comparison site.*

H1a *PIIT will positively influence cognitive trust in competence to product comparison site.*

H1b *PIIT will positively influence cognitive trust in benevolence to product comparison site.*

H1c *PIIT will positively influence cognitive trust in integrity to product comparison site.*

H2 *Personal Innovativeness in domain of Information Technology will indirectly positively affect cognitive trust to product comparison site trough previous consumer experience with product comparison site.*

H3 *Previous consumer experience with product comparison site usage will positively affect cognitive trust to product comparison site.*

H3a *Previous consumer experience with product comparison site usage will positively influence cognitive trust in competence to product comparison site.*

H3b *Previous consumer experience with product comparison site usage will positively influence cognitive trust in benevolence to product comparison site.*

H3c *Previous consumer experience with product comparison site usage will positively influence cognitive trust in integrity to product comparison site.*

H4 *Cognitive trust sub-dimensions are interconnected.*

H4a *Cognitive trust in competence will influence cognitive trust in benevolence.*

H4b *Cognitive trust in benevolence will influence cognitive trust in integrity.*

H4c *Cognitive trust will positively affect affective trust to product comparison site.*

H5 *Cognitive trust will positively affect affective trust to product comparison site.*

H5a *Cognitive trust in competence will positively influence cognitive trust in competence to product comparison site.*

H5b *Cognitive trust in benevolence will positively influence cognitive trust in competence to product comparison site.*

H5c *Cognitive trust in integrity will positively influence cognitive trust in competence to product comparison site.*

H6 *Affective trust to product comparison site will positively affect purchase intention.*

H7 *Purchase intention will positively affect anticipated choice satisfaction.*

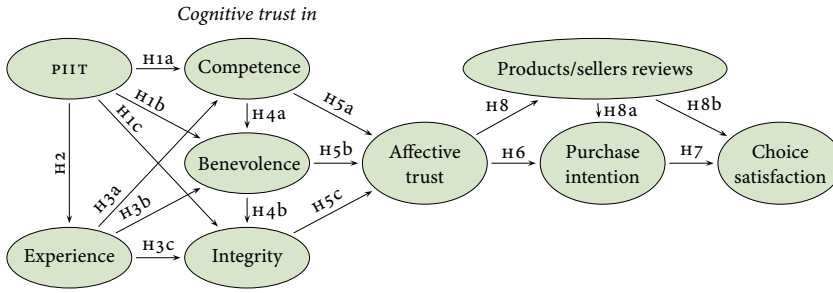

FIGURE 3 Hypothesised Relationships in Research Model

H8 *Product and sellers reviews available for consumer from product comparison site will mediate relations between affective trust and shopping process outcomes.*

H8a *Product and sellers reviews available for consumer from product comparison site will mediate the relationship between affective trust and purchase intention.*

H8a *Product and sellers reviews available for consumer from product comparison site will mediate the relationship between affective trust and anticipated choice satisfaction.*

Research model derived from conceptual one has been assessed via structural equation modelling approach utilizing PLS-SEM.

Sample and Measures

SAMPLE

Data have been collected through CAWI questionnaire with e-mail invitation sent to authors students and their peers that returned 461 responses from 575 sent invitations, giving response rate of 80.2%. Study participants were motivated to respond by giving course credit (bonus points for activity if a student responds and effectively invites one other person – points given have value of 3% of maximum grade for the course), and also the promise of presenting preliminary study results on final lecture in consumer behaviour has been given. For analysis 456 responses have been qualified as complete and usable.

In effect sample consists of 60.1% women and 39.9% men. Mean age of participants is 24.6 years with standard deviation of 5.3 years (range: 18–36 years old, median: 23 years). 1/3rd of participants are inhabitants of rural areas. All participants must be active internet users and make at least one online purchase during a year prior study. Sample structure

TABLE 1 Scales Used in Study

Construct	(1)	(2)	(3)	(4)
Personal Innovativeness in domain of Information Technology	PIIT	(Agarwal and Prasad 1998)	translation	4
Consumer experience in product comparison sites usage b	EXP	Own	N/A	9
Cognitive Trust in Competence	CT_Competence	(McKnight, Choudhury, and Kacmar 2002)	travestation	4 (3)[a]
Cognitive Trust in Benevolence	CT_Benevolence	(McKnight, Choudhury, and Kacmar 2002)	travestation	4 (3)[a]
Cognitive Trust in Integrity	CT_Integrity	(McKnight, Choudhury, and Kacmar 2002)	travestation	4 (3)[a]
Affective (Emotional) Trust	Emo_Trust	(Komiak and Benbasat 2006)	reconstruction	4
Purchase Intention	Purchase_Int	(Gefen, Karahanna, and Straub 2003)	reconstruction	4
Choice Satisfaction[b]	Choice_Satisf	Own	N/A	4
Product Reviews[b]	Prod_Reviews	Own	N/A	2
Sellers Reviews[b]	Sellers_Reviews	Own	N/A	2

NOTES Column headings are as follows: (1) short name, (2) source of items, (3) level of adaptation, (4) number of items. [a] One item dropped due to low factor loading. [b] Scale items presented in table 8.

regarding to gender and age is close to population of full-time and part-time students of public university located in South-East part of Poland, where data have been collected.

MEASURES

Items to measure constructs used in the research have been adapted mainly from previous studies published, and scales prepared by authors. As questionnaire language was Polish, this required to translate and culturally adapt (by authors) scales written originally in English, including reconstruction where needed. In effect used scales are derived from original measures. Basic data about used scales provides table 1.

Data analysis for this study has been performed using SmartPLS 3.2

TABLE 2 Reliability of Measures – Cronbach's Alpha

Constructs	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CT_Benevolence	0.713	0.710	0.030	24.150	0.000	0.645	0.763
CT_Competence	0.732	0.730	0.027	26.797	0.000	0.672	0.780
CT_Integrity	0.777	0.775	0.023	33.312	0.000	0.726	0.817
Choice_Satisf	0.778	0.777	0.023	33.255	0.000	0.727	0.818
EXP	0.928	0.928	0.006	155.309	0.000	0.915	0.938
Emo_Trust	0.802	0.801	0.020	39.243	0.000	0.759	0.838
PIIT	0.821	0.820	0.015	56.054	0.000	0.790	0.847
Prod_Reviews	0.788	0.788	0.025	31.153	0.000	0.736	0.835
Purchase_Int	0.797	0.796	0.021	37.941	0.000	0.752	0.833
Sellers_Reviews	0.835	0.834	0.021	39.706	0.000	0.791	0.872

NOTES Column headings are as follows: (1) original sample; bootstrap estimates: (2) sample mean, (3) standard error, (4) *t*-statistics, (5) *p*-values; bootstrap bias corrected 90% confidence interval: (6) low, (7) high.

TABLE 3 Reliability of Measures – Composite Reliability (CR)

Constructs	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CT_Benevolence	0.839	0.838	0.014	60.961	0.000	0.808	0.863
CT_Competence	0.849	0.848	0.013	65.332	0.000	0.821	0.872
CT_Integrity	0.871	0.870	0.012	74.224	0.000	0.845	0.891
Choice_Satisf	0.857	0.856	0.013	66.032	0.000	0.829	0.880
EXP	0.940	0.940	0.005	196.583	0.000	0.929	0.948
Emo_Trust	0.871	0.870	0.012	75.155	0.000	0.847	0.892
PIIT	0.882	0.882	0.009	102.417	0.000	0.862	0.897
Prod_Reviews	0.904	0.904	0.010	87.452	0.000	0.883	0.923
Purchase_Int	0.868	0.867	0.012	72.980	0.000	0.843	0.889
Sellers_Reviews	0.924	0.923	0.009	103.049	0.000	0.905	0.940

NOTES Column headings are as follows: (1) original sample; bootstrap estimates: (2) sample mean, (3) standard error, (4) *t*-statistics, (5) *p*-values; bootstrap bias corrected 90% confidence interval: (6) low, (7) high.

software (see www.smartpls.com), as most of measurement variables were not normally distributed. Bootstrap precedure with 10000 repetitions (resampling with replacement, sample size equal of original sample size – 456 observations) has been utilised to get inference statistics for measures and model.

TABLE 4 Convergent Validity of Measures – Average Variance Extracted (AVE)

Constructs	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CT_Benevolence	0.635	0.634	0.023	27.112	0.000	0.585	0.678
CT_Competence	0.652	0.652	0.023	28.768	0.000	0.606	0.695
CT_Integrity	0.692	0.691	0.022	31.377	0.000	0.646	0.732
Choice_Satisf	0.600	0.599	0.025	23.880	0.000	0.549	0.647
EXP	0.636	0.636	0.019	32.962	0.000	0.594	0.670
Emo_Trust	0.628	0.627	0.024	26.375	0.000	0.582	0.673
PIIT	0.656	0.654	0.017	37.687	0.000	0.618	0.686
Prod_Reviews	0.825	0.825	0.017	48.025	0.000	0.791	0.858
Purchase_Int	0.622	0.621	0.024	25.964	0.000	0.574	0.667
Sellers_Reviews	0.858	0.858	0.015	55.580	0.000	0.827	0.887

NOTES Column headings are as follows: (1) original sample; bootstrap estimates: (2) sample mean, (3) standard error, (4) *t*-statistics, (5) *p*-values; bootstrap bias corrected 90% confidence interval: (6) low, (7) high.

RELIABILITY AND VALIDITY OF MEASURES

Reliability of measures in this study has been assessed by Cronbach's Alpha coefficient and Composite Reliability (CR) measure, as they represent lower and upper boundaries of true scale reliability respectively (Henseler, Ringle, and Sarstedt 2014). Using both criterions reliability of all constructs meets typical requirements – values of Alpha and CR are all over 0.7 (Hair, Ringle, and Sarstedt 2013, 7) – tables 2 and 3. In most following tables information structure includes original sample estimates, bootstrap estimates including sample mean and standard error from 10000 bootstrap samples with corresponding *t*-test statistic and its *p*-value, as well as 90% bootstrap bias-corrected confidence interval. These values are reported to confirm that results are valuable in terms of meeting typical criteria of reliability and validity.

Convergent validity of used measures is very good – all constructs are meeting criterion of Average Variance Extracted (AVE) over value of 0.5 as suggested by Fornell and Larcker (1981) – table 4.

Discriminant validity of used measures is also good. The Fornell-Larcker Criterion stating that AVE for each construct should be higher from all squared correlations between construct and other measures (Fornell and Larcker 1981) is met for all constructs beside one (pair: Emotional Trust and Choice Satisfaction) – table 5 (see also note, as in table this criterion is reported in alternative form).

TABLE 5 Discriminant Validity of Measures – Fornell-Larcker Criterion

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	0.797									
(2)	0.657	0.807								
(3)	0.691	0.700	0.832							
(4)	0.538	0.693	0.556	0.774						
(5)	0.106	0.210	0.179	0.225	0.798					
(6)	0.609	0.746	0.633	0.790	0.252	0.792				
(7)	0.042	0.117	0.117	0.073	0.307	0.035	0.810			
(8)	0.121	0.185	0.121	0.247	0.316	0.263	0.084	0.908		
(9)	0.500	0.596	0.503	0.738	0.285	0.739	0.062	0.224	0.789	
(10)	0.202	0.209	0.140	0.283	0.311	0.229	0.211	0.570	0.211	0.926

NOTES Column/row headings are as follows: (1) CT_Benevolence, (2) CT_Competence, (3) CT_Integrity, (4) Choice_Satisf, (5) EXP, (6) Emo_Trust, (7) PIIT, (8) Prod_Reviews, (9) Purchase_Int, (10) Sellers_Reviews. Numbers on matrix diagonal are square roots from AVE for each construct; numbers off-diagonal are correlations between constructs, this is alternative form to report Fornell-Larcker Criterion (Henseler et al. 2014, 117).

Results

On the base or conceptual model shown on figure 1 and initial data analysis path model presented on figure 4 has been estimated using Smart PLS 3.2 software.

Initial checks led to exclude from final model direct relationships between PIIT and any of cognitive trust constructs – there are no valid direct relationships between them, and PIIT influence on other constructs in this model is only indirect, via consumer experience with product comparison sites. Also path between consumer experience and cognitive trust in benevolence, as well as influence of product/sellers reviews on purchase intention have been dropped from the same reason. Other changes include adding direct relationship between cognitive trust in integrity and anticipated choice satisfaction. It has been also assumed that cognitive trust constructs are interconnected, so cognitive trust in competence influences trust in benevolence, and trust in benevolence is connected with trust in integrity. Table 6 presents path coefficients values in original sample and inference statistics for paths obtained via bootstrapping. Model exhibit reasonable fit – proportion of variance explained, measured with R-squared statistics is over 0.5 for main explained variables, particularly 0.591 for Emotional Trust and 0.605 for Choice Satis-

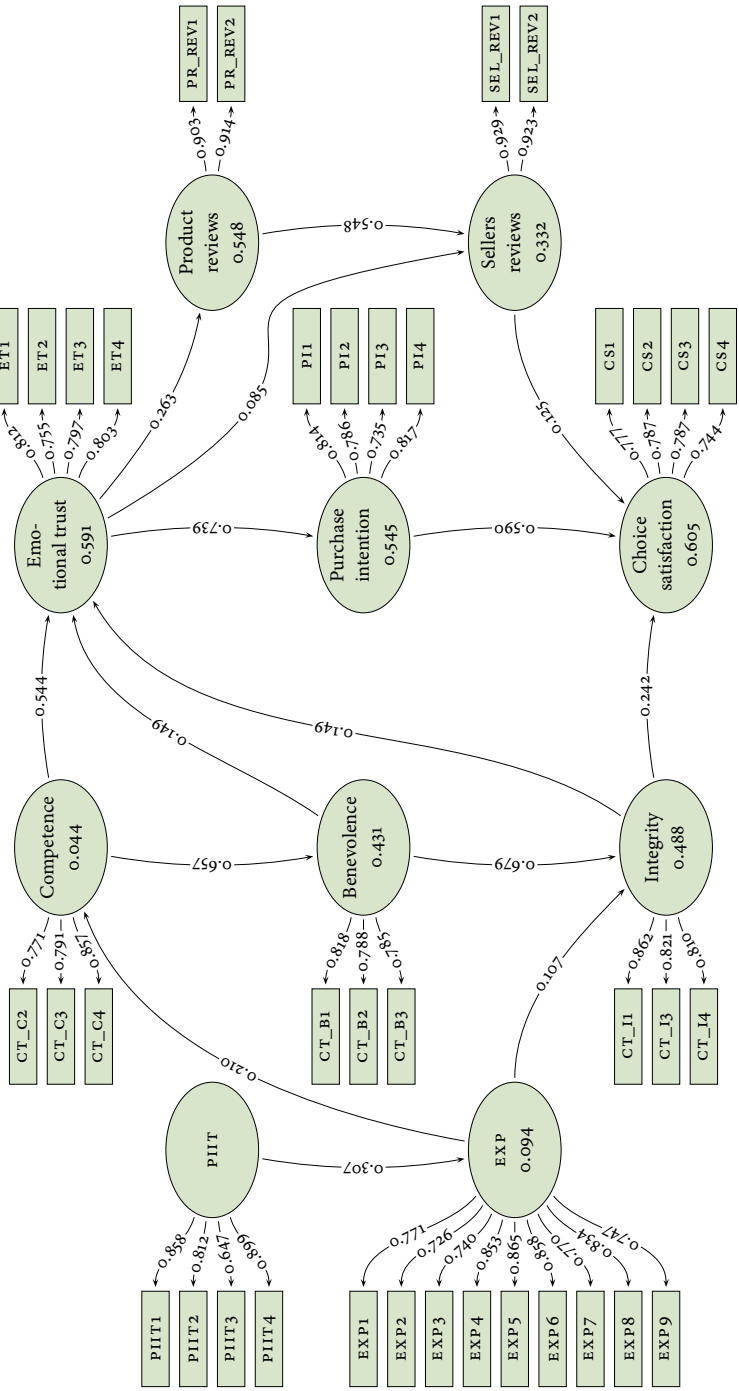

FIGURE 4 Path Model (final form; values in dark grey ovals representing latent variables are *R*-square values for this constructs)

TABLE 6 Path Coefficients in Estimated Model

Paths (direct effects)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CT_Benevolence → CT_Integrity	0.679	0.678	0.032	21.090	0.000	0.613	0.737
CT_Benevolence → Emo_Trust	0.149	0.149	0.053	2.828	0.005	0.047	0.255
CT_Competence → CT_Benevolence	0.657	0.657	0.037	17.967	0.000	0.585	0.727
CT_Competence → Emo_Trust	0.544	0.543	0.046	11.943	0.000	0.450	0.630
CT_Integrity → Choice_Satisf	0.242	0.240	0.042	5.776	0.000	0.156	0.320
CT_Integrity → Emo_Trust	0.149	0.149	0.049	3.034	0.002	0.055	0.246
EXP → CT_Competence	0.210	0.213	0.051	4.101	0.000	0.116	0.317
EXP → CT_Integrity	0.107	0.108	0.034	3.126	0.002	0.043	0.178
Emo_Trust → Prod_Reviews	0.263	0.264	0.048	5.481	0.000	0.172	0.359
Emo_Trust → Purchase_Int	0.739	0.739	0.029	25.595	0.000	0.685	0.796
Emo_Trust → Sellers_Reviews	0.085	0.084	0.040	2.094	0.036	0.005	0.163
PIIT → EXP	0.307	0.313	0.046	6.618	0.000	0.233	0.414
Prod_Reviews → Sellers_Reviews	0.548	0.549	0.038	14.354	0.000	0.474	0.623
Purchase_Int → Choice_Satisf	0.590	0.592	0.044	13.456	0.000	0.510	0.679
Sellers_Reviews → Choice_Satisf	0.125	0.125	0.032	3.886	0.000	0.063	0.189

NOTES Column headings are as follows: (1) original sample; bootstrap estimates: (2) sample mean, (3) standard error, (4) *t*-statistics, (5) *p*-values; bootstrap bias corrected 90% confidence interval: (6) low, (7) high.

faction. Also SRMR (Square Root of Mean Residuals) is low. SRMR value of 0.039 that is less than suggested 0.09 by (Iacobucci 2010, 97) confirming reasonable model fit to the data.

As model is quite complicated, some indirect effects are present, particularly for mediation of product and sellers reviews between affective trust and choice satisfaction. As total effect is the sum of direct effect and indirect effect(s), only direct and total effects are reported (tables 6 and 7). Indirect effect in this case is easy to calculate as the difference between total and direct effects (or as multiplication of particular path coefficients). In case of lack of direct relationship total effect equals indirect effect – such cases are italicized in table 7.

On the base of model estimation results hypotheses were assessed. There are no valid direct relationships between PIIT and any of cognitive trust constructs in final model, thus hypotheses H1a-H1c are not supported. PIIT influence on other constructs in this model is only indirect, via consumer experience with product comparison sites, that satisfies hypothesis H2. PIIT stronger indirectly influences cognitive trust in competence and integrity than in benevolence, and those influences are statistically significant (table 7).

Mentioned consumer experience influences cognitive trust in compe-

TABLE 7 Total Effects in Estimated Model

Paths (direct effects)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CT_Benevolence → CT_Integrity	0.679	0.678	0.032	21.090	0.000	0.613	0.737
CT_Benevolence → Choice_Satisf*	0.280	0.280	0.036	7.691	0.000	0.210	0.354
CT_Benevolence → Emo_Trust	0.250	0.251	0.046	5.448	0.000	0.164	0.344
CT_Benevolence → Prod_Reviews*	0.066	0.066	0.018	3.599	0.000	0.033	0.104
CT_Benevolence → Purchase_Int*	0.185	0.185	0.035	5.271	0.000	0.119	0.256
CT_Benevolence → Sellers_Reviews*	0.057	0.058	0.016	3.476	0.001	0.028	0.091
CT_Competence → CT_Benevolence	0.657	0.657	0.037	17.967	0.000	0.585	0.727
CT_Competence → CT_Integrity*	0.446	0.446	0.041	10.977	0.000	0.365	0.525
CT_Competence → Choice_Satis*f	0.437	0.439	0.034	12.678	0.000	0.376	0.510
CT_Competence → Emo_Trust	0.709	0.708	0.031	23.071	0.000	0.646	0.765
CT_Competence → Prod_Reviews*	0.186	0.187	0.034	5.478	0.000	0.120	0.254
CT_Competence → Purchase_Int*	0.523	0.524	0.036	14.349	0.000	0.454	0.595
CT_Competence → Sellers_Reviews*	0.162	0.162	0.033	4.937	0.000	0.099	0.227
CT_Integrity → Choice_Satisf	0.311	0.310	0.047	6.633	0.000	0.211	0.398
CT_Integrity → Emo_Trust	0.149	0.149	0.049	3.034	0.002	0.055	0.246
CT_Integrity → Prod_Reviews*	0.039	0.039	0.015	2.573	0.010	0.012	0.070
CT_Integrity → Purchase_Int*	0.110	0.110	0.036	3.031	0.002	0.041	0.183
CT_Integrity → Sellers_Reviews*	0.034	0.034	0.013	2.614	0.009	0.010	0.060
EXP → CT_Benevolence*	0.138	0.140	0.035	3.955	0.000	0.074	0.211
EXP → CT_Competence	0.210	0.213	0.051	4.101	0.000	0.116	0.317
EXP → CT_Integrity	0.201	0.203	0.048	4.151	0.000	0.112	0.301
EXP → Choice_Satisf*	0.125	0.127	0.031	4.012	0.000	0.070	0.192
EXP → Emo_Trust*	0.165	0.167	0.040	4.098	0.000	0.092	0.250
EXP → Prod_Reviews*	0.043	0.044	0.014	3.082	0.002	0.020	0.075
EXP → Purchase_Int*	0.122	0.124	0.031	3.904	0.000	0.066	0.188
EXP → Sellers_Reviews*	0.038	0.039	0.013	2.882	0.004	0.016	0.066
Emo_Trust → Choice_Satisf*	0.464	0.467	0.041	11.455	0.000	0.394	0.552
Emo_Trust → Prod_Reviews	0.263	0.264	0.048	5.481	0.000	0.172	0.359
Emo_Trust → Purchase_Int	0.739	0.739	0.029	25.595	0.000	0.685	0.796
Emo_Trust → Sellers_Reviews	0.229	0.229	0.046	5.007	0.000	0.143	0.318

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tence (H3a – supported) and in integrity (H3c – supported), but is not connected directly with cognitive trust in benevolence (H3b – not supported). Cognitive trust in competence strongly influences cognitive trust in benevolence (this supports H4a), and cognitive trust in benevolence connects with cognitive trust in integrity (H4b – supported). This sequence of influence is consistent with McKnight, Choudhury, and Kacmar (2002) suggestions.

TABLE 7 *Continued from the previous page*

Paths (direct effects)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PIIT → CT_Benevolence*	0.042	0.044	0.013	3.202	0.001	0.022	0.074
PIIT → CT_Competence*	0.064	0.067	0.020	3.285	0.001	0.033	0.110
PIIT → CT_Integrity*	0.062	0.064	0.019	3.271	0.001	0.032	0.107
PIIT → Choice_Satisf*	0.038	0.040	0.012	3.211	0.001	0.020	0.067
PIIT → EXP	0.307	0.313	0.046	6.618	0.000	0.233	0.414
PIIT → Emo_Trust*	0.051	0.052	0.015	3.268	0.001	0.026	0.087
PIIT → Prod_Reviews*	0.013	0.014	0.005	2.652	0.008	0.006	0.025
PIIT → Purchase_Int*	0.037	0.039	0.012	3.172	0.002	0.019	0.066
PIIT → Sellers_Reviews*	0.012	0.012	0.005	2.505	0.012	0.005	0.023
Prod_Reviews → Choice_Satisf*	0.068	0.069	0.018	3.735	0.000	0.033	0.105
Prod_Reviews → Sellers_Reviews	0.548	0.549	0.038	14.354	0.000	0.474	0.623
Purchase_Int → Choice_Satisf	0.590	0.592	0.044	13.456	0.000	0.510	0.679
Sellers_Reviews → Choice_Satisf	0.125	0.125	0.032	3.886	0.000	0.063	0.189

NOTES Column headings are as follows: (1) original sample; bootstrap estimates: (2) sample mean, (3) standard error, (4) *t*-statistics, (5) *p*-values; bootstrap bias corrected 90% confidence interval: (6) low, (7) high. * Only indirect effect.

Hypotheses H5a – H5c stating positive relationship between cognitive trust (particular sub-dimensions) on affective trust are supported, with cognitive trust on product comparison site competence having much stronger influence on affective trust than other cognitive trust constructs. Also hypotheses H6 and H7 are supported – affective trust strongly influences purchase intention, and purchase intention is positively connected with anticipated choice satisfaction. Added path for direct relationship between cognitive trust in integrity and anticipated choice satisfaction is also significant, this can be explained in following way: high cognitive trust in integrity means having trust beliefs about honesty and promise-keeping by online retailer (McKnight, Choudhury, and Kacmar 2002), in such circumstances it is easier to declare satisfaction from choice made.

In hypotheses H8a and H8b indirect influence of product and sellers reviews on relationship between affective trust and purchase intention or choice satisfaction have been hypothesized. Gathered data are suggesting – contrary to pilot study – that: products and sellers reviews mediation relationship is not confirmed for affective trust and purchase intention, not supporting hypothesis H8a. However there exists mediation of mentioned reviews on affective trust to choice satisfaction indirect relationship, supporting hypothesis H8b. In other words both review types are

TABLE 8 Scales Items

Construct	Short name	Item name	Item wording
Consumer experience in product comparison sites usage (5-point Likert-type scale)	EXP	EXP1	I can easily find the information I seek using product comparison sites and consumer e-opinions sites
		EXP2	I consider myself as an experienced user of product comparison sites, such as Ceneo.pl, Skapiec.pl[a]
		EXP3	I consider myself as an experienced user of consumer e-opinions sites, such as: Opineo.pl, Znam.to[b]
		EXP4	I use product comparison sites to compare prices
		EXP5	I use product comparison sites to compare product attributes
		EXP6	I use product comparison sites to look at the opinions about products / brands I consider as worth to buy
		EXP7	I use product comparison sites to learn about online retailers reputation
		EXP8	I use consumer e-opinions sites to look at the opinions about products / brands I consider as worth to buy
		EXP9	I use consumer e-opinions sites to learn about online retailers reputation

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influencing much stronger choice satisfaction, than (if any) purchase intention (figure 4). Also product review usage explains 1/3rd of variance of sellers review usage, much more than emotional trust directly (table 6). Partial mediation of review constructs on affective trust to choice satisfaction occurs and is significant, while affective trust and purchase intention path is not significantly mediated as it was hypothesized.

Conclusion and Limitations

Performed research generally confirms conceptual model as well as measurement reliability and validity of used constructs. Main paths of influences adopted from Komiak and Benbasat (2006): cognitive trust → affective trust → purchase intention [and anticipated choice satisfaction – as added construct] is confirmed by relatively strong positive influence. Although the effect of selected for model antecedents of cognitive trust is lower than expected, and also mediation of product/sellers review affects stronger choice satisfaction than purchase intention, own extension of Komiak and Benbasat (2006) trust-based acceptance model is promising. Also main relationships found for product comparison site usage are similar to those found in case of online retailer (Zhang, Cheung, and Lee 2014), that confirms study external validity.

Obtained results confirm possibility to relatively good explain con-

TABLE 8 *Continued from the previous page*

Construct	Short name	Item name	Item wording
Choice Satisfaction (5-point Likert-type scale)	Choice_Satisf	CS1	I think I would have been satisfied making the purchase on the basis of the suggestions from comparison site I used
		CS2	I think that the comparison site I used, would allow me to make a good choice
		CS3	I believe that through the use of the comparison site I used, I would reduce the risk of buying the wrong product
		CS4	I believe that through the use of the comparison site I used, I would reduce the risk of unreliable vendor selection
Product Reviews (4-point scale[c])	Prod_Reviews	PR_REV1	To what extent in decision-making which product to choose you have paid attention on product ratings (described as numbers, points, stars, etc.)
		PR_REV2	To what extent in decision-making which product to choose you have paid attention on product written reviews
Sellers Reviews (4-point scale[c])	Sellers_Reviews	SEL_REV1	To what extent in decision-making which product to choose you have paid attention on vendor ratings (described as numbers, points, stars, etc.)
		SEL_REV2	To what extent in decision-making which product to choose you have paid attention on vendor written reviews

NOTES In questionnaire items were worded in Polish. [a] Ceneo.pl and Skapiec.pl are product comparison sites commonly used by consumers in Poland. [b] Opineo.pl and Znam.to are consumer e-opinion sites commonly used by consumers in Poland. [c] With answer choices: 1 – 'for any of the listings,' 2 – 'only for the listing selected eventually,' 3 – 'for listings under consideration,' 4 – 'for all viewed listings.'

sumer decision-making outcomes in terms of proposed model. Enhancing known model by new constructs gave possibility to better explain product comparison site usage, and contributed new findings to the existing knowledge – particularly by emphasising the role of cognitive trust in competence for product comparison sites usage and choice satisfaction (for the last one with cognitive trust in integrity); also finding that sellers reviews are more important than product ones confirms behaviour focused on minimising the risk of dissatisfaction because of unreliable online seller activity, rather on bad choice in terms of product features – these are most important practical implications from the study.

As own measures exhibit at least required reliability, as well as convergent and discriminant validity. Replication of proposed study will be welcomed by authors – all own measures in English translation are given in table 8 (measures adopted from previous studies are easily available from literature). Comparison of future replications with this study results al-

though should be careful, as English translation of own measures have not been tested in terms of validity – study participants answered questions in Polish.

Main limitation of this study is relatively homogenous sample in terms of participants' demographic background – university students and their working or studying peers only were surveyed. This suggests that some of influences in more diversified sample – particularly in terms of age – can be different than obtained, e.g. influence of PIIT on cognitive trust should be higher and more direct for older consumers. Another possibility is to improve model is to enhance antecedents list by set of consumer decision-making styles, giving opportunity to better explain trust measures in model.

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