Abstract:
Despite being largely tackled by a manifold of sciences, perceived risk is still a rather unclear concept concerning its formation and update. In today’s economy, where poor purchase decisions are so easy to make, consumers have developed mental shields residing in actions based on perceived risk. This paper develops and tests a theory of perceived risk formation under the halo effect, based on correlation analysis in two forms: rankings individuals on their contribution to the correlations increase and partial correlations. Both internal and external halo effects were found, emerging from the perceived risk component – functional risk, financial risk, social risk, physical risk, psychological risk and time risk –, brand attitude, product category attitude, consumer’s regret, others’ regret expressed through word-of-mouth, recency, and awareness of awareness. The intricate halo that was revealed needs further attention from the scientific community in order to better delimit halo sources and, eventually, to explain its variability.

Keywords: purchase decision making, perceived risk, halo effect, correlations analysis

1. Introduction
Consumer’s universe of risk is one of the most studied subjects in the consumer behavior literature, its importance being unanimously acknowledged as a major influence in consumer’s decision process.

On a market which provides so many options, so much variety, but on the same time with confusing decision criteria, poor purchasing decisions are often made. In these conditions, consumers accumulate wide range of unfavorable experiences, from malfunctions and unworthy prices to social embarrassment and physical injuries. This negative background causes consumers’ learning and adaptation, which resides in reassurance seeking, constant suspicion, negative word-of-mouth, purchase wavering and delay. All these are fierce threats for any business, as their battle is less with their competitors and more in consumers’ minds. Notably, some firms manage to convert reassurance seeking into an opportunity by offering trustworthy combinations of attributes and additional services.

For consumers, perceived risk is a shield against unwanted outcomes that allows them to avoid poor products and to make better purchase decisions. Despite this positive role, perceived risk often tends to be overprotective, which hinders consumers from satisfying their needs, exploring the market, and getting more experience. Nonetheless, firms are the first to be interested in understanding the formation of perceived risk and its determinants in order to be able to address more specifically to consumers’ anxieties with marketing programs. Today’s knowledge on this respect consists of quite dull and simplistic theories, mostly variations of other behavioral constructs theories.

The purpose of this paper is to formulate and test a new theory that explains the formation of risk perception through the halo effect. The theory was
suggested by the results of a qualitative research and sustained by the unclear and contradictory state of knowledge with respect to this topic.

2. Theoretical background
Risk is an abstract concept that attempts to make the future foreseeable for the current state of a subject, by predicting the unfavorable circumstances and their negative impact on the risk subject. Risk hasn’t a wide-accepted unit of measurement, because of its abstract nature. The scientific literature contains several approaches towards the ways of measuring risk. Before talking about them, it’s important to distinguish between companies’ objective risk assessment – also referred to as canonical rationality (Horlick-Jones, 2005) –, for example the drop in brand equity during an economic crisis (Munteanu, 2011), and consumers’ perceived risk. The two types of risk differ not only in the risk holder – institutional or individual – but more in the types of evaluation and intentionality.

Consumer’s perceived risk was originally theorized by Bauer (1960) as the undesirable outcome that a consumer anticipates that it can follow his current actions. Mitchell (1999) divides it into two components: uncertainty about the consequences of a wrong choice and uncertainty about the outcome – still, the second one was found insignificant for any kind of goods or services (Hem, de Chernatony, and Iversen, 2003). On the same idea, Cunningham (1967) suggests the use of other 2 dimensions – the measure at risk and the probability of risk occurrence – to evaluate perceived risk. Multiplying the two figures, we get the overall perceived risk, also called mathematical hope. Furthermore, recent research (Florea and Munteanu, 2012) adds a third component to the previous two – the risk horizon – that is inversely proportional to the resulting risk, as the equation (1) shows.

\[
\sigma = f\left(\frac{p \cdot M}{h}\right) \quad (1),
\]

where: \( \sigma \) - perceived risk, \( p \) – probability of risk occurrence, \( M \) – measure at risk, \( h \) – risk horizon.

Perceived risk theory states that risk is a multidimensional concept, containing components, each with attached influence on consumer’s overall perceived risk, that vary across persons (Mitchell, 1999). This formation suggests a sort of weighted average formula for the overall perceived risk calculation, in line with the observations of Fishbein (1963), very alike to multi-attribute attitude model. Moreover, Mulino et al. (2009) find that risk aversion is not individually constant, but it varies for the same person across decision-frames. Thus, the same perceived risk can cause different reactions from a case to another.

Without providing a clear view, previous research has a special concern in revealing sources of perceived risk. In a rough way, we can distinguish between brand-related sources, product and product category related sources, individual and cultural sources.

At the brand level, the fit between a brand extension and the parent brand (Aaker and Keller, 1990; Munteanu and Pagalea, 2014) and brand quality steadiness (DelVecchio, 2000) are believed to enhance brand reliability – that is, the brand capability to reduce the perceived risk, so practically, it’s a complementary measure of risk. A consensus couldn’t be achieved in respect to the effect that the number of products affiliated with a brand has on its reliability. While most opinions (Keller, 2008; Ries and Trout, 1986) consider that a brand loses reliability every time a new extension is released – brand dilution –, DelVecchio (2000) concludes that “as the number of products associated with a brand increased, so too did consumers’ perceptions of the reliability of the brand.” This contention can drive bias into brand choice anticipation, as brand
uncertainty was proved to have a negative impact on brand evaluation and choice (Ghosh, Chakraborty, and Bunch Ghosh, 1995). Other concept used as related to brand risk is brand familiarity. “Consumers unfamiliar with a brand are less likely to try it, if it is a low involvement product. If it is a high-involvement product, they are less likely to include it in their evoked set” (Ghosh, Chakraborty and Bunch Ghosh, 1995).

Product and product category-related sources of perceived risk are both important in consumer’s decision. Product-related sources are specific for a certain option. Product category-related sources of risk are defined as “the person’s perception of the riskiness buying an average product in the product class” (Dowling and Staelin, 1994). This definition is in line with the observation of Florea and Munteanu (2012), that “consumer’s sensitivity to brand reputation depends on the product category we are having in mind” – e.g. taxi companies and exchange offices are high sensitive to brand reputation in Romania.

Perceived risk and risk aversion are often seen as cultural factors (Hofstede, 1991; Mitchell, Yamin, and Pichene, 1996; Ueltschy, Krampf, and Yannopoulos, 2004) that influences consumers’ decision-making styles (Shimp and Bearden, 1982) – it has negative influence on novelty, “fashion-conscious” orientation and “recreational and hedonistic” orientation, while positively affects “confused by overchoice” orientation (Bao, Zhou, and Su, 2003). Though, this approach has found much support in organisational context than in individual perceived risk research.

Finally, the individual uniqueness can also drive perceived risk through different ways, such as the feelings of regret and disappointment. There is contradictory evidence in the scientific literature concerning the effects of regret on the conative component of attitude. Thus, Sevdalis, Kokkinaki, and Harvey (2008) argue that the regret of a missed opportunity leads to an inaction inertia – this means that consumers feel reluctance to buy a discounted product, after they missed a larger discount. Contrariwise, other study (Raeva, Mittone, and Schwarzbach, 2010) discover that regret-affected consumers are eager to compensate the negative feeling by making a “smaller-sooner” option. Zeelenberg and Pieters (2004) find that consumers are regret averse rather than risk averse. This means that consumers don’t prefer a safe alternative to a risky one, but more, they try to minimize regret, by having either a risk-avoiding or a risk-seeking behavior. Moreover, the more self-responsibility is acknowledged by a consumer in a certain outcome, the more regret he will feel (Gilovich and Medvec, 1994). Regret has a great impact on perceived risk when it’s anticipated before the purchase (Loomes and Sugden, 1982). This may result in a serious issue if we consider that consumers often mispredict their future regret by exaggerating the foreseen feeling, as people generally underestimate their adaptive potential to new circumstances (van Bowen and Loewenstein, 2003).

3. Hypothesis and measures

Recent research (Florea, 2014) has come with the idea that perceived risk is actually formed through halo effect. This insight is the result of a qualitative research, so representativeness is not insured. Quantitative testing can provide or not enough evidence to refute the theory.

Specifically, four patterns are highlighted that can be explained using halo effect. The first consists of consumer’s struggle to justify his negative attitude towards a brand, product, or product category by identifying and exaggerating a manifold of risks associated with a certain purchase, despite no bad experiences being evoked. Thus, we are probably dealing with borrowed attitudes. The next two patterns start from a favorable attitude towards a brand or product class. This attitude drives whether to
risk denial or to acceptance, but minimization and passing-by of its harmful potential. The last pattern contains an undesired outcome caused by a brand or product class related risk event, when the risk is still valid. Consumers included in this pattern tend to overrate the magnitude or the recurrence probability to the detriment of other risks, exhibiting a tunnel vision (Florea, 2014).

Thus, both internal and external halos seem possible. Internal halo refers to the halos generated by a specific risk on the overall perceived risk, while an external halo emerges from another construct, like brand attitude. Concerning the first one, we formulate as a hypothesis:

H1: Perceived risk forms as a result of an internal halo effect.

As this type of halo is the result of a risk component, we need an operational definition of perceived risk in order to depict the concept. Different classifications are suggested in the scientific literature for the risk components, with specific and overlapping parts (Jacoby and Kaplan, 1972; Hawkins, Best and Coney, 2003). We choose to employ Schiffman and Kanuk’s (2004) taxonomy,– included in perceived risk measuring by Kim, Qu, and Kim (2009) – which take into consideration 6 components: functional risk, physical risk, financial risk, social risk, psychological risk, and time risk. Functional risk concerns the risk that product performance will not meet consumer’s expectations. Physical risk implies the risk to self and others that the product may pose. Financial risk is the risk that the product will not be worth its cost. Social risk consists of poor product choice that may result in social embarrassment. Psychological risk is the risk that a poor product choice will bruise the consumer’s ego. Finally, time risk is the worry that the time spent in product search may be wasted if the product doesn’t perform as expected. The items for each component were adapted from Littler and Melanthiou (2006), with three or four items for each component.

H1a: Functional risk leads to halo effect on perceived risk.

Functional attributes are usually decisive in consumer’s decision making, especially in the case of durable products. The anticipation of any malfunction can cause alone a high perceived risk.

H1b: Physical risk leads to halo effect on perceived risk.

As physical safeness goes second in Maslow’s hierarchy of needs, it’s expected that the awareness of any physical risk to be enough for a consumer to consider a product very risky.

H1c: Financial risk leads to halo effect on perceived risk.

A halo effect in this case is highly expected taking into consideration the vast expertise that behavioral finance and personal finance bring. In fact, a validation of this hypothesis would be in line with many other cognitive biases that behavioral finance enlights – overconfidence, illusion of control, recency, regret and ambiguity aversion, mental accounting and others (Pompian, 2006).

H1d: Social risk leads to halo effect on perceived risk.

Every purchase has to respect the conformity of the consumer’s reference group and also, every consumer expects that the purchased brand enhances his image, so both normative and value expression influences (Evans, Jamal, and Foxall, 2010, p. 244) can put social risk in the position to cause halo effect.

H1e: Psychological risk leads to halo effect on perceived risk.

H1f: Time risk leads to halo effect on perceived risk.

The last two hypotheses are expected to confirm only for high involvement purchases, as these are supposed to take longer and have high psychological significance for consumers.

H1g: Overall risk leads to halo effect on perceived risk.
Recent research (Florea, 2014) suggests that perceived risk does not form through a weighted average between its components, as Mitchell (1999) and Fishbein (1963) stated, but rather by assigning the highest value of a component to the overall risk. From there, consumer may tend to manufacture tons of other risks to achieve higher consistency between the risk-related beliefs. The same effect can occur when the overall risk degree is borrowed through word-of-mouth and thus, foregoes its components rating.

Concerning external halo effect, several circumstances can be supposed to cause it. Traditionally, overall attitude – sometimes referred to as general impression – is the construct that induces halo effect, as we previously said. We will consider both brand overall attitude and product category overall attitude, and thus, we tackle two of the influence levels discussed earlier. Previous research (Florea, 2014) indicates that the influence works negatively and positively, as well.

H2: Perceived risk forms as a result of an external halo effect.

H2a: Brand attitude induces halo effect on perceived risk.

H2b: Category attitude induces halo effect on perceived risk.

Another plausible source is the regret a consumer feels as a result of the unfavorable background of brand - consumer or category - consumer interactions. Sometimes, consumer regret stands as explanation as well as functional risk. In fact, it’s very probable for consumer regret to induce halo effect in pair with a perceived risk component. Regret is also presumed to have the potential to induce halo effect when the affected consumer is a peer who confesses his regret through word-of-mouth. This halo source can work in the case of consumers who rely mostly on personal sources to get information for purchases.

H2c: Consumer regret induces halo effect on perceived risk.

H2d: Peers regret transmitted through word-of-mouth induces halo effect on perceived risk.

Besides these sources that are all illustrated by previous research (Florea, 2014), the scientific literature suggests some other halo sources that can be tested. Neuroscience, behavioral finance (Pompian, 2006) and even accounting (Mertins and Long, 2012) have taken into consideration the effect of information order on remembering easiness and importance. Research has shown that the first – effect called primacy – and last information – recency – is better remembered, but with respect to its importance in perceived risk updating, recency effect has more logical arguments to result significant. Both positive and negative recently found information are expected to influence perceived risk.

H2e: Recency induces halo effect on perceived risk.

Kapferer (2012) notices that brand awareness is not just a cognitive measure, but a collective phenomenon. When a brand has high awareness, consumers know that the brand is well-known, and this has a reassuring effect on consumers that make the brand more trustworthy. In fact, previous research (Schuiling and Kapferer, 2004 cited in Kapferer, 2012, p. 21) has shown high correlations between awareness and trust (0.46), and awareness and reliability (0.44), which suggest the existence of a halo effect. Note that the halo source is not awareness, but “awareness of awareness” – that is, when consumers know that a brand is well-known. Unlike the other hypothetical sources, this one can drive only favorable halo effect.

H2f: Awareness of awareness induces halo effect on perceived risk.

Figure 1 illustrates the theoretical model of perceived risk formation through halo effect. In this case, the arrows show external halo effects that the presented variables have on perceived risk, and the pluses and minuses show whether the halo is expected to happen for high and,
respectively, low values of the causing variables.

4. Method

The scientific literature provides plenty of options to study halo effect, from fairly simple dimension intercorrelations and interdimension factor structure to more complex multitrait-multimethod analysis (Coleman, Bagchi, and Shen, 2003). All the methods exhibit two major problems. Firstly, most methods provide just a glimpse of a possible halo without clear indications of its magnitude and origin. Specifically, we are looking to highlight halo sources of perceived risk, accepting the possibility of multiple sources. This means that our method must be able to catch what happens in small groups of our sample not just the blurred overall picture. Secondly, most previous studies regard halo effect as a measurement error, and thus, the challenge is to remove halo, while we consider it a mental error – halo is in consumer’s minds – so we want to emphasize this.

For more general findings, we used a sample of 451 individuals, split between gadgets, 229 consumers, FMCG, 112 individuals, and services, 110 respondents. We chose from each category a well-known brand which is susceptible to evoke risky situations or information for Romanian consumers: iPhone, Danone, and McDonald’s. As these well-known brands would probably generate very low variance on awareness of awareness, we added another brand of gadgets that is less known, Allview, so the halo of this variable is tested just for one category.

The followed procedure is to rank respondents for each variable on the basis of their contribution to the increase of correlations between the tested halo source – each variable by

**Figure 1. Perceived risk formation through halo effect – theoretical model**

<table>
<thead>
<tr>
<th>Functional risk</th>
<th>H1a (+/-)</th>
<th>Brand overall attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical risk</td>
<td>H1b (+/-)</td>
<td>Category overall attitude</td>
</tr>
<tr>
<td>Financial risk</td>
<td>H1c (-)</td>
<td>Consumer regret</td>
</tr>
<tr>
<td>Social risk</td>
<td>H1d (-)</td>
<td>Peers regret + WOM</td>
</tr>
<tr>
<td>Psychological risk</td>
<td>H1e (+/-)</td>
<td>Recency</td>
</tr>
<tr>
<td>Time risk</td>
<td>H1f (+)</td>
<td>Awareness of awareness</td>
</tr>
<tr>
<td>H1 Perceived risk</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
turn – and perceived risk components. This procedure acknowledges the most obvious sign of a halo, which is the existence of highly correlated variables. As a rule of thumb, we first select those individuals that have a positive contribution to the correlations. Depending on the results, we will further use the appropriate technique to emphasize supposed halo effects.

5. Results
The data sample proves good psychometric properties, which make it reliable to use in our analysis. Specifically, composite reliability of every variable is above the threshold of .7, insuring excellent reliability. The average shared variance exceeds the .5 threshold and composite reliability is higher than AVE, thus convergent validity is insured. Finally, the inequalities MSV<AVE and ASV<AVE are checked for all the variables, while square root of AVE is greater than the correlations with the other variables (Hair et al, 2010), so we were not facing discriminant validity issues either (Table 1). We are not dealing with any halo effect in the sense of a measurement error, as this would affect the psychometric properties of our sample.

<table>
<thead>
<tr>
<th>Variable</th>
<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>ASV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional risk</td>
<td>0.905</td>
<td>0.706</td>
<td>0.552</td>
<td>0.207</td>
</tr>
<tr>
<td>Financial risk</td>
<td>0.932</td>
<td>0.774</td>
<td>0.621</td>
<td>0.240</td>
</tr>
<tr>
<td>Social risk</td>
<td>0.848</td>
<td>0.651</td>
<td>0.514</td>
<td>0.184</td>
</tr>
<tr>
<td>Psychological risk</td>
<td>0.873</td>
<td>0.697</td>
<td>0.514</td>
<td>0.247</td>
</tr>
<tr>
<td>Physical risk</td>
<td>0.916</td>
<td>0.785</td>
<td>0.279</td>
<td>0.150</td>
</tr>
<tr>
<td>Time risk</td>
<td>0.867</td>
<td>0.686</td>
<td>0.396</td>
<td>0.181</td>
</tr>
<tr>
<td>Overall risk</td>
<td>0.962</td>
<td>0.895</td>
<td>0.621</td>
<td>0.287</td>
</tr>
<tr>
<td>Awareness of awareness*</td>
<td>0.907</td>
<td>0.765</td>
<td>0.274</td>
<td>0.034</td>
</tr>
<tr>
<td>Brand attitude</td>
<td>0.952</td>
<td>0.769</td>
<td>0.391</td>
<td>0.166</td>
</tr>
<tr>
<td>Product category attitude</td>
<td>0.957</td>
<td>0.817</td>
<td>0.238</td>
<td>0.074</td>
</tr>
<tr>
<td>Consumer regret</td>
<td>0.921</td>
<td>0.795</td>
<td>0.372</td>
<td>0.148</td>
</tr>
<tr>
<td>Others regret+WOM</td>
<td>0.900</td>
<td>0.750</td>
<td>0.203</td>
<td>0.073</td>
</tr>
<tr>
<td>Recency</td>
<td>0.903</td>
<td>0.759</td>
<td>0.372</td>
<td>0.125</td>
</tr>
</tbody>
</table>

The ranking procedure that we described above revealed a spread of halo affected individuals ranging from 19 to 56 percent of the population, as table 2 shows. Analyzing on product types, FMCG display most halos, with percents ranging from 42% for product class attitude to 56% for the internal halo sources, while services exhibit the lowest spreading, between 19 and 25 percent. This result is rather unexpected considering that FMCG usually involve lower risks – some exceptions exist especially in the case of medicines and food – than durable goods that incorporate the gadgets. Considering these results, we could say that the halo effect is an existing phenomenon for the lower percents – around 20-25 percent –, a considerable phenomenon for the variables with more than 33 percent spreading, and a major one for those that exceed half of the population.

The odd parity between perceived risk components and the clear exceeding of 100% of the aggregated spreadings made us check the halo sources distribution on individuals. The analysis shows that just 176 individuals, representing 39 percent of the sample,
are affected by halo effect in perceived risk formation. Most of them present multiple halo, being unable to discriminate between variables. Practically, the halo is so generalized in these individuals’ thinking that the method fails to reveal its real source.

Table 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Gadgets</th>
<th>FMCG</th>
<th>Services</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional risk</td>
<td>76</td>
<td>63</td>
<td>28</td>
<td>167</td>
</tr>
<tr>
<td>Financial risk</td>
<td>76</td>
<td>63</td>
<td>28</td>
<td>167</td>
</tr>
<tr>
<td>Social risk</td>
<td>76</td>
<td>63</td>
<td>28</td>
<td>167</td>
</tr>
<tr>
<td>Psychological risk</td>
<td>76</td>
<td>63</td>
<td>28</td>
<td>167</td>
</tr>
<tr>
<td>Physical risk</td>
<td>76</td>
<td>63</td>
<td>28</td>
<td>167</td>
</tr>
<tr>
<td>Temporal risk</td>
<td>76</td>
<td>63</td>
<td>28</td>
<td>167</td>
</tr>
<tr>
<td>Overall risk</td>
<td>82</td>
<td>62</td>
<td>31</td>
<td>175</td>
</tr>
<tr>
<td>Brand attitude</td>
<td>57</td>
<td>50</td>
<td>24</td>
<td>131</td>
</tr>
<tr>
<td>Product class attitude</td>
<td>55</td>
<td>48</td>
<td>22</td>
<td>125</td>
</tr>
<tr>
<td>Consumer regret</td>
<td>68</td>
<td>57</td>
<td>23</td>
<td>148</td>
</tr>
<tr>
<td>Peers regret + WOM</td>
<td>59</td>
<td>49</td>
<td>23</td>
<td>131</td>
</tr>
<tr>
<td>Recency</td>
<td>58</td>
<td>52</td>
<td>21</td>
<td>132</td>
</tr>
<tr>
<td>Awareness of awareness</td>
<td>50</td>
<td>-</td>
<td>-</td>
<td>50</td>
</tr>
</tbody>
</table>

Given the situation, we employed partial correlations to highlight suppression effect of every halo source on the correlations between perceived risk components. We compare the normal correlation matrix for the individuals affected by each halo source with the partial correlation matrix of $r_{xy|z}$, where $x$ and $y$ are perceived risk components and $z$ is the tested halo source – both internal and external halo sources. For all the halo sources, excepting overall risk, partial correlations between perceived risk components are significantly lower than the corresponding normal correlations. For overall risk, the partial correlations matrix is identical with the normal correlations matrix, which means that overall risk does not explain the relation between perceived risk components, so in other words, this variable is not a halo source. Thus, H1g is rejected, while for hypothesis H1a to H1f and H2a to H2f there is not enough evidence to reject it.

6. Conclusions

The previously proved halo effects partially belie the traditional perceived risk theory. The term “partially” is wisely used for the following reason. On one hand, the mental formation of risk perception was proved to be much simpler than the intricate calculation suggested by perceived risk theory. On the other hand, the internal halo effect can be considered a particular case of perceived risk theory, where the influence of one component is 100 percent.

Moreover, it’s important to examine the managerial and theoretical implications that this findings have. Understanding consumer behavior is unanimously acknowledged as fundamental for successful marketing planning and implementation at any level, so this new perspective is able to bring future breakthroughs in marketing science and practice.

For managerial purposes, the evidence of halo effect on perceived risk doesn’t ease managers’ job, but it actually raises new preoccupations. The fact that halo effect can stream from different sources, more or less controllable, obstructs the accurateness of failure predictions. Practically, this situation is a good argument for holistic marketing implementation, on the ground that everything matters in
marketing (Keller and Kotler, 2006, p. 20). Despite the halo effect is extremely obvious at a large number of individuals, we found hard to bound the exact source of this halo, or to establish to what extent each variable contributes. Future research has to find more appropriate methods for this case when the halo becomes a true patchwork.

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