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**Do product category and consumers' motivations profiles matter regarding  
counterfeiting?**

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***Structured Abstract:***

**Purpose:** This research explores the impact of product category and consumers' motivations profiles on the determinants of consumers' preferences and purchase intentions of counterfeits and genuine, through manipulation of product attributes and purchase situations.

**Design/Methodology:** The research relies on an experimental design involving a questionnaire on a convenience sample with two parts: a trade-off model manipulating three attributes: Product type (genuine vs counterfeit), Price (high vs low), Place of purchase (regular shop, Internet, market) in two product categories and a scale measuring motivations to purchase counterfeits. Ranking and purchase intentions are analyzed using conjoint analysis and Generalized Linear Mixed Model (GLMM).

**Findings:** Ranking reveals a dominant pattern of consumer behavior regarding counterfeiting: Product type, Price and Place of purchase. Product category has a moderating effect on choice criteria: relative importance of Place of purchase and Price varies according Product category. Consumers' motivations profiles have also a moderating effect on consumer behavior. Some profiles are more receptive to copies. Consumers' profiles exhibit different hierarchies of purchase criteria, and may change them depending upon product category.

**Originality/value:**

Results challenge literature on the dominant role of price among choice criteria. Price alone cannot determine a counterfeit purchase. It is the interaction of Price, Place of purchase or Product type that explains such a behavior. Product category matters: price and place of purchase importance cannot be considered without accounting for product category. Consumers' motivations profile matters. Consumers are not homogeneous face to counterfeits.

**Key Words:** Counterfeit, Counterfeiting, Consumers' motivations profiles, Product category, Product attributes, Purchase situation, Experimental plan, Conjoint analysis, Generalized Linear Mixed Models

**Article Classification:** Research paper

## **Do product category and consumers' motivations profiles matter regarding counterfeiting?**

**André LE ROUX, Marinette THEBAULT, Yves ROY**

### **Introduction**

According to OECD/EUIPO (2016), imports of counterfeit and pirated goods are worth nearly half a trillion dollars a year and represent around 2.5% of global imports. Up to 5% of goods imported into the European Union are fakes. According to a survey from VDMA, a German association that represents companies in the mechanical and systems engineering industry, 71% of machine and plant manufacturers in Germany are affected by product or brand piracy. The estimated damage amounts to 7.3 billion euros per year (VDMA, 2018). Counterfeiting undermines the economy through job losses. For companies, counterfeiting results in reduced turnover, lower return on investment and innovation, added costs related to legal actions and intellectual property rights (IPR) protective devices development, and leads to significant damage to brand equity. From a more global well-being standpoint, counterfeiting represents a threat for consumers as well as citizens through increased risks related to faulty or fraudulent products and triggers defiance toward products and corporations.

Academic research on counterfeiting has addressed various topics. A first stream of research focuses on the definition of counterfeiting and its consequences on original brands and on original brand owners (Bamossy and Scammon, 1985; Yoo and Lee, 2005; Commuri, 2009; Romani *et al.*, 2012; Baghi *et al.*, 2016; Le Roux *et al.*, 2016a). Another stream explores the determinants of counterfeit products purchase (Ang *et al.*, 2001; Gistri *et al.*, 2009; Wilcox *et al.*, 2009; Bian and Moutinho, 2011, Viot *et al.*, 2014). A third stream attempts to model consumer behavior regarding counterfeiting using theoretical frameworks such as the Theory of Reasoned Action or the Theory of Planned Behavior (Penz and Stöttinger, 2005; De Matos *et al.* 2007). A fourth stream addresses the managerial response to counterfeiting (Chaudhry *et al.*, 2005; Staake *et al.*, 2009; Cesareo and Stöttinger, 2015). Eisend and Schucher-Güler (2006), Zaichkowsky (2006), Lee and Yoo (2009), Staake *et al.* (2009), Cesareo (2016) provided a comprehensive cover of the topic of counterfeiting.

Despite important academic contributions, little research on the determinants of counterfeit purchase has addressed product category effect. The purpose of this study is to explore the impact of product category on the determinants of consumers' preferences and purchase intentions of counterfeits and genuine. Most research considers consumers of

counterfeits as a homogeneous population, while few studies suggest the existence of sub-populations differing in their motivations, general attitude or purchase intentions toward counterfeiting. Our research explores if accounting for consumers' motivations profiles modifies the role and the importance of the determinants of consumers' preferences and purchase intentions.

## **Literature review**

### **Defining counterfeiting**

Counterfeiting is a legal concept defined as “the act of producing or selling a product containing an intentional and calculated reproduction of a genuine trademark. A ‘counterfeit mark’ is identical to or substantially indistinguishable from a genuine mark” (McCarthy, 2004). From a marketing standpoint, "Any unauthorized manufacturing of goods whose special characteristics are protected as intellectual property rights (trademark, patent, and copyrights) constitutes product counterfeiting" (Cordell *et al.*, 1996).

Bamosy and Scammon (1985) define two types of counterfeiting: deceptive and non-deceptive counterfeiting. Deceptive counterfeiting occurs when a consumer buys a fake, believing that it is an original. Deception is due to similarity between the genuine item and the copy, therefore the consumer can be considered a victim. Non-deceptive counterfeiting means that a consumer knowingly and willingly purchases a fake product. Cues such as price, place of purchase, product quality, or the seller's explicit information leave no doubt about the illegal nature of the purchased item (Bloch *et al.*, 1993; Gentry *et al.*, 2001, 2006). In that case, the purchase is a deliberate behavior and the consumer can be considered as an accomplice to counterfeiters (Bloch *et al.*, 1993). This research focuses specifically on non-deceptive counterfeits' purchase.

### **Product categories effect**

Most surveys either do not account for a product category or focus on a single product class. According to Cesearo (2016), "out of the 572 articles analyzed, 162 articles did not make a direct reference to any specific industry, discussing counterfeit and/or pirated goods in general". When a product is studied, research focuses on consumer goods such as knit sportshirts (Bloch *et al.*, 1993), pirated music CDs (Ang *et al.*, 2001) or sunglasses (Veloutsou and Bian, 2008).

Few studies encompass different products. D'Astous and Gargouri (2001) explore bread, shampoo, polo shirts and sunglasses. They examine the impact of goodness of

imitation, brand store image and presence of the original brand on consumer evaluation of these products. Yoo and Lee (2005) investigate if counterfeits function as a promotion for genuine items on five luxury goods: handbags, designer shoes, apparel, sunglasses and jewelry. Le Roux *et al.* (2016a) explore the impact of varying degrees of imitations in terms of brand name and product appearance on consumer evaluation of four products: perfume, spirits, energy drinks and electronics. Le Roux *et al.* (2016b) study the impact of brand typicality on brand evaluation and categorization of counterfeits and imitations for the same four products tested.

Even if these studies do not address specifically the effect of product category on consumer evaluation, results show different reactions according to products. For example, D'Astous and Gargouri (2001) observe a positive impact of store image on consumer evaluations of luxury product imitations (polo and sunglasses). For convenience products (bread only), such an effect is observed only when the original brand is absent. When the original brand is present, consumer evaluations are more negative if the copy is offered in a good image store rather in a poor image store. According to Yoo and Lee (2005), consumers of counterfeits prefer counterfeits more than non-consumers of counterfeits for all products except sunglasses. Consumers of counterfeits prefer genuine items more than non-consumers of counterfeits for handbags, designer shoes, and jewelry, but not for apparel and sunglasses. Le Roux *et al.* (2016a) show that consumers react to brand name and product appearance manipulations: deviations from the original brand name and product appearance are poorly evaluated and rejected as counterfeits. However, in some product categories (spirits and perfumes), some deviations from the genuine brand name and product appearance are more acceptable.

These few results highlight that regarding consumers' reactions to counterfeiting, product category matters. The objective of our research is to study specifically the moderating effect of product category on the determinants of consumers' preferences and purchase intentions of counterfeits and genuine.

### **Determinants of counterfeits purchase**

In their review of the determinants and moderators of the volitional purchase of counterfeit products, Eisend and Schucher-Güler (2006) identify four categories of determinants: person, product, social and cultural context, and purchase situation.

Person or individual characteristics encompass demographics, such as age, income, educational level (Bloch *et al.*, 1993; Penz and Stöttinger, 2005; Cheung and Prendergast,

2006; Hamelin *et al.*, 2013) and psychographics. The psychographic variables include personality traits, such as materialism, novelty seeking, value consciousness, integrity, conformity, personal gratification, status consumption; social factors such as information susceptibility, normative susceptibility, collectivism; motivations such as desire for luxury brands, hedonistic motivation, perceived risk, and revenge on big business (Ang *et al.*, 2001; Penz and Stöttinger, 2005; Cheung and Prendergast, 2006; Veloutsou and Bian, 2008; Lee and Yoo, 2009; Phau and Teah, 2009; Geiger-Oneto *et al.*; 2013; Hamelin *et al.*, 2013; Viot *et al.*, 2014; Bian *et al.*, 2016). Personal or individual characteristics have been extensively studied, especially personality traits and motivations. Eisend (2017) provided a review of the topic through a meta-analysis.

Product-related characteristics comprise product attributes such as price, brand image, reliability, durability, physical appearance, quality, perceived fashion content, functional and hedonic or symbolic benefits (Tom *et al.*, 1998; D'Astous and Gargouri, 2001; Harvey and Walls, 2003; Yoo and Lee, 2005; Bian and Moutinho, 2009; Hamelin *et al.*, 2013; Le Roux *et al.*, 2016a). In the literature, price is considered as a dominant reason for buying counterfeit (Bloch *et al.*, 1993; Tom *et al.*, 1998; Prendergast *et al.* 2002; Harvey and Walls, 2003; Lee and Yoo, 2009). Several authors identify a positive relationship between a low price of a copy and the decision to purchase counterfeits (Harvey and Walls 2003; Gentry *et al.*, 2006; Staake and Fleisch, 2008; Lee and Yoo, 2009). In addition, a higher genuine price renders more likely the purchase of a counterfeit (Moores and Dhillon, 2000; Lee and Yoo, 2009). Schlegelmich and Stöttinger (1999) pinpoint that a 40% price differential between a genuine and a copy has a negative effect on purchase intention of originals.

Few studies account for variations or manipulations in product attributes or the degree of imitation. Bloch *et al.* (1993) explore genuine and counterfeit product choice through the test of three types of products: genuine, private label and counterfeit. Product was defined through two characteristics: brand and price level. However, since they do not independently manipulate these factors, they cannot draw any conclusion about the independent or relative effects of these variables. Consequently, they suggest manipulations through conjoint analysis as a path of future research. Harvey and Walls (2003) attempt to model purchase likelihood of a fictitious counterfeit through the manipulation of genuine price and expected penalty cost (penalty magnitude and probability of penalty) associated to the counterfeit. However, as they mostly address price and penalty elasticities differences in behavior between respondents from Las Vegas and Hong-Kong, no conclusion of the relative effect of price can be drawn. Yoo and Lee (2005) manipulate price levels of both genuine and counterfeits. They state that

"when price information is provided, preference for genuine diminishes, resulting in no significant difference from the preference of counterfeits. In addition, the hypothesis that consumers of counterfeits will show stronger intention to buy genuine items than will nonconsumers of counterfeits was not supported with price information given". Le Roux *et al.* (2016a,b) manipulate brand name, product appearance, price and place of purchase. Their results show a dominant pattern of choice among respondents based on Brand name over Price and Place of purchase. Differences observed between brands are explained by brand typicality.

Cultural and social context involves accounting for cultural and ethnic specificities, or comparisons between consumers from culturally or geographically distant contexts (Chapa *et al.*, 2006; Cheung and Prendergast, 2006; Penz and Stöttinger, 2008; Veloutsou and Bian, 2008; Kwong *et al.*, 2009; Phau and Teah, 2009).

Purchase situation relates to characteristics such as place of purchase, presence of genuine brand and expected penalty associated with purchasing counterfeits. According to Eisend and Schucher-Güler (2006), purchase situation has been largely neglected. Little research includes or manipulates different purchase settings. Bloch *et al.* (1993) explored two purchase settings: a commercial center and a flea market. They assumed that consumers surveyed at the flea market would be more likely to choose a counterfeit than would those contacted at the shopping mall. However, identical choice patterns were observed in both locations. D'Astous and Gargouri (2001) explored the effect of the store image on brand imitation evaluation, but they did not compare different purchase settings.

Results of the research on the determinants of counterfeit purchase are mixed, especially regarding demographics factors (Bloch *et al.* 1993, Lee and Yoo, 2009) as well as psychological variables (Ang *et al.*, 2001; Cheung and Prendergast, 2006; Phau and Teah, 2009). In addition, as Lee and Yoo (2009) state, "many studies have relied on nonexperimental data" (p. 32) and few research addressed the relative importance of the various determinants. Our research will confront consumers with different types of product: genuine and counterfeit, and, in order to assess the combined effect of various determinants on preferences and purchase intentions of counterfeit, it will manipulate several variables. Since our research focuses on product category, we will select the determinants that are most related to a product, i.e. product characteristics and purchase situation. Among these two kinds of antecedents, we retain price and place of purchase, because they correspond to the cues that define a non-deceptive counterfeit in the marketing literature (Bloch *et al.*, 1993; Gentry *et al.*, 2001, 2006).



### Counterfeits consumers' motivations profiles

Most research consider consumers as a homogeneous population that would either purchase or not fake products. Consumers are conceived as either buyers or non-buyers of counterfeits, whatever the product category, the product attributes or the purchase situation are. Moreover, research focuses on the attitudes and behaviors of counterfeits' consumers and ignores non-users (Davoik *et al.*, 2018).

Few studies attempt to define a plurality of consumers' profiles based on different motivations or characteristics. Tom *et al.* (1998) propose a typology of buyers and non-buyers of counterfeits based on two dimensions: consumer's perception of a high or low product parity between the genuine and the counterfeit product, and consumer's preference for the counterfeit or for the legitimate item. These dimensions yield a four-cell typology. A sly shopper perceives the genuine and the counterfeit products as equivalent and prefers the copy. An economically concerned shopper will prefer the counterfeit although he perceives a significant difference between the original and the fake. Price is the major driver despite the difference in quality. An ethical shopper will prefer the genuine product, although he/she perceives the original and the copy as equivalent. Price difference or product parity between both items on quality cannot justify the purchase of a fake. A risk adverse shopper perceives a significant difference between the original and the copy. The attractive price of the copy does not justify the risk of such a purchase. Although this research envisions different consumer segments depending on their evaluation of genuine and counterfeit products, it is limited to two dimensions.

Recently, Le Roux *et al.* (2015) propose a typology of consumers based on their motivations to buy counterfeits or not. It identifies five consumer profiles using Viot *et al.* (2014) 13 motivational dimensions: societal determinants (macroeconomic risk, economic risk for the company, risk of brand equity), individual deterrents (social, psychological, legal and physical risks, doubt about origin of product), individual motivations (fun dimension of counterfeits, revenge on large corporations, exorbitant price of originals, bargain price of counterfeits, low perceived quality difference between genuine and counterfeits).

Two profiles are attracted by counterfeits with differing motivations: Activists and Cynics. Activists exhibit positive attitudes and purchase intentions toward counterfeiting and counterfeits. Their motivations rely on a strong feeling of revenge against big corporations and a rejection of the negative economic consequences of counterfeiting for society, companies and brands. For them, counterfeits are attractive alternatives to genuine ones in terms of price and the "fun" dimension of the purchase, although they are fully conscious of

the lower quality of the copies and of the legal consequences of such a behavior. Cynics exhibit unfavorable attitudes toward counterfeiting and counterfeits, but a high possession and a purchase intention of fakes. Their motivations are twofold. Like Activists, they express a feeling of revenge on big corporations, are attracted by the bargain price of counterfeits and the ludic dimension of the purchase, and perceive few differences in quality between genuine items and copies. Still, they are sensitive to social risk and brand equity risk. Two other profiles reject counterfeiting and counterfeits in terms of attitudes and purchase intentions, again for differing motivations. They are called Rationally reluctant and Emotionally resistant consumers. The former refuse to buy counterfeits for rational motivations: price and quality. They perceive a significant difference in quality between genuine items and copies that justifies price differences between the original and the counterfeits. In addition, they exhibit a mistrust of the origin of the counterfeit and reject the "fun" or "revenge on big corporations" justifications of buying fakes. This profile is similar to Tom *et al.* (1998) ethical shopper. The latter are defiant for more emotional reasons. They reject counterfeits because of individual risks (social, psychological, legal and physical risk) as well as more collective risks (societal risk, risk for company and for brand equity). Defiance toward counterfeits is more tied to the origin of the fake than to price or quality. This profile can be related to Tom *et al.* (1998) risk adverse shopper. A fifth profile corresponds to Opportunists, who exhibit unfavorable attitudes toward counterfeiting and counterfeits, and neutral motivations in terms of product-related attributes (price and quality), revenge on big corporations or the fun of the purchase. They perceive a low risk in counterfeiting and are ready to buy fakes occasionally, as shown by their significant purchase intentions. Regarding motivations, this profile is close to Tom *et al.* (1998) sly shopper.

Our research will rely on Le Roux *et al.* (2015) typology of consumers' profiles which allows the integration of buyers and non-buyers of counterfeits and accounting for individual characteristics through consumers' motivations.

### **Research objectives and hypotheses**

The purpose of this research is to explore the impact of product category on consumers' choice criteria hierarchy and purchase intentions in reaction to manipulation of product attributes and purchase situation in an experimental design. We hypothesize a moderating effect of product category on the hierarchy of choice criteria. Price and place of purchase relative importance, as well as modality preference within these attributes, will differ for a more expensive and risky product category compared to a less expensive and risky

one. Regarding purchase intentions, we expect interactions between determinants of consumer behavior toward copies and genuine items: product category, price and place of purchase.

In addition, since regarding counterfeiting consumers cannot be considered as a homogenous population, we will investigate if product category, product type, price, place of purchase effects on preferences and purchase behavior differ among consumers' motivations profiles. We hypothesize a moderating effect of consumers' motivations profiles on product type, price and place of purchase. Product type, price and place of purchase relative importance as well as modality preference will differ among consumers' profiles. We expect some consumers' profile to be more sensitive to product type, while others will be more sensitive to price. Regarding purchase intentions, we expect interactions between product category, product type, price and place of purchase.

## **Methodology**

The research involves an experimental survey that comprises a trade-off model. In addition, the questionnaire includes a psychometric scale measuring consumers' motivations to purchase or not counterfeits, a manipulation check on perceived risk of the selected product categories, and socio-demographics.

The research encompasses two product categories: a low risk and less expensive product, an Eastpak backpack, a higher risk and more expensive product with a technological dimension, a Canon digital camera. In the questionnaire, perceived risk associated with each product category is measured on a single Likert item ("For me the purchase of a digital camera / a backpack is a risky one") using a five-point scale (1 = Not at all risky, 5 = Very risky). A manipulation check through a  $t$  test confirms a significant difference in perceived risk for the two selected product categories ( $t = 13.039$ ,  $df=169$ ,  $p\text{-value} < 0.001$ ).

The main part of the study is an experiment where respondents are presented a set of ten stimuli built with an orthogonal design of main effects: Product type (explicit mention: genuine products *vs* counterfeits), Price (high: public price observed on market *vs* low: 33% of public price), Place of purchase (regular shop, Internet, market). The orthogonal design ensures a zero correlation between the main effects.

The stimuli used (see Appendix) involve a pictorial representation of the product specifying the place of purchase, the price and the product type, along with a scenario presenting the purchase situation: "While on a trip abroad, *in a shop / on Internet / at a market*, you are proposed a *Canon digital camera / an Eastpak backpack* for a price of *low / high*. It's a *genuine product / a counterfeit*" (*italics* for variations). The scenario is used to

improve the ecological validity of the survey. It is unlikely to encounter counterfeits in a regular shop in western countries, as no distributor would accept risking its brand image through counterfeit selling. The mention of a foreign setting attempts to account for this aspect.

The data is collected on a convenience sample of 170 respondents (male = 31%, female = 69%, age in years: mean = 22.76, SD = 1.81). Fieldwork was conducted among students in a French university from October 2013 to February 2014. Each respondent has to rank without ties all ten stimuli in each product category from the most preferred to the least one. In addition, for each stimulus, a purchase intention is collected on a four-point scale (Would you buy this product?: 1 = certainly not, 4 = certainly).

The impact of product category, product characteristics and purchase situation on consumer behavior is explored through a conjoint analysis methodology using the TRANSREG<sup>1</sup> procedure in a non-metric way: rankings are allowed to be transformed in an optimal manner preserving only monotonicity. The purpose of the conjoint analysis is to describe and model consumers' preferences (Green and Srinivasan, 1990). It allows the identification of the attributes a consumer uses to evaluate an object, the relative importance of each one, and the preferred modalities.

To cross-validate the attributes preferences expressed in rankings, we then analyze the ordinal purchase intentions of each stimulus by fitting a Generalized Linear Mixed Model (GLMM, see Agresti, 2013 for details). The GLIMMIX<sup>1</sup> procedure is used: the independent variables for comparisons (i.e. Product category and Consumers' motivations profiles) are considered as nominal variables. The dependent variables (i.e. 4 levels of buying intention) are considered following conditional binomial distributions constrained by the order condition. A cumulative logit transformation was used. The respondents are random intercepts. This type of analysis has a better support from probability theory and allows statistical tests of complex hypotheses. The research model is as follows: the buying intentions are a non-linear function of the buying context (i.e. Product category, Product type, Price, and Place of purchase). The baseline models are built with three main effects: Product type, Price, and Place of purchase, adding the product category as a moderator. The treatment of individuals as random factors allows eliminating spurious correlations induced by the fact that each respondent has expressed his intention for each stimulus and that, consequently, these scores cannot be considered independent and identically distributed. The estimation

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<sup>1</sup> SAS Institute Inc. (2017). SAS/STAT® 14.3 User's Guide. Cary, NC:SAS Institute Inc.

technique used here is the Gauss quadrature. A systematic check with a Laplace approximation eliminated the risk of a local optimum of the likelihood function.

The use of two measures, ranking of products and buying intentions, is made for the sake of robustness of the results. Both measures have their drawbacks: the forced distribution of the rankings, without ties, can sometimes introduce artificial differences between buying contexts. At the opposite, the ties induced in the buying intention could mask different degrees of rejection of a product or a context. Crossing the two measurement processes and obtaining consistent results is a way to overcome these limitations.

Finally, Consumers' motivations profiles are introduced using cluster membership from Le Roux *et al.* (2015) based on Viot *et al.* (2014) psychometric scale measuring consumers' motivations to purchase or not counterfeits. In the conjoint analysis, a trade-off is run for each consumers' motivations profile. In GLMM analysis, the cluster membership from Le Roux *et al.* (2015) is added as a categorical moderator variable to highlight differences in the decision-making determinants. The research model becomes as follows: the buying intentions are a non-linear function of the buying context (i.e. Product category, Product type, Price, and Place of purchase) and Consumers' motivations profiles regarding counterfeiting. The generating processes of the experimental design, on one hand, and the grouping of respondents based on their motivations, on the other hand, are totally independent. Thus, no form of collinearity or feedback is to be feared.

## **Results**

First, we investigate how consumers react to the manipulation of product attributes and purchase setting in the selected product categories by comparing both rankings and purchase intentions. Then, consumers' profiles are introduced in the analysis in order to assess their influence on stimuli choice and purchase behavior.

### **Investigating Product category effect on stimuli ranking through conjoint analysis**

The conjoint analysis allows the estimation of the relative importance of each of the manipulated factors for the selected product categories. For both product categories, a logical hierarchy in variable importance is observed: Product type is the dominant choice criterion (relative importance: digital camera = 43.16%, backpack = 42.98%), ahead of Price (respectively 31.95% and 37.23%) and Place of purchase (respectively 24.89% and 19.79%). However, a product category effect is suggested by a slight difference between the product

classes tested: while the hierarchy of importance is clear for the backpack, Price and Place of purchase are closer in importance for the digital camera.

For both product categories, respondents exhibit rational preferences: they prefer a genuine to a fake, a low price to a high one, a regular shop to Internet and to the market. Again, a product category effect is suggested through a slight difference regarding the Place of purchase: For the backpack, Internet (Utility = -0.40) and the market (Utility = -0.65) are equally rejected. However, for the digital camera, while the shop is overwhelmingly preferred (Utility = 1.03), Internet becomes a slightly acceptable modality (Utility = 0.07), and the market is strongly rejected (Utility = -1.10).

In conclusion, conjoint analysis suggests a product category effect on the ranking of stimuli. However, this type of analysis does not provide any indicator of the significance of the product category effect. Therefore, a Generalized Linear Mixed Model is used in order to estimate the moderating effect of the product category on purchase intentions.

#### **Investigating Product category effect on purchase intentions through a Generalized Linear Mixed Model**

The final model has an AICC (6250.21) drastically smaller than the intercept-only model (8339.79) for only eleven (11) additional parameters, showing a very good fit. The random intercept by respondent  $\times$  category is significant (var = 1.137, std err = 0.189), which validates the choice of a mixed model. The type III tests are given in table 1.

#### **Insert Table 1 here**

All main effects are significant and the estimators for the attributes are those expected: for the backpack, which is the reference category. A genuine product exhibits higher purchase intentions than a counterfeit ( $t = 13.04$ ), a low price than a high price ( $t = 18.94$ ). Regarding Place, a purchase in a store is strictly preferred to a purchase on the Internet ( $t = 3.24$ ), which in turn is strictly preferred over a market ( $t = 3.75$ ). These results parallel those of the conjoint analysis and confirm that respondents used all three manipulated attributes to rank products and to state their purchase intentions. No three-way interaction was found significant. The effect of the product category will be investigated through the analysis of the significant two-way interactions.

A moderating effect of the product category can be observed for Price and Place of purchase. A significant Product category  $\times$  Price interaction indicates that, compared to the

reference category (backpack), a low-priced camera is less likely to be bought ( $t = 2.94$ ), which corresponds to the smaller importance of Price seen in the conjoint analysis. A significant Product category x Place of purchase interaction shows that the intention to buy a camera on the Internet is, relative to the backpack, closer to the physical shop ( $t = 1.68$ ,  $p$ -value  $> 0.05$ ) and farther from the market ( $t = 4.07$ ).

In addition, a significant Product type and Place interaction means that a counterfeit is more likely to be bought at a market ( $t = 3.85$ ) than predicted by the main effects only. A significant Product type and Price interaction shows that, for a counterfeit, a low price is not sufficient to trigger the purchase ( $t = 2.40$ ). A significant Place of purchase and Price interaction indicates that a low price is specially appreciated in a regular shop ( $t = 2.83$ ).

### **Investigating Consumers' motivations profiles effect on stimuli ranking through conjoint analysis**

The conjoint analysis was re-run on each of the five consumer clusters, for each product category tested (see Table 2). This analysis allows accounting for the impact of consumers' motivations profiles on rankings of stimuli. Results suggest a consumer profiles effect. In the backpack product category, three different hierarchies are observed. On one side, consumer profiles opposed to counterfeiting (i.e. Rationally reluctant and Emotionally resistant consumers) express a choice overwhelmingly based on Product type. On the other side, Activists exhibit a choice based mainly on Price. Cynics and Opportunists are in-between with a choice based on Product type and Price, with similar importance for each variable.

### **Insert Table 2 here**

However, in the digital camera product category, results are homogeneous across consumer profiles. All clusters exhibit the same clear hierarchy regarding attributes importance: Product type is the dominant choice criterion, ahead of Price and Place of purchase. Therefore, a product category effect can be observed, along with the impact of consumers' motivations profiles.

### **Investigating Consumers' motivations profiles effect on purchase intentions through a Generalized Linear Mixed Model**

The consumers' profiles have been introduced into the model. Overall, the direct and indirect effects observed in the previous GLMM remain significant. Introducing the cluster

membership as a moderator enhances the fit. The AICC of the baseline model (6250.21) becomes 6187.41 for a model including the cluster and two interactions: Cluster  $\times$  Product type and Cluster  $\times$  Price. For 9 additional parameters to estimate, this is significant at the 0.1% level. The moderating effect of cluster membership is significant for Product type ( $F = 3.12$ , num  $df = 4$ , p-value = 0.0144) and for Price ( $F = 9.76$ , num  $df = 4$ , p-value  $< 0.001$ ). The estimates are shown in table 3.

### **Insert Table 3 here**

A series of contrasts summarizes our main findings. Regarding Product type, the total marginal effect of cluster membership clearly opposes Activists and Cynics *vs.* Rationally reluctant and Emotionally resistant consumers ( $t = 3.03$ ), the former being less opposed to buying fakes, and Opportunists being in between. All profiles prefer to buy a genuine product, but the Activists are more prone than all other clusters to buy a counterfeit ( $t = 2.10$ ), once again followed by Cynics and Opportunists ( $t = 3.29$ ).

Regarding Price, at a high price, there is no real difference between profiles as the most frequent answer is “certainly not”, but for a low price, Cynics, Activists and, to a lesser extent, Opportunists will buy more often, regardless of the other attributes of the trade-off ( $t = 5.34$ ).

### **Discussion**

This research explores the impact of product category and consumers' motivations profiles on consumers' choice criteria and behaviors regarding counterfeiting through the manipulation of product attributes and purchase setting (i.e. Product type, Price and Place of purchase).

#### **Importance of manipulating product characteristics and purchase situation**

This research highlights a dominant pattern in consumer behavior regarding counterfeiting: Product type, Price and Place of purchase. Literature identifies the same decision criteria (Bloch *et al.*, 1993; Gentry *et al.*, 2001, 2006), but it emphasizes the dominant role of price in consumer decision making. Our results highlight the importance of product type, before price. Therefore, price cannot be considered as the dominant choice criterion contrary to what literature suggests. In addition, regarding price effects, literature suggests that the low price of counterfeits attracts consumers (Harvey and Walls 2003; Gentry *et al.*, 2006; Staake and Fleisch, 2008; Lee and Yoo, 2009). However, according to our



results, if a low price attracts consumers especially in the case of a regular shop, a low price is not sufficient to trigger a counterfeit purchase. Therefore, price alone cannot determine a counterfeit purchase. It is the interaction of Price, Place of purchase or Product type that explains such a behavior.

Furthermore, contrary to Bloch *et al.* (1993) results, our research shows that Place of purchase is a significant choice criteria for consumers regarding counterfeits. A consumer is more likely to buy a counterfeit at a market than in a regular shop or on the Internet.

In conclusion, through product characteristics and purchase setting manipulations, our research shows that various criteria, in addition to price, matter for consumers, in purchasing or not counterfeit or genuine.

### **Product category matters**

Relative importance of Place of purchase and Price varies according to Product category. Place of purchase preferences are different according to Product category: Internet is an acceptable Place of purchase for a digital camera, while it is not true for a backpack. In addition, depending upon Product category, purchase intentions in different Places of purchase vary. Therefore, as Product category influences Place of purchase perception and role, it needs to be accounted for. As noticed by Eisend and Schucher-Güler (2006), purchase situation has been largely neglected in literature. Our results show that it is an important dimension of consumer behavior. Bloch *et al.* (1993) and D'Astous and Gargouri (2001) highlight differences in consumers' reactions to purchase setting. However, they did not provide any evidence of the type of effect or influence of such a variable on consumer behavior.

Product category influences Price importance: for some products, such as a camera, a low price is less attractive than for a more mundane product category (i.e. backpack). Therefore, Price importance in a purchase cannot be considered without accounting for Product category. Again, our results challenge the assumption in literature that the price advantage of a counterfeit attracts consumer purchase. This price advantage may be more or less attractive for consumers, depending upon product category.

However, Product category does not interact with Product Type. It suggests that no product category is safe from counterfeiting. There is no product category in which a consumer will never consider, or will always consider, buying a counterfeit. The decision of buying a fake is a combination of Product category, Price or Place of purchase.

### **Consumers' Motivations Profiles matter**

Consumers' profiles have been scarcely studied in literature. So far, only typologies of consumer profiles have been proposed (Tom *et al.* 1998; Le Roux *et al.*, 2015) but have not been related to consumers' preferences and purchase intentions. Our research shows a moderating effect of Consumers' profiles on buying behavior. Some profiles are more receptive to counterfeits: Activists and Cynics are less opposed to counterfeits than Rationally reluctant and Emotionally resistant consumers. Moreover, some profiles are more attracted by a low price: Opportunists, Activists and Cynics express a higher preference for a low price. Face with counterfeiting and price, all consumers do not react in the same way. Therefore, consumers' motivations profiles need to be accounted for when considering consumer behavior regarding counterfeiting. In the literature, the influence of psychological variables, such as motivations, on consumer behavior has been studied in isolation (i.e.: influence of perceived risk on attitude and purchase intention of counterfeits), resulting in mixed conclusions. Our research accounts for the influence of a combination of motivations through consumers' profiles. Such a perspective allows research to account for the influence of motivations through consumers' profiles. For example, perceived risk is a major determinant for Emotionally resistant consumers, while it is not relevant for Activists or Opportunists.

In addition, Consumers' profiles exhibit different choice criteria hierarchies depending upon the product category considered. For the backpack, Activists main choice criterion is Price, Opportunists and Cynics equally weight Price and Product type, Rationally reluctant and Emotionally resistant consumers' choice is based on Product type. However, when considering the digital camera, all profiles have the same main choice criterion: i.e. Product type. A same consumers' profile may change its choice criteria depending upon the product category considered. For an Activist, a counterfeit may be acceptable in a low perceived risk (i.e. functional, financial, physical, social, psychological risk, Jacoby and Kaplan, 1972) product category, while it will not be accepted in a high perceived risk product category. Therefore, it seems that both moderating variables identified in this research interact: Product category and Consumers' motivations profiles.

From an academic standpoint, this research confirms the role of product attributes, such as Price, and purchase setting such as Place of purchase, as important determinants of consumers' purchase behavior of counterfeits. In addition, our results bring new insights regarding the hierarchy of choice criteria, with Product type as the major choice criterion ahead of Price and Place of purchase. This result contradicts existing literature that pinpoints price as the major determinant of a counterfeit purchase. Moreover, product category matters

in understanding consumers' reactions to counterfeits and genuine. This research highlights the difference in relative importance of choice criteria (i.e. Place of purchase and Price) between the two product categories tested. In addition, Product category interacts with Price and Place of purchase. Again, these findings challenge the existing literature that emphasizes the importance of price. Price effects are to be considered in relation to other variables, i.e. Product category, Place of purchase or Product type.

Finally, our research brings new insights in introducing the role of Consumers' profiles in relation to Price, Place of purchase, Product type and Product category. Consumers are not a homogeneous population face to counterfeiting. Some profiles are more receptive than others to counterfeiting and exhibit different hierarchies of purchase criteria. In addition, some profiles may change their hierarchies depending on Product category. Contrasting consumers' profiles allows better understanding of the role of the different determinants studied and their inter-relatedness.

From a managerial standpoint, this research emphasizes the need to adopt a global and a targeted approach when it comes to counterfeiting.

A global approach is vital due to the interactions between Product category, Price and Purchase situation. Situation-related variables are crucial in fighting counterfeiting, as the place of purchase is a major cue to categorize items, i.e. genuine or fake. It is therefore of the utmost importance to warrant retailers cooperation in fighting counterfeiting. In addition, price setting of genuine must be done in considering place of purchase and product category.

Consumers diversity regarding motivations and behaviors faced with counterfeits pleads for a diversified and targeted approach to counterfeit warnings. Targeted communication campaigns, designed to make the different profiles perceive the drawbacks and dangers of counterfeiting, may help to deter them from buying fakes. In addition, the interactions observed between Consumers' profiles and Price or Product type show that three profiles are more easily attracted by low price or counterfeits. These segments constitute a major threat for genuine manufacturers and priority targets for communication and legal actions.

### **Limitations and future research**

This research presents several limitations. It has been conducted on a convenience sample, considering only two product categories, and manipulating only one product attribute, price on two modalities, and one purchase setting, place of purchase, on three modalities.

Results cannot therefore be generalized to other populations, product categories, product attributes or settings. Further research could include a more representative sample of the population of consumers, additional product categories and attributes. Moreover, Product type comprised only two modalities, genuine or counterfeits without considering varying degrees of similarity.

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**Table 1: Results of Type III tests for the baseline GLMM**

<i>Type III Tests of Fixed Effects</i>					
<i>Effect</i>	<i>Num</i>	<i>DF</i>	<i>Den</i>	<i>DF</i>	<i>F Value Pr &gt; F</i>
Product type	1	3047	852.21	<.0001	
Price	1	3047	796.77	<.0001	
Place	2	3047	83.38	<.0001	
Product type*Price	1	3047	5.77	0.0164	
Product type*Place	1	3047	39.19	<.0001	
Price*Place	1	3047	8.04	0.0046	
Product Category	1	338	6.41	0.0118	
Product Category *Price	1	3047	8.66	0.0033	
Product Category *Place	2	3047	8.92	0.0001	

**Table 2: Results of Conjoint analysis by consumer profile**

Product category	Label	Cluster														
		cynics		opportunists		activists		rationally reluctants		emotionally resistant						
		U	StdErrImp (%)	U	StdErrImp (%)	U	StdErrImp (%)	U	StdErrImp (%)	U	StdErrImp (%)					
camera	Intercept	5.458	0.079	. 5.481	0.101	. 5.638	0.166	. 5.590	0.082	. 5.479	0.117	.				
	genuine	1.811	0.077	42.0	1.697	0.098	40.2	1.960	0.160	46.3	1.937	0.079	45.7	2.210	0.113	49.9
	counterfeit	-1.811	0.077	.-1.697	0.098	.-1.960	0.160	.-1.937	0.079	.-2.210	0.113	.				
	low	1.461	0.077	33.9	1.419	0.098	33.6	1.246	0.160	29.5	1.296	0.079	30.6	1.168	0.113	26.4
	high	-1.461	0.077	.-1.419	0.098	.-1.246	0.160	.-1.296	0.079	.-1.168	0.113	.				
	shop	1.143	0.105	24.1	1.152	0.133	26.2	0.672	0.219	24.2	0.782	0.109	23.7	1.101	0.155	23.7
	internet	-0.208	0.125	.-0.094	0.159	. 0.688	0.262	. 0.448	0.130	.-0.106	0.185	.				
	market	-0.934	0.105	.-1.058	0.133	.-1.360	0.219	.-1.229	0.109	.-0.995	0.155	.				
backpack	Intercept	5.400	0.071	. 5.403	0.099	. 5.414	0.131	. 5.436	0.079	. 5.464	0.122	.				
	genuine	1.792	0.068	39.7	1.752	0.095	42.8	1.470	0.127	33.5	2.019	0.076	47.9	2.030	0.118	45.0
	counterfeit	-1.792	0.068	.-1.752	0.095	.-1.470	0.127	.-2.019	0.076	.-2.030	0.118	.				
	low	1.738	0.068	38.5	1.656	0.095	40.5	2.320	0.127	53.0	1.509	0.076	35.8	1.162	0.118	25.8
	high	-1.738	0.068	.-1.656	0.095	.-2.320	0.127	.-1.509	0.076	.-1.162	0.118	.				
	shop	1.229	0.094	21.7	0.878	0.130	16.7	0.754	0.173	13.5	0.846	0.104	16.3	1.407	0.161	29.2
	internet	-0.501	0.112	.-0.487	0.156	.-0.429	0.207	.-0.322	0.124	.-0.182	0.192	.				
	market	-0.729	0.094	.-0.391	0.130	.-0.326	0.173	.-0.524	0.104	.-1.224	0.161	.				

**Table 3: Results of Generalized Linear Mixed Model including consumers profiles**

Effect	Purchase intention	Product category	Solutions for Fixed Effects				Standard			Pr >  t
			Price	Product type	Place	Cluster	Estimate	Error	DFt	
Intercept	certainly not						0.2497	0.3097	334	0.810.4207
Intercept	probably not						2.3131	0.3135	334	7.38<.0001
Intercept	probably						4.3779	0.3256	334	13.44<.0001
Cluster						cynics	-0.3080	0.3201	334	-0.960.3366
Cluster						opportunists	0.3059	0.3418	334	0.900.3714
Cluster						activists	0.4335	0.4433	334	0.980.3289
Cluster						rationally reluctants	-0.09399	0.3245	334	-0.290.7722
Cluster						emotionally resistants	0	.	.	.
Product category		digital camera					0.6153	0.2083	334	2.950.0034
Product category		backpack					0	.	.	.
Price			Low				-2.3974	0.2897	3039	-8.28<.0001
Price			High				0	.	.	.
Product type				counterfeit			2.4849	0.3159	3039	7.87<.0001
Product type				genuine			0	.	.	.
Place					shop		-1.2660	0.1655	3039	-7.65<.0001
Place					internet		-0.6940	0.1818	3039	-3.820.0001
Place					market		0	.	.	.
Product category *Price		digital camera	Low				0.4715	0.1538	3039	3.070.0022
Product category *Price		digital camera	High				0	.	.	.
Product category *Price		backpack	Low				0	.	.	.
Product category *Price		backpack	High				0	.	.	.
Product category *Place		digital camera			shop		-0.4886	0.1717	3039	-2.850.0045
Product category *Place		digital camera			internet		-0.8093	0.2011	3039	-4.03<.0001
Product category *Place		digital camera			market		0	.	.	.
Product category *Place		backpack			shop		0	.	.	.
Product category *Place		backpack			internet		0	.	.	.
Product category *Place		backpack			market		0	.	.	.
Product type*Place				counterfeit	shop		1.1518	0.1824	3039	6.31<.0001
Product type*Place				counterfeit	internet		0.8741	0.2272	3039	3.850.0001
Product type*Place				counterfeit	market		0	.	.	.
Product type*Place				genuine	shop		0	.	.	.
Product type*Place				genuine	internet		0	.	.	.
Product type*Place				genuine	market		0	.	.	.
Price* Product type			Low	counterfeit			0.4953	0.1945	3039	2.550.0109
Price* Product type			Low	genuine			0	.	.	.
Price* Product type			High	counterfeit			0	.	.	.
Price* Product type			High	genuine			0	.	.	.
Price*Place			Low		shop		-0.5364	0.1807	3039	-2.970.0030
Price*Place			Low		internet		0	.	.	.
Price*Place			Low		market		0	.	.	.
Price*Place			High		shop		0	.	.	.
Price*Place			High		internet		0	.	.	.
Price*Place			High		market		0	.	.	.
Product type*Cluster				counterfeit		cynics	-0.1863	0.3022	3039	-0.620.5376
Product type*Cluster				counterfeit		opportunists	0.07009	0.3279	3039	0.210.8308
Product type*Cluster				counterfeit		activists	-1.1022	0.3993	3039	-2.760.0058
Product type*Cluster				counterfeit		rationally reluctants	-0.01771	0.3077	3039	-0.060.9541
Product type*Cluster				counterfeit		emotionally resistants	0	.	.	.
Product type*Cluster				genuine		cynics	0	.	.	.
Product type*Cluster				genuine		opportunists	0	.	.	.
Product Type*Cluster				genuine		activists	0	.	.	.
Product type*Cluster				genuine		rationally reluctants	0	.	.	.
Product type*Cluster				genuine		emotionally resistants	0	.	.	.
Price*Cluster			Low			cynics	-1.1076	0.2935	3039	-3.770.0002
Price*Cluster			Low			opportunists	-1.6209	0.3214	3039	-5.04<.0001
Price*Cluster			Low			activists	-1.0673	0.3966	3039	-2.690.0072
Price*Cluster			Low			rationally reluctants	-0.3765	0.2966	3039	-1.270.2045
Price*Cluster			Low			emotionally resistants	0	.	.	.
Price*Cluster			High			cynics	0	.	.	.
Price*Cluster			High			opportunists	0	.	.	.
Price*Cluster			High			activists	0	.	.	.
Price*Cluster			High			rationally reluctants	0	.	.	.
Price*Cluster			High			emotionally resistants	0	.	.	.

### Appendix: Stimuli used in the survey

#### PRODUCT X

"While on a trip abroad, in *a shop / on Internet / to a market*, you are proposed a Canon digital camera for a price of *156 € / 469 €*. It's *a genuine product / a counterfeit*"



#### PRODUCT X

"While on a trip abroad, in *a shop / on Internet / to a market*, you are proposed an Eastpak backpack for a price of *16.66 € / 49.99 €*. It's *a genuine product / a counterfeit*"

