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**EXPLORING CONSUMER BEHAVIOR REGARDING COUNTERFEITING:
HOW PRODUCT CATEGORY, PRODUCT ATTRIBUTES, PURCHASE SITUATION
AND CONSUMERS' MOTIVATIONS PROFILES IMPACT BEHAVIOR
REGARDING COUNTERFEITS AND GENUINE**

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Abstract:

This research explores consumer choice criteria and behaviors in a non-deceptive counterfeit context, in reaction to manipulation of product attributes and purchase situation in different product categories, and relates these behaviors to different consumers' motivations profiles.

The research involves a questionnaire survey on a convenience sample of 170 respondents with two parts: a scale measuring motivations to purchase counterfeits, a trade-off model manipulating three attributes: Product type (genuine products vs counterfeits), Price (high vs low), Place of purchase (regular shop, internet, market) in two product categories (digital camera and backpack). Data are analyzed using conjoint analysis and Generalized Linear Mixed Model (GLMM).

Conjoint analysis reveal a general pattern of consumers' preferences regarding product type, price and place of purchase in the selected product categories. GLMM allows modeling of interactions between predictors. The introduction of motivations profiles highlights differences between consumers' profiles in terms of hierarchy of preference and purchase intentions.

This research brings new insights about consumer behavior regarding counterfeiting. It pinpoints the importance of considering the purchase setting, product attributes, and product category as important variables in understanding consumers' reactions to counterfeits. It highlights the interactions and explores the relations that exist between consumer motivations profiles, and product-related and situation-related variables. From a managerial standpoint, this research emphasizes both the importance of the purchase situation and the diversity of consumers when it comes to counterfeiting.

Key Words: Counterfeit, Counterfeiting, Consumer Profiles, Product category, Product Attributes, Purchase situation, Experimental plan, Conjoint analysis, Generalized Linear Mixed Models

EXPLORING CONSUMER BEHAVIOR REGARDING COUNTERFEITING: HOW PRODUCT CATEGORY, PRODUCT ATTRIBUTES, PURCHASE SITUATION AND CONSUMERS' MOTIVATIONS PROFILES IMPACT BEHAVIOR REGARDING COUNTERFEITS AND GENUINE

1. 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. From a demand perspective, a recent survey from the Tunisian National Institute for Consumption indicated that 77% of Tunisian consumers prefer to buy counterfeit due to their low price and to a low consumer purchasing power (INC, 2018). From a supply side perspective, 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 (Bamossy and Scammon, 1985; Grossman and Shapiro, 1988; Bloch *et al.*, 1993, Le Roux *et al.*, 2016a) and its consequences on original brands (Nia and Zaichkowsky, 2000; Yoo and Lee, 2005; Juggessur and Cohen, 2009; Hieke, 2010; Romani *et al.*, 2012; Baghi *et al.*, 2016), and on original brand owners (Commuri, 2009). 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 (Chang, 1998, Penz and Stöttinger, 2005, De Matos *et al.* 2007). A fourth stream addresses the managerial response to counterfeiting (Bush *et al.*, 1989; Chaudhry *et al.*, 2005; Staake *et al.*, 2011; Cesareo and Stöttinger, 2015). Eisend and Schucher-Güler (2006), Zaichkowsky (2006), Staake *et al.* (2009) provided a comprehensive cover of the topic of counterfeiting.

However, despite these important academic contributions, few research attempted to test different types of counterfeit products and product attributes in order to explore consumer choice criteria and behaviors. Besides, most surveys consider consumers of counterfeits as a homogeneous population. Few studies attempted to explore the possibility of a variety of consumer profiles regarding counterfeits, and how these profiles would react to counterfeiting. The purpose of this research is to explore consumer choice criteria and behaviors in a non-deceptive counterfeit context, in reaction to manipulation of product attributes and purchase situation in different product categories, and to relate these behaviors to different consumers' motivations profiles.

2. Literature review

A. 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).

Marketing literature defines two types of counterfeiting: deceptive and non-deceptive counterfeiting (Bamossy and Scammon, 1985, Grossman and Shapiro, 1988; Bloch *et al.*, 1993; Bian and Veloutsou, 2007). Deceptive counterfeiting occurs when a consumer buys a fake, believing that it is an original. Deception is due to similarity between the genuine and the copy, therefore the consumer can be considered as 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 seller explicit information leave no doubt about the illegal nature of the purchased item (Bloch *et al.*, 1993; Chakraborty *et al.*, 1997; Gentry *et al.*, 2001, 2006). In that case, the purchase is a deliberate behavior and the consumer can be considered as an accomplice of counterfeiters (Bloch *et al.*, 1993). This research focuses specifically on non-deceptive counterfeit purchase.

B. Determinants of counterfeit purchase

In their review of the determinants and moderators of the volitional purchase of counterfeit products, Eisend and Schuchert-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; Wee *et al.*, 1995; Penz and Stöttinger, 2005; Cheung and Prendergast, 2006; Hamelin *et al.*, 2012) and psychographics. The psychographic variables include personality traits, such as materialism, novelty seeking, value consciousness, integrity, conformity, personal gratification, status consumption (Wee *et al.*, 1995; Ang *et al.*, 2001; Penz and Stöttinger, 2005; Cheung and Prendergast, 2006; Phau and Teah, 2009; Yoo and Lee, 2009, Geiger-Oneto *et al.*, 2012), social factors such as information susceptibility, normative susceptibility, collectivism (Ang *et al.*, 2001; Penz and Stöttinger, 2005; Phau and Teah, 2009), motivations such as desire for luxury brands, hedonistic motivation, perceived risk, revenge on big business, (Wee *et al.*, 1995; Penz and Stöttinger, 2005; Veloutsou and Bian, 2008; Hamelin *et al.*, 2012; Viot *et al.*, 2014, Bian *et al.*, 2016). Person or individual characteristics have been extensively studied, especially personality traits and motivations. Eisend provided a review of the topic through a meta-analysis (2017).

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 (Wee *et al.*, 1995; Tom *et al.*, 1998; D'Astous and Gargouri, 2001; Harvey and Walls, 2003; Yoo and Lee, 2005; Bian and Moutinho, 2008; Hamelin *et al.*, 2012; Le Roux *et al.*, 2016a). Few studies account for variations or manipulations in product attributes or the degree of imitation. Bloch *et al.* (1993) explored genuine and counterfeit product choice through the test of three types of product: a genuine, a private label and a counterfeit. Product type was defined through two characteristics: brand and price level. Harvey and Walls (2003) attempted to model purchase likelihood of a fictitious counterfeit through the manipulation of price and expected penalty cost (penalty magnitude and probability of penalty). Yoo and Lee (2005) manipulated price levels of both genuine and counterfeits. Le Roux *et al.* (2016a,b) manipulated brand name, product appearance, price and place of purchase.

Cultural and social context involves accounting for cultural and ethnic specificities, or comparisons between consumers from culturally or geographically distant contexts (Lai and Zaichkowsky, 1999; 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, expected penalty associated with purchasing counterfeits. According to Eisend and

Schuchert-Güler (2006), purchase situation has been largely neglected. Few research include or manipulate different purchase settings. Bloch *et al.* (1993) explored two purchase settings: commercial center and flea market. D'Astous and Gargouri (2001) explored the effect of the place of purchase image on brand imitation evaluation. In an experimental design, goodness of imitation, presence/absence of the imitated brand, and store reputation were manipulated.

Besides, most studies focus on a single product class such as knit sportshirts (Bloch *et al.*, 1993), auto parts (Chakraborty *et al.* 1997), software (Chang, 1998), pirated music CDs (Ang *et al.*, 2001), sunglasses (Veloutsou and Bian, 2008). Few studies include different product categories, preventing from comparing consumer reactions. D'Astous and Gargouri (2001) explored bread and shampoo (convenience products) versus polo shirts and sunglasses (luxury products). Yoo and Lee (2005) investigated if counterfeits function as a promotion for genuine items in five product categories: handbags, designer shoes, apparel, sunglasses and jewelry. Le Roux *et al.* (2016a,b) explored consumer evaluation to varying degrees of imitations in various product categories: perfume, spirits, energetic drinks, and electronics.

C. Exploring counterfeits consumers' profiles

Research focus on the attitudes and behaviors of counterfeits' consumers and ignore non-users (Davicik *et al.*, 2018). Some research attempted to compare buyers and non-buyers of counterfeits on individual factors such as demographics, social influence and personality factors. Bloch *et al.* (1993) attempted to contrast genuine and counterfeit buyers on demographics and self-image. Respondents exhibited no difference in terms of demographics. Regarding self-image, counterfeit buyers exhibit a lower self-esteem and self-confidence, and perceive themselves as less well-off and less successful than genuine and private label buyers. Ang *et al.* (2001) attempted to differentiate buyers and non-buyers of pirated CD on demographics, social influence and personality traits. They found no difference on demographics. Buyers and non-buyers differed on normative susceptibility, value consciousness, integrity and income. Phau and Teah (2009) explored how social and personality factors influence attitude towards counterfeits of luxury brands in a Chinese context. They found that buyers of luxury counterfeits differed in terms of information and normative susceptibility, personal gratification, value consciousness and novelty seeking. Results are mixed with conflicting findings, depending upon the study considered. Therefore, no global picture emerges.

Besides, most research oppose users and non-users of counterfeits and consider each group 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.

Few studies consider the possibility of a plurality of consumer profiles based on different motivations or characteristics.

Tom *et al.* (1998) proposed 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 good. 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 his major driver despite the difference in quality. An ethical shopper will prefer the genuine product, although he 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 their evaluation of genuine and counterfeit products, it is limited to two dimensions.

Recently, Le Roux *et al.* (2015) proposed a typology of consumers based on their motivations to buy or not counterfeits. Five consumers' profiles were identified using Viot *et al.* (2014) 13 motivational dimensions. Two profiles were 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 corporation and a rejection of the negative economic consequences of counterfeiting for society, companies and brands. For them, counterfeits are attractive alternatives to genuine in terms of price and 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 high possession and 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 and copies that justifies price differences between original items and counterfeits. Besides, they exhibit a mistrust about the origin of counterfeit and reject the ludic or revenge on big corporation justifications of buying fakes. This profile reminds of 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 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 ludicity 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.

In summary, consumers can be conceived as having different motivations regarding counterfeiting and counterfeits. Besides, a consumer may be a buyer or a non-buyer of counterfeits depending upon product category, product attributes and purchase situation. So far, academic research did not investigate the relations between those variables and consumer behavior toward counterfeits.

3. Research objectives

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. 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.

4. Methodology

The data was collected through a questionnaire survey administered to a convenience sample of 170 respondents (male = 31%, female = 69%, age in years: mean = 22.76, SD = 1.81). A sample might limit the generalization of the results to the population of consumers. However,

this research is mostly an experimental study rather than an observational survey. Convenience sampling is difficult to avoid in an experimental method, which requires the availability of individuals in the same place and at the same time. Designing an online manipulation is theoretically possible, but this would introduce an uncontrollable number of potential biases. Adding more respondents would probably increase the power of the tests but would not allow for testing new interactions of factors. Interactions are conditioned by the experimental plan. Moreover, our results do not present any risk of a type II error (lack of power error). Increasing the number of respondents would not change the results. Regarding the unbalanced structure of the sample toward female, the impact of gender on the results has been tested and ruled out. This questionnaire had two parts: a psychometric scale and a trade-off model, both of which are described below.

The impact of product category, product attributes and purchase situation on consumer behavior has been explored through a conjoint analysis methodology. Two product categories were compared: a low risk and less expensive product, an Eastpack backpack; a higher risk and more expensive product with a technological dimension, a Canon digital camera. The perceived risk associated to each product category was 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 *t* test confirms a significant difference in perceived risk for the two selected product categories ($t = 13.039$, $df=169$, $p\text{-value} < 0.001$).

For each of these two product categories, ten variations were built on three attributes: 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). These product attributes correspond to the cues that define a non-deceptive counterfeit in the marketing literature (Bloch *et al.* 1993, Chakraborty *et al.*, 1997; Gentry *et al.*, 2001, 2006).

The stimuli used in the conjoint analysis (see Appendix) involved 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 / on a market*, you are proposed a *Canon digital camera / an Eastpack backpack* for a price of *low / high*. It's a *genuine product / a counterfeit*" (*italics* for variations). The scenario was used to improve the ecological validity of the survey. It is unlikely to encounter a counterfeit in a regular shop in western country, as no distributor would accept to risk its brand image through counterfeit selling. The mention of a foreign setting attempts to account for this aspect. For each product category tested, respondents were asked to rank order the ten cards representing the stimuli. Besides, for each stimulus, a purchase intention measured on a four-point scale (Would you buy this product: 1 = certainly not, 4 = certainly?) was recorded.

Motivation to purchase counterfeits was measured using Viot *et al.* (2014) scale. It includes 39 items that measure 13 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 (ludic dimension of counterfeits, revenge on large corporations, exorbitant price of originals, bargain price of counterfeits, low perceived quality difference between genuine and counterfeits). All items were measured on a six-point Likert scale with 1 representing "strongly disagree" and 6 "strongly agree".

The trade-off part of the data was first analyzed using conjoint analysis. The purpose of the conjoint analysis is to describe and model consumer preferences (Green and Srinivasan, 1990). It allows identifying the attributes a consumer uses to evaluate an object, the relative importance of each one, and the preferred modalities. To cross-validate the attribute preferences expressed in rankings, we then analyzed the ordinal purchase intentions of each stimulus by fitting a Generalized Linear Mixed Model (GLMM, see Agresti, 2013 for details). This type of analysis

has a better support from probability theory and allows for statistical testing of complex hypotheses.

For both techniques, the baseline models were built with three main effects: Product type, Price, and Place of purchase, adding the product category as a moderator. Then, to introduce consumers motivations, we ran a hierarchical cluster analysis using the Ward agglomeration method: a 5-cluster solution proved to be suitable and consistent with the five consumer profiles identified by Le Roux *et al.* (2015). The cluster membership was then added in both trade-off analysis as a categorical moderator variable, to highlight differences in the decision-making determinants.

5. FINDINGS

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.

A. Exploring consumers ranking of stimuli through conjoint analysis

The conjoint analysis computed for each product on the total sample yields a logical hierarchy in variable importance (see Table 1): 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%). A slight difference is observed between the product categories tested: while the hierarchy of importance is clear for the backpack, Price and Place of purchase are closer in importance for the digital camera.

TABLE 1: RESULTS OF CONJOINT ANALYSIS ON TOTAL SAMPLE

Label	Digital Camera			Backpack		
	Utility	Standard Error	Importance (% Utility Range)	Utility	Standard Error	Importance (% Utility Range)
Intercept	5.5144	0.04482		5.4193	0.04281	
Product type genuine	1.8480	0.04340	43.161	1.8518	0.04145	42.980
Product type counterfeit	-1.8480	0.04340		-1.8518	0.04145	
Price low	1.3677	0.04340	31.945	1.6043	0.04145	37.234
Price high	-1.3677	0.04340		-1.6043	0.04145	
Place shop	1.0299	0.05929	24.894	1.0542	0.05663	19.786
Place internet	0.0718	0.07087		-0.4035	0.06768	
Place market	-1.1017	0.05929		-0.6508	0.05663	

The respective utilities of each modality confirm the rationality of respondents: in both product categories, 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 slight difference appears in the product categories regarding the Place of purchase: For the backpack, internet (Utility = -0.40) and the market (Utility = -0.65) are equally rejected. But, 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).

B. Explaining consumers purchase intentions through a Generalized Linear Mixed Model

In this model, the moderating effect of the product category can be estimated directly. 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 2.

TABLE 2: RESULTS OF TYPE III TESTS FOR THE BASELINE GLMM

<i>Type III Tests of Fixed Effects</i>					
<i>Effect</i>	<i>Num DF</i>	<i>Den DF</i>	<i>F Value</i>	<i>Pr > 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	

All main effects are significant and the estimators for the attributes (see Table 3) are those expected: for the backpack, which is used as the reference category, a genuine product is preferred over a counterfeit, a low price over a high price, and a purchase in a store is strictly preferred to a purchase on the internet ($t = 3.24$), which in turn is strictly preferred over the 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.

TABLE 3: RESULTS OF GENERALIZED LINEAR MIXED MODEL

Solutions for Fixed Effects

Effect	Buying intention	Product	Price	Product type	Place	Standard			Pr > |t|		
						Estimate	Error	DF			
Intercept	certainly not					-0.4519	0.1724	338	-2.62	0.0092	
Intercept	probably not					1.5719	0.1753	338	8.96	<.0001	
Intercept	probably					3.5968	0.1932	338	18.62	<.0001	
Product type		counterfeit				3.1994	0.2453	3047	13.04	<.0001	
Product type		genuine				0	.	.	.	.
Price			low			-3.2230	0.1702	3047	-18.94	<.0001	
Price			high			0	.	.	.	.
Place					shop	-0.5761	0.1781	3047	-3.24	0.0012	
Place					market	0.6808	0.1814	3047	3.75	0.0002	
Place					internet	0	.	.	.	.
Price*Product type				low	counterfeit	0.4619	0.1923	3047	2.40	0.0164	
Price*Product type				low	genuine	0	.	.	.	.
Price*Product type				high	counterfeit	0	.	.	.	.
Price*Product type				high	genuine	0	.	.	.	.
Product type*Place					counterfeit	shop	0.2658	0.2380	3047	1.12	0.2640
Product type*Place					counterfeit	market	-0.8696	0.2260	3047	-3.85	0.0001
Product type*Place					counterfeit	internet	0	.	.	.	
Product type*Place					genuine	shop	0	.	.	.	
Product type*Place					genuine	market	0	.	.	.	
Product type*Place					genuine	internet	0	.	.	.	
Price*Place			low		shop	-0.5099	0.1799	3047	-2.83	0.0046	
Price*Place			low		market	0	.	.	.	.
Price*Place			low		internet	0	.	.	.	.
Price*Place			high		shop	0	.	.	.	.
Price*Place			high		market	0	.	.	.	.
Price*Place			high		internet	0	.	.	.	.
Product category		camera				-0.2013	0.2221	338	-0.91	0.3655	
Product category		backpack				0	.	.	.	.
Product category *Price		camera	low			0.4504	0.1531	3047	2.94	0.0033	
Product category *Price		camera	high			0	.	.	.	.
Product category *Price		backpack	low			0	.	.	.	.
Product category *Price		backpack	high			0	.	.	.	.
Product category *Place		camera			shop	0.3295	0.1963	3047	1.68	0.0932	
Product category *Place		camera			market	0.8144	0.2000	3047	4.07	<.0001	
Product category *Place		camera			internet	0	.	.	.	.
Product category *Place		backpack			shop	0	.	.	.	.
Product category *Place		backpack			market	0	.	.	.	.
Product category *Place		backpack			internet	0	.	.	.	.

No three-way interaction was found significant. The moderating effect of the product category is not significant (p -value > 0.5) for the Product type. Regarding the other two-way interactions, some corrections to the main effects can be interpreted.

A significant Product category x 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. Consistently with the latter, a significant Product category x Place interaction shows that the intention to buy a camera on the internet is, relatively to the backpack, closer to the physical shop ($t = 1.68$, p -value > 0.05) and farther to the market ($t = 4.07$). A significant Product type and Place interaction means that a counterfeit is more likely to be bought on 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 and Price interaction indicates that a low price is specially appreciated in a regular shop ($t = 2.83$).

C. Exploring consumers profiles impact on the ranking of stimuli through conjoint analysis

The conjoint analysis was re-run on each of the five consumer clusters, for each product category tested (see Table 4). Results for the digital camera are homogeneous across consumer profiles. All clusters exhibit a clear hierarchy regarding attributes importance: Product type is still the dominant choice criterion, ahead of Price and Place of purchase. However, concerning the backpack, 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. Modalities are as expected with a preference for the genuine over the counterfeit, for a low price over a high one, and for a regular shop over internet over a market.

TABLE 4: 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	.					

D. Explaining consumers profiles purchase intentions through a Generalized Linear Mixed Model

The consumers' profiles have been introduced in 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 5.

TABLE 5: 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	Df	
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	.	.	.

To reduce the burden of the interpretation of estimates, a series of contrast summarize our main findings (see Table 6). Regarding Product type, the total marginal effect of cluster membership clearly opposes Cynics and Activists vs. Rationally reluctant and Emotionally resistant

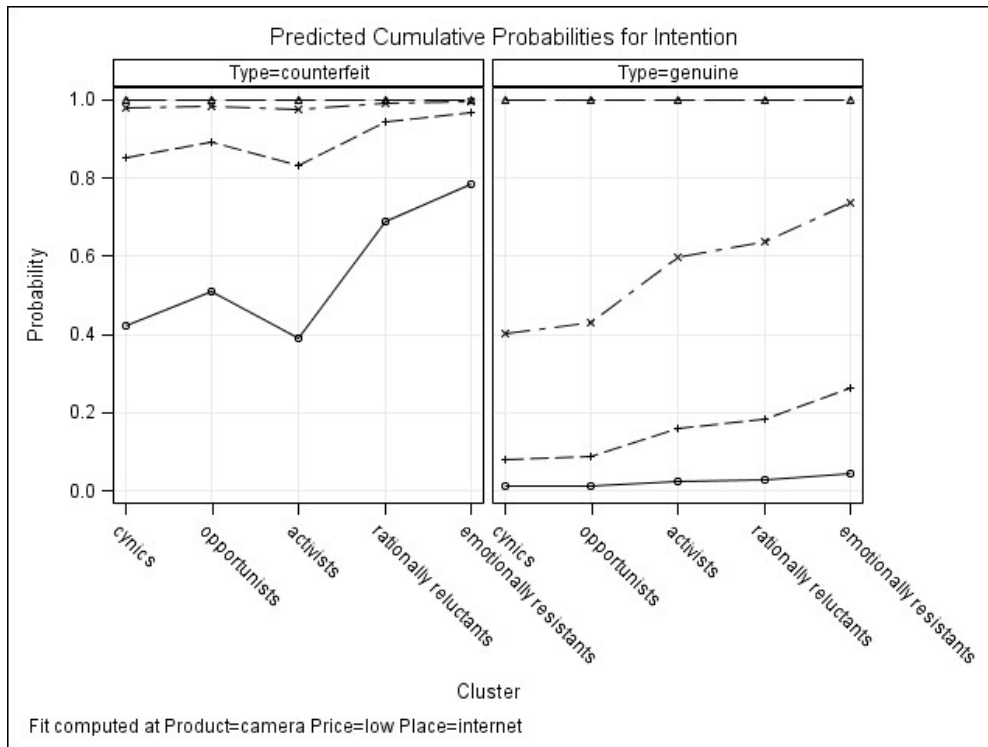
consumers ($t = 3.03$), the former being less opposed to buy fakes, and Opportunists being in between.

TABLE 6: RESULTS OF CONTRASTS BY CLUSTER

<i>Estimates</i>	
<i>Label</i>	<i>Estimate Std. Err. DF t Value Pr > |t|</i>
Cynics & activists vs resitants & reluctants	-0.6595 0.2179 3039 -3.03 0.0025
Cynics & activists vs resitants & reluctants @ low price	-1.1076 0.2345 3039 -4.72 <.0001
Cynics & activists vs resitants & reluctants @ high price	-0.2114 0.2560 3039 -0.83 0.4090
Cynics, activists & opportunistvs vs resitants & reluctants @ low price	-1.0851 0.2034 3039 -5.34 <.0001
Cynics, activists & opportunistvs vs resitants & reluctants @ high price	-0.01099 0.2238 3039 -0.05 0.9608
Activists vs others @ counterfeit	-0.7587 0.3613 3039 -2.10 0.0359
Activists vs others @ genuine	0.3116 0.3343 3039 0.93 0.3514
Cynics & activists vs resitants & reluctants @ counterfeit	-0.9785 0.2588 3039 -3.78 0.0002
Cynics & activists vs resitants & reluctants @ genuine	-0.3405 0.2321 3039 -1.47 0.1424
Cynics, activists & opportunistvs vs resitants & reluctants @ counterfeit	-0.7479 0.2272 3039 -3.29 0.0010
Cynics, activists & opportunistvs vs resitants & reluctants @ genuine	-0.3482 0.2006 3039 -1.74 0.0827

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 ($t = 5.34$). All profiles will buy preferably 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 ($t = 3.29$).

FIGURE 1: PURCHASE INTENTIONS PREDICTED CUMULATIVE PROBABILITIES FOR A DIGITAL CAMERA AT LOW PRICE ON INTERNET ACROSS CONSUMER PROFILES



The figure 1 shows the predicted probabilities of the 4 levels on the intention for the most discriminant case: a camera at a low price on the internet. Knowing that the product is a genuine, a majority of respondents will “certainly” (curve at the top) or “probably” (second from the top)

buy the product, as expected. But, for a non-deceptive counterfeit, only the Rationally reluctant and the Emotionally resistant consumers will “certainly not” (bottom curve) purchase the product.

6. Discussion

This research explores 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), in two product categories (i.e. digital camera and backpack).

These results confirm the literature on consumers' use of Product type, Price and Place of purchase in the definition of their choice criteria and purchase decisions regarding counterfeiting (Bloch *et al.*, 1993; Chakraborty *et al.*, 1997; Gentry *et al.*, 2001, 2006). Whatever the product category is, consumers exhibit a rational behavior with a clear preference for a genuine product over a counterfeit, a low price over a high one, a regular shop over internet over a market. Besides, for both product categories, consumers follow the following buying pattern: they first consider if the product is a genuine or a counterfeit, then if its price is low or high, and finally if the purchase takes place in a regular shop, on internet or on a market.

Still depending upon product category, slight differences appear. A low priced technological or risky product, such as a camera, is less likely to be bought than a low priced mundane one, such as a backpack. In addition, regarding purchase setting, buying a technological and risky product on the internet is more easily accepted. Purchase intentions on internet are closer to those in a regular shop for a camera, than for a backpack. An explanation is that, for electronics, online stores from major retailers are well-established places of purchase. Once the consumer knows that he is facing a counterfeit, his price sensitivity is different. For a genuine, a wide price difference strongly influences his purchase intention. For a counterfeit, a low price will not modify his behavior. Consumer also differs in his sensitivity to purchase setting. Overall, a consumer prefers to buy an object in a regular setting, such as a shop, and exhibits a lower purchase intention on a market. Similarly, he prefers a genuine and is deterred to buy a counterfeit. However, confronted to an overt copy on a market, a consumer is more tolerant, and may buy more easily such a product.

This research also attempts to relate these choice criteria and behaviors to different consumers' motivations profiles. Accounting for different consumers' profiles based on their motivations improves the model. Besides, if consumers considered globally exhibit a clear hierarchy of choice criteria (i.e. Product type ahead of Price and Place of purchase), 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 weight equally 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 choice criterion: i.e. Product type. Therefore, it is not relevant to consider a single consumer behavior regarding counterfeiting without accounting for product category and consumer motivations profile face to counterfeiting. A same consumer 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, 1974) product category, while it will not be accepted in high perceived risk product category. Accounting for product category and consumer profiles is therefore necessary.

Moreover, the results indicate that some consumer profiles may be more sensitive to counterfeiting. Activists and Cynics are less opposed to counterfeits than Rational reluctant and Emotionally resistant consumers. Besides, three profiles express a higher preference for a low price: Opportunists, Activists and Cynics. Therefore, they may be more sensitive to the bargain price of copies.

From an academic standpoint, this research brings new insights about consumer behavior regarding counterfeiting. It pinpoints the importance of considering the purchase setting, product attributes such as price, and product category as important variables in understanding consumers' reactions to counterfeits. It highlights the interactions and explores the relations that exist between consumer profiles, depending upon their motivations, and product-related and situation-related variables.

From a managerial standpoint, this research emphasizes both the importance of the purchase situation and the diversity of consumers when it comes to counterfeiting. 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. Consumers diversity regarding motivations and behaviors face to counterfeits pleas for a diversified and targeted approach to counterfeit warning. Targeted communication campaigns, designed to make the different profiles perceive the drawbacks and dangers of counterfeiting, may help to deter them to buy fakes (Le Roux *et al.*, 2015). Besides, the interactions observed between Profiles and Price or Product type show that three consumers 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.

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

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APPENDIX: STIMULI USED IN THE SURVEY

Produit X

Vous êtes en voyage à l'étranger. Dans un magasin / sur Internet / sur un marché, on vous propose un appareil photo numérique de marque Canon au prix de 156 € / 469 €. C'est un original/une contrefaçon.



Produit X

Vous êtes en voyage à l'étranger. Dans un magasin / sur Internet / sur un marché, on vous propose un sac à dos de marque Eastpak au prix de 16,66 € / 49,99 €. C'est un original/une contrefaçon.

