Consumer tendency to regret: validation of a measurement scale

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Summary : this article documents the development and validation of a six-item consumer tendency to regret (CTR) measurement scale. CTR is conceptualized as a situational personality trait in Mowen's 3M hierarchical personality model, and is defined as the propensity of consumers to experience regret following a decision to purchase or not to purchase a product or service. We carried out a qualitative study (n = 35) based on the critical incident method and eight data sets (n = 3,257), and produced a valid and reliable two-dimensional measurement scale, useful both for practitioners of direct marketing and advertisers.

Key words: Regret, sensitivity to regret, personality trait, 3M model, post-purchase evaluation, decision process, counterfactual thinking, measurement scale, consumer behavior.

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Marketing is essentially centered on the actual sale; hence research on consumer behavior often focuses on factors influencing the decision-making process. However, the emotional state of the subject, immediately after the purchase or non-purchase decision, should not be neglected. In fact, this emotional state determines a more or less favorable and lasting predisposition for a brand or a category of product. This state can be strongly influenced by regret, a negative emotion that accompanies a wide array of decisions.

The aim of this article is to propose a measurement scale of the tendency to regret applied to purchase and consumption decisions that we shall refer to as Consumer Tendency to Regret or CTR. After an overview of existing literature, we will present the approach we used to define the construct. Examination of the validity of our scale will lead us to evoke psychological antecedents and the tendency to regret. Finally, we will conclude with the operational interest of our construct while, nevertheless, emphasizing the inherent limits of a preliminary study on the subject.

1)- PREAMBLE

Regret is a negative emotion, determined cognitively, which arises when an individual observes (or imagines) that he could be in a more favorable situation if he had made a different decision (Zeelenberg, 1999). Among decisions that often induce regret are consumer decisions such as whether to purchase, or not to purchase, a given product or service. Like disappointment, regret is a cognitive emotion resulting from a comparison between a real situation and a situation that could have been. However, unlike disappointment, regret centers the comparison on the decision itself in such a way that the consumer compares what is and what could have been if the decision had been different (Zeelenberg et alii, 1998). In a complete post-purchase evaluation model (Inman, Dyer and Jia, 1997; Taylor, 1997), regret and disappointment are combined to form a global evaluation of the purchase (i.e. satisfaction). In these models, the post-purchase evaluation includes not only an evaluation of the option selected, but also an evaluation of the options not selected1. In this light, the study of regret in marketing is fundamental, especially since this negative emotion can have detrimental consequences (Tsiros and Mittal, 2000; Zeelenberg and Pieters, 1999, 2003). Regret leads to a negative attitude towards a product or service purchased and the merchant. It creates dissatisfaction and reduces the intention of buying the brand again. It can even lead to negative word of mouth.

To sum up, regret has a negative effect on post-purchase evaluation. Nevertheless, existing literature on regret shows that we are not all equal concerning regrets and that there are individual differences that make us more or less sensitive to regret. Low self-esteem (Roese and Olson, 1993), a past temporal orientation (Boninger, Gleicher and Strathman, 1994), pessimism (Kasimatis and Wells, 1995) and a propensity for mental rumination (Davis, 1991) are personality traits that increase sensitivity to regret. Schwartz et alii (2002) have proposed

[1] Satisfaction is therefore apprehended as a wider paradigm than confirmation/disconfirmation (*e.g.* Anderson, 1973) since, in the models of Inman, Dyer and Jia (1997) and Taylor (1997), satisfaction also depends on performance of the options of the consideration set.

a five-item measurement scale for sensitivity to regret. The main limitation of this scale is that it does not distinguish between regrets linked to a decision to act (commission) and regrets linked to a decision not to act (omission), yet this distinction is an important theme in literature on regret (e.g. Gilovich and Medvec, 1995 ; Rajagopal, Sekar and Rao, 2006 ; Tsiros and Mittal, 2000). The second limitation of this scale concerns its use in marketing. Indeed, certain very general items (such as "When I think about how I'm doing in life, I often assess opportunities I have passed up") are not specific to consumer decisions. Thus, there is a need for a precise measurement tool for consumer decisions, capable of detecting the distinction between commission and omission, and developed in French. In this article, we propose the concept of Consumer Tendency to Regret (CTR) as well as a means of measuring it. CTR is designed as a specific application of sensitivity to regret as defined by Schwartz et alii (2002) to consumer decisions.

2)- DEFINITION OF REGRET

Regret is a negative emotion, determined cognitively after a thought process qualified as "counterfactual thinking". Counterfactual thoughts compare a fact (reality) with a counterfact (what reality could have been). They often take on the form of reflections such as "If …then…" When the "if" concerns a decision made by the decision-maker ("If I had taken my umbrella, we could have gone for a walk"), the resulting negative emotion is regret. When the "if" concerns circumstances beyond the speaker's control ("If it had not rained, we could have gone for a walk"), i.e. when responsibility is attributed to an external factor, the resulting emotion is disappointment. Counterfactual thoughts take shape when the subject observes that a situation could have been more favorable than it is. They can also be the fruit of simply imagining what might have been (Kahneman and Miller, 1986). This explains why regret can be the result of either an objective outcome (awareness that another option would have been preferable) or mental simulation (imagining another option would have been preferable).

The literature demonstrates that certain situational conditions encourage counterfactual thinking, and therefore regret. In particular, the intensity of counterfactual thoughts depends on the nature of the decision, whether it concerns an action or an omission. Decisions to act lead to counterfactual thinking more often than decisions not to act because failure to act does not modify the initial situation of the decision-maker (status quo), whereas action breaks with the equilibrium that preceded the decision. It is easier, in the context of mental simulation, to imagine not having acted (when one has acted) than to imagine having acted (when one has not acted) (Kahneman and Tversky, 1982). Moreover, decisions to act induce a more intense feeling of regret than decisions not to act (Gleicher et alii, 1990; Kahneman and Tversky, 1982; Landman, 1987). On the other hand, decisions not to act lead to more lasting regrets than decisions to act (Gilovich and Medvec, 1994, 1995). This state of affairs can be explained by the infinite character of the consequences of omissions compared with the consequences of commissions, which are generally rapidly identified (for an in-depth review, see Rajagopal, Sekar and Rao, 2006).

However, if regrets for acts and omissions differ in their intensity and duration, nothing indicates that the nature of the resulting emotion of "regret" is different. Moreover, we can observe that taxonomies of emotions make no distinction based on the type of decision at the origin of the regret (e.g. Shaver et alii, 1987)... In the same way, if we limit ourselves to the emotions listed in cognitive evaluation theory (Frijda, 1993; Roseman, 1991; Van Dijk and Zeelenberg, 2004), there is no specificity linked with decisions to act or not to act concerning regret.

The nature of regret would therefore be the same in the case of a decision to purchase, or not to purchase, a product or service. This conclusion seems, however, to contradict the findings of numerous other studies, which show that we do not all react the same way when faced with decisions (e.g. Kuhl, 1994; Higgins, 1997, 1998). Certain individuals show a preference for action and others for maintaining the status quo. This distinction seems particularly relevant in marketing where, contrary to other areas studied in psychology, brands and merchants implement strategies aimed at influencing human behavior. We can therefore infer that if the consequences of post-purchase regrets and regrets for not making a purchase are not the same, marketing and communication campaigns in one case or the other will be different. It seems therefore necessary (and justified) to introduce this distinction between purchase and non-purchase in the CTR scale as we clearly situate our research in the field of consumer behavior.

3)- DEVELOPMENT AND VALIDATION OF THE CTR SCALE

In order to develop the CTR scale, we followed the phases prescribed by Churchill (1979) while completing them when necessary. Churchill's paradigm is based on classical test theory (Spearman, 1907; Gulliksen, 1950; Magnussen, 1967) which considers test items as reflexive indicators of the constructs studied. This system is not always relevant, as pointed out by Burke-Jarvis, MacKenzie and Podsakoff (2003, 2005), which is why we have also applied the theory of latent variables (Bollen and Lennox, 1991).

A)- DEFINITION OF THE CONSTRUCT'S DOMAIN AND CHOICE OF ITEMS FOR THE SCALE

Defining Consumer Tendency to Regret (CTR) means questioning the specificity of the construct in relation to a more general tendency to regret decisions. To do this, we used the hierarchical model of personality (Mowen, 2000), taking care not to overlook the question of the dimensionality of the construct.

We define consumer tendency to regret as a personality trait that reflects the frequency of experiences of regret within the context of consumer decisions. The interpretation grid of Mowen's hierarchical 3M Model of Motivation and Personality (Mowen *et alii* 2000) enables us to situate this variable in relation to a more general variable: sensitivity to regret (Schwartz *et alii*, 2002). According to this hierarchical model of personality, there are different levels of personality traits. The so-called basic traits make up the highest and most abstract level of the hierarchy. They are determined genetically and can be identified in the earliest years of life. McCrae and Costa (1987) have selected five dimensions: openness, conscientiousness, extraversion, agreeableness and neuroticism. The second level of the model is made up of composite traits defined by Mowen as stable predispositions that are reflected in a wide array of situations. They are the result of combinations formed between traits on the highest level (i.e. the basic traits), with cultural and environmental factors. The need for cognition or self-esteem are examples of this. The third level includes situational traits resulting from the combined effect of basic traits, composite traits and characteristics particular to the types of situations in which they appear. Mowen (2000) proposes as an example of this type of personality trait the motivation to remain in good health. On the highest level we find surface traits, i.e. those that depend the most on context. The tendency to exercise regularly is one example (Mowen, 2000). A marketing researcher would logically focus on situational traits

(related to opportunities for consumption) and rarely on personality traits on the higher levels, as Baumgartner (2001) rightly points out. In our research, we conceptualize CTR as a situational trait (on the 3rd level of Mowen's scale) particular to consumer situations. On the lower level (surface traits) can be found, for example, the tendency to regret purchases of clothing. At a higher level, this surface trait becomes more generalized, approaching sensitivity to regret as conceptualized and measured by Schwartz et alii (2002). This proposition will be the object of an empirical test later on in the article.

Completely defining our construct means clearly situating it in relation to decisions to act and decisions not to act. In order to check the conceptual relevance of these two dimensions, purchase and non-purchase, we carried out an exploratory study with 35 individuals (average age =35; 14 women and 21 men). Using the critical incident method (Flanagan, 1954), which has already been used to study regret (Zeelenberg and Pieters, 1999), we asked the test subjects to write about a particularly vivid experience of regret. The stories obtained were coded according to whether they were about a purchase or non-purchase decision (on a scale of 1 to 7). Out of the 43 accounts obtained2, 15 concerned regrets following a non-purchase decision and 28 regrets following a purchase decision3. Moreover, the correlation between the declared frequency of regret after a purchase and the declared frequency of regret due to a non-purchase was insignificant ($r = -0.003$, $p = 0.988$). These results seem to confirm the need to introduce a distinction between regrets linked to an action (regret due to a purchase) and regrets linked to an omission (regret due to a non-purchase) into the wording of the items on our measurement scale since the same individual can regret his purchases without regretting his decisions not to purchase and *vice versa*.

In this light, we can therefore question the relation between the two dimensions, $CTR_{purchase}$ and $CTR_{non\text{-}purchase}$, and the higher order construct, consumer tendency to regret (CTR). To do this, we will use the synthesis by Burke-Jarvis, MacKenzie and Podsakoff (2003, 2005) of measurement models used in marketing. The authors use the example of job satisfaction to demonstrate that the unidimensional design of certain marketing constructs is not always relevant. Job satisfaction is made up of several distinct facets that are not necessarily linked, but that all contribute to form job satisfaction. The manner in which we conceive the links between the tendency to regret purchase decisions, tendency to regret non-purchase decisions and the higher-level construct of consumer tendency to regret is analogous. CTR_P and CTR_{NP} are formative dimensions 4 of the construct CTR. This implies for our research (see Burke-Jarvis, MacKenzie and Podsakoff, 2003, 2005) that:

(a) CTR_P and CTR_{NP} are two characteristics that are distinct from CTR.
(b) Changes in the values of CTR_P and CTR_{NP} also cause changes in the construct CTR.
(c) Eliminating one of the two dimensions alters the conceptual domain of the construct CTR.
(d) A change in the value of one of the two dimensions does not necessarily cause a change in the value of the other dimension.
(e) The two dimensions CTR_P and CTR_{NP} do not necessarily have the same antecedents or the same consequences.

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2 There are more accounts than persons questioned because certain subjects wrote more than one account.

3 The more intense post-purchase regrets are more easily recalled, which explains why they were mentioned more often.

4 This does not prevent them from being measured using reflexive indicators.

Using the existing literature and a qualitative exploratory study, we have written 53 reflexive items indicating consumer tendency to regret.

These items were submitted for evaluation to four experts in measurement scales. After examining their answers and comparing their opinions, 15 items presented in Table 1 were finally selected for their coherency with the concept, clarity and absence of redundancy.

Table 1 – CTR items selected by the experts and before refining the scale

- Often, I say to myself that what I have purchased was not the best option on the market.
- When I hesitate between several options, I often end up choosing the wrong one.
- I often say to myself that I shouldn't have purchased this product but another one instead.
- Once I have purchased something, I stop thinking about everything I could have purchased instead.
- After a purchase, I can't help imagining what might have happened if I had chosen something else.
- After a purchase, I can't stop thinking of the different options I had.
- I rarely regret purchasing one product rather than another.
- I often regret not having purchased certain things
- I often think about things I did not purchase but that I should have purchased.
- I often feel like I've passed up an opportunity
- I am the type of person who continues to tell himself for a long time "I should have purchased that!"
- Once I have decided not to purchase something, I don't change my mind
- I am not the type of person who regrets making purchases.
- After a purchase, I always wonder if it was a good idea.
- Often, immediately after a purchase, I feel like I have a weight on my conscience

B)- REFINING OF THE CTR MEASUREMENT SCALE (DATA SETS 1 AND 2)

Two collections of data, from ad hoc samples of 140 and 184 students respectively, were carried out in order to refine the CTR scale using a self-administered questionnaire. We chose to use a 7-point Likert answer format, in keeping with the recommendations of Cox (1980).

An exploratory PCA-type factorial analysis was carried out on the first 140 observations. Three factors whose eigenvalues were superior to 1 were extracted. The factorial structure explains 55 % of the variance. After an oblique rotation (the dimensions had no independence constraints) only the two first dimensions turned out to be interpretable. For the first of these dimensions, the items referred to regret for commissions (regret for purchasing something). The items of the second dimension concerned regret for omissions (regret for non-purchases). These two dimensions are correlated (r = 496; p <

0.001). The third factor was made up of two items (*"Once I have decided not to purchase something, I don't change my mind"* and *"Often, I say to myself that what I have purchased was not the best option on the market"*). Since this third dimension contributed little conceptually and its inter-item correlations were weak (less than 0.3) we decided to eliminate it.

A new factorial analysis was carried out on the 13 remaining items. The item *"Once I have purchased something, I stop thinking about everything I could have purchased instead"*, with a contribution and communality of less than 0.5, was eliminated. The items *"I often say to myself that I shouldn't have purchased this product but another one instead"*, *"After a purchase, I can't help imagining what might have happened if I had chosen something else"* and *"After a purchase, I can't stop thinking of the different options I had"* saturated on both factors at the same time. The wording of these items was both heavy and vague. Moreover, other items that were represented better by the factorial solution also cover the idea of comparing the product chosen and the products that could have been chosen instead. In keeping with the principle of parsimony we decided to eliminate these items.

A third factorial analysis using the refined scale was carried out in order to verify that the factorial structure obtained with the remaining items was satisfactory. The types matrix indicated that all the contributions were now satisfactory (greater than 0.6). The two factors $CTR_{purchase}$ (CTR_P) ($\alpha = 0.78$) and $CTR_{non\text{-}purchase}$ (CTR_{NP}) ($\alpha = 0.79$) explain 43% and 14% of the variance respectively, or 57% of the cumulative variance. Moreover, the two factors turned out to be positively correlated ($r = 0.449$).

A PCA carried out on a second sample of 184 observations confirmed the two-factor structure: $CTR_{purchase}$ (CTR_P) and $CTR_{non\text{-}purchase}$ (CTR_{NP}). Three additional items were nevertheless eliminated from the scale. The items *"When I hesitate between several options, I often end up choosing the wrong one"* and *"I often feel like I've passed up an opportunity"* had communality coefficients and contributions lower than normally admissible standards (0.5). We can observe that these two statements are not limited to consumer decisions. Moreover, the item *"I rarely regret purchasing one product rather than another"* is also poorly represented in the factorial solution, probably due to its inverted wording, creating a double negative that is confusing for the test subject. We therefore eliminated the three items mentioned above from the scale and carried out a new PCA. The 2-dimensional factorial solution (see Table 2, types matrix) enabled us to explain 67% of the variance. The two dimensions, CTR_P and CTR_{NP}, include 3 items each and demonstrate a good level of internal coherency (*alpha* $CTR_P = 0.755$; *alpha* $CTR_{NP} = 0.765$). The *alpha* calculated for the entire scale (*alpha* = 0.769) is evidence of the presence of a common latent variable for these two dimensions, and which also suggests a correlation between CTR_P and CTR_{NP} ($r = 0.374$). Of the 53 initial items, only 6 were finally selected, a weeding out that can appear drastic, but that can be explained by the exploratory nature of our approach, our respect for the principle of parsimony and our desire to confine our construct within the domain of consumer behavior.

Table 2 – Types matrix after Oblimin rotation – Data set 2 – 184 students

	CTR_{NP}	CTR_{P}
I often regret not having purchased certain things	0.864*	
I often think about things I did not purchase but that I should have purchased	0.814	
I am the type of person who continues to tell himself for a long time "I should have purchased that!"	0.793	
After a purchase, I always wonder if it was a good idea		0.851
I am not the type of person who regrets making purchases		0.829**
Often, immediately after a purchase, I feel like I have a weight on my conscience		0.770

* Only values greater than 0.1 are indicated in the table
** This inverted item was re-codified

C)- CONFIRMATION AND STABILITY OF THE FACTORIAL STRUCTURE (DATA SETS 3, 4 AND 5)

Since the first two data collections had been carried out using students, we wanted to confirm the factorial structure of the scale using a more diversified and representative sample. Therefore, we collected data using an online questionnaire. The sample consisted of 1,116 individuals (54% men and 46% women) extracted from an access panel.

After an oblique oblimin rotation, the PCA confirmed the 2-dimensional, CTR_P and $CTR_{NP,}$ structure. As indicated in the types matrix (see Table 3) the items have contributions greater than 0.6 and satisfactory communality coefficients. The two dimensions are moderately correlated (r = 0.25). The Cronbach's *alpha* for the entire scale is 0.71. This remains acceptable for the dimensions CTR_P (*alpha* = 0.65; *rho* = 0.67) and the dimensions CTR_{NP} (*alpha* = 0.72; *rho* = 0.73). The average CTR_P observed in the sample is 2.9 out of 7 and the average CTR_{NP} is 3.5 out of 7, confirming a tendency to regret that is more lasting[5] when a subject decides not to purchase (omission) than when he makes a purchase (commission).

[5] More lasting regrets due to inaction are also cognitively more accessible (Rajagopal Raju and Unnava, 2006) and therefore judged as more frequent *a posteriori*.

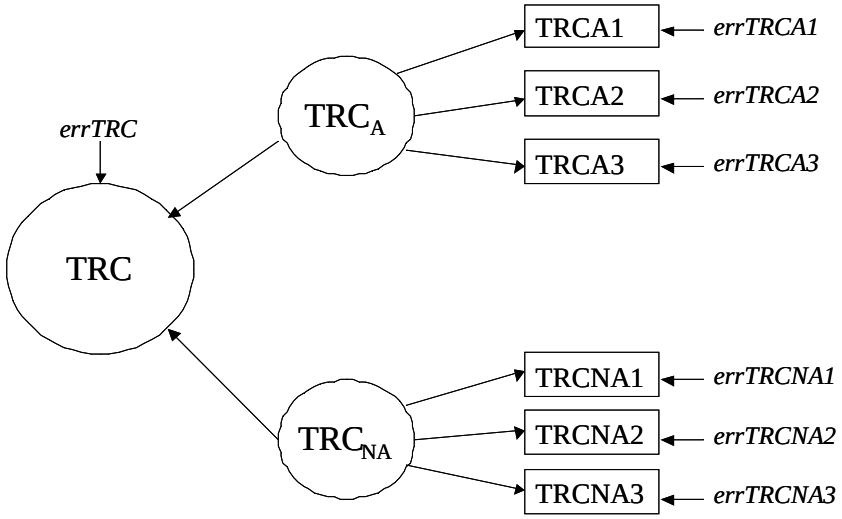
Table 3 – Types matrix after Oblimin rotation – Collection 3 – 1,116 panelists

	CTR_{NP}	**CTR_{P}**
I often think about things I did not purchase but that I should have purchased	0.872*	-0.110
I often regret not having purchased certain things	0.844	
I am the type of person who continues to tell himself for a long time "I should have purchased that!"	0.647	0.227
Often, immediately after a purchase, I feel like I have a weight on my conscience		0.796
After a purchase, I always wonder if it was a good idea	0.114	0.787
I am not the type of person who regrets making purchases	-0.117	0.661**

* Only values greater than 0.1 are indicated in the table
** This inverted item was re-codified

Two confirmatory factorial analyses were then carried out to test the unidimensional character of the construct. The first model established a zero correlation between the two exogenous latent variables CTR_P and CTR_{NP}. The second model is compliant with the type II second-order model described in the typology of Burke-Jarvis, MacKenzie and Podsakoff (2003, 2005). It includes two first-order factors (CTR_P and CTR_{NP}) measured using reflexive indicators and which are formative indicators of a second-order factor (CTR). This second model is shown in Figure 1. In order to test the unidimensionality of the construct, we propose to compare the goodness of fit of data in the two models. The first model puts forward a hypothesis of strong independence between the two dimensions (due to the zero value applied to the correlation). The second model is based on the hypothesis that there is a latent second-order construct (CTR) between the exogenous variables CTR_P and CTR_{NP}; to achieve this we set the values of the parameters at 1 between CTR and, respectively, CTR_P and CTR_{NP}.

Figure 1 – The CTR model tested within the framework of the confirmatory factorial analysis



TRC=CTR ; TRCA=CTRP ; TRCNP=CTRNP

After verifying the hypothesis of the normality of the variables, we estimated the two models[6] using the MLE method (Maximum Likelihood Estimate). The indices of fit between the models to the data are significantly better for the second-order type II model. Of course, the chi-square values remain quite high. For the independence model, the chi-square is 141 and the number of degrees of freedom is 9 (or a ratio of 15.6) whereas for the second-order type II model, the chi-square is 53 and the number of degrees of freedom is 8 (or a ratio of 6.6 for a threshold value arbitrarily set at 2). However, for these two models the GFI and AGFI are greater than the thresholds of 0.9 and 0.8, the highest values being observed once again for the second-order type II model (respectively 0.984 and 0.958 against 0.958 and 0.901 for the independence model). The RMRs are all weak values, the standardized values being less than 0.1 for the second-order type II model only. Finally, for this last model, the CAIC value (parsimony index) is lower than that of the saturated model, which is not the case of the independence model. The regression coefficients are all significant: the values of parameters between the measurement variables and the latent concepts CTR_P and CTR_{NP} divided by the standard deviations (critical ratios) are all greater than 1.96 (rejection of the null hypothesis at a threshold of 5 %). These elements appear to indicate that the second-order type II model in the typology of Burke-Jarvis, MacKenzie and Podsakoff (2003, 2005) fits better with the data than the independence model, which is confirmed by the test of the difference in chi-square between the two: the difference in chi-square (with a value of 88 for a difference in degrees of freedom of 1) is statistically significant at a threshold of 5% ($p = 0.00$).

To study the stability of the factorial structure of the CTR construct, we compared the results obtained from two other data sets, also carried out with an online access panel (data sets 4 and 5). The CTR scale was administered to 438 and 937 online panelists

[6] With the software programme AMOS by SPSS.

respectively, representative of the French population according to criteria such as sex, age and socio-professional categories. Strictly speaking there is no statistical criterion that can be used to prove that two factorial structures are identical. However, the PCA carried out on each sample produced very similar results. In both cases, the two first axes, the eigenvalues of which are greater than 1, account for approximately 66% of the total variance, the first accounting for nearly 48% and the second 18%. The correlation between the axes is respectively 0.33 and 0.39 ($p = 0.00$), two values that are very close. The analysis of the types matrix, after oblique rotation, reveals that the two axes are explained by the same items with contributions all greater than 0.6, and often close to 0.8, which are comparable for both data sets. The three items of the first axis concern the tendency to regret omissions (CTR_{NP}) and the three items linked to the second axis describe the tendency to regret commissions (CTR_{P}), according to an identical hierarchy for the two data sets. The coefficients for Cronbach's *alpha* calculated for each dimension (CTR_{NP} and CTR_{P}) and globally for the scale are respectively 0.79, 0.66 and 0.77 for data set 4 and 0.80, 0.65 and 0.76 for data set 5, values that are high and very close. We conclude that the factorial structure of the CTR construct is stable as the results obtained were quite comparable when we questioned two different samples on two different dates.

It is important to underline the fact that the structure of the two-dimensional construct can be identical even though the CTR scores of the individuals tested are not comparable. The stability of the factorial structure is a necessary but insufficient condition for the stability of the psychological trait in the individuals questioned. To test this point, we carried out two typological analyses of data sets 4 and 5 using the factorial scores. In both cases, we obtained two groups with very similar barycentric coordinates. The weight of the groups was also comparable with each class counting 48% and 52% of subjects respectively in the first sample and 45% and 55% in the second sample. The typology contrasts two types of behavior. The first group is made up of individuals who strongly regret their purchases, but also the fact that they have not made purchases. Their factorial scores for the dimensions CTR_{NP} and CTR_{P} indicate intense psychological tension. On the contrary, the second group comprises individuals who have very low CTR scores. Their factorial scores were low for each constitutive dimension of CTR_{P} and CTR_{NP}. It therefore seems that the propensity to regret is a personality trait that divides the population into two classes (of equal size) according to the intensity of regret experienced. It is interesting to note that in the two data sets, women were significantly more numerous than men to regret their purchase decisions. This negative emotion is also more pronounced for young adults (under 34) than for senior citizens (55 and older). This tendency to regret is, however, strongly modulated by the subject's social class: higher socio-professional categories felt less regret than middle categories due to higher revenues and therefore lower financial risk in the event of a bad purchase decision.

In the end, the different analyses indicate a good level of stability for the factorial structure of our measurement scale. The typology carried out on the factorial scores demonstrates that the individuals belong to two opposite classes, according to the intensity of regret experienced, the CTR_{P} and CTR_{NP} dimensions apparently working together. Moreover, the discriminant character of certain explicative variables (sex, age and socio-professional category) concerning the tendency to regret purchase decisions provides our measurement instrument with a highly operational dimension for marketing practitioners.

D)- VALIDATION OF THE CTR SCALE

The validity of the construct reflects the goodness of fit between the construct and the measures. The convergent validity and the discriminant validity can be used to determine whether the data measured is particular to the construct studied (and not the measure of another construct or a measurement error). Once this phase is validated, we must also make sure the measurement behaves in accordance with the theory (nomological validity).

CONVERGENT AND DISCRIMINANT VALIDITY

Evaluating the convergent validity of a measure consists in ensuring that it is closely correlated with another means of measuring the same construct. Testing the discriminant validity aims, on the contrary, to demonstrate that two measures of theoretically different constructs are not correlated. In order to validate the two-dimensional structure of CTR, we tested the convergent and discriminant validity of each of the two dimensions, CTR_P and $CTR_{NP,}$ comparing one to the other[7]. To do this, we used two complementary methods: one method inspired by the multi-trait multi-method (MTMM) matrix proposed by Campbell and Fiske (1959) and another method based on structural equations introduced by Fornell and Larcker (1981).

The MTMM matrix (Campbell and Fiske, 1959) is based on the analysis of correlations between different and similar traits, measured using different methods. The approach that we adopted to test the two-dimensional structure of CTR is quite similar in that it aims to analyze the correlations between the two dimensions of the scale using two different measurement methods. A sample of 157 individuals was subjected, on two occasions, to an online questionnaire including the CTR scale. During the first collection of data, the answer format of the CTR scale was a 7-point Likert scale, each item presented on line as a radio button. During the second collection of data, the answer format for the CTR scale was a cursor that the respondent had to move along a graduated scale (the position of the cursor indicating the score attributed). The extreme ends of the scale were labeled with the same items as the Likert scale. The comparison therefore concerns two different scales (ordinal *versus* continuous) and different presentations on the screen (radio buttons *versus* cursor). 5 aberrant or incomplete observations were eliminated from the sample. The analyses therefore were carried out on the 152 remaining observations. For practical purposes, the interval between collections was two years, which reduces the scope of the correlations obtained compared to a double measurement during a single session. This said, the correlations have an acceptable level and the values measured with the same subjects after a relatively long period of time seems to indicate a good level of stability of the construct as a personality trait. Contrary to the recommendations of Campbell and Fiske (1959), we did not carry out a true test-retest since the measurement at time t_2 was carried out using a different method than the measurement at time t_1. Thus, in the reliability diagonal of our matrix (mono-trait, mono-method), we have indicated the values of *alpha*, which is an indicator of internal coherency and therefore gives and indication of the correlation of the test with itself (*e.g.* Cortina, 1993).

[7] Our convergent and discriminant validation approach therefore concerns the dimensionality of the CTR scale.

Table 4 – MTMM matrix of the CTR scale

		Method 1 - Likert		Method 2 - Cursor	
		CTR_P	CTR_{NP}	CTR_P	CTR_{NP}
Method 1 - Likert	CTR_P	*0.646*			
	CTR_{NP}	*0.345**	*0.765*		
Method 2 - Cursor	CTR_P	*0.647**	*0.363**	*0.633*	
	CTR_{NP}	*0.376**	*0.606**	*0.449**	*0.798*

* Correlations are significant at a threshold of 0.01

Analysis of the correlations of the reliability diagonal shows that CTR_{NP} has a reliability level that is acceptable for an exploratory scale. On the other hand, internal coherency for the CTR_P facet, although satisfactory, is disappointing. The inverted wording of the item *"I am not the type of person who regrets making purchases"* is probably behind this weakness of internal coherency.

The mono-trait hetero-method (MTHM) diagonal provides an indication of the convergent validity of the construct. Two different measurements of the same trait should be closely correlated. To confirm the convergent validity of a measure, the correlations of the convergent validity diagonal must be greater than those of the hetero-trait mono-method triangles, *i.e.* the effect of the method must not override the effect of the construct. The values of the convergent validity triangle for CTR_P and CTR_{NP} are respectively 0.65 and 0.61. These values are greater than the discriminant validity values (r (CTR_P Likert, CTR_{NP} Likert) = 0.34 and r (CTR_P Cursor, CTR_{NP} Cursor) = 0.45). These results indicate that each of the two dimensions, CTR_P and CTR_{NP}, demonstrate good convergent validity whether they are measured using a Likert or continuous scale.

The hetero-trait mono-method (HTMM) block provides an indication of the discriminant validity of the construct. Two different traits, measured using the same method, should be moderately or slightly correlated. It is recommended that, on the one hand, correlations of the HTMM block be lower than those of the convergent validity diagonal (two measurements of a single trait made using two different methods should be more closely correlated than two measurements of different traits made using a single method). This condition was checked during the examination of convergent validity. On the other hand, it is also recommended that correlations of the convergent validity diagonal be greater than the correlations of the HTHM blocks. This condition was also checked and the values of the convergent validity diagonal (r (CTR_PLikert, CTR_PCursor) = 0.65 and r (CTR_{NP}Likert, CTR_{NP}Cursor) = 0.61) are greater than the values of the HTHM blocks (r (CTR_PLikert, CTR_{NP}Cursor) = 0.376 and r (CTR_PCursor and CTR_{NP}Likert) = 0.363).

The aforementioned analysis is evidence of the two-dimensional nature of the scale: CTR_P and CTR_{NP} form distinct dimensions. Nevertheless, like all validation methods, these methods are based on correlations that do not provide absolute proof of the convergent and discriminant validity of a measurement instrument. They can only provide indications of these two validities. Therefore, we have completed our analysis by using structural equations according to the method prescribed by Fornell and Larcker (1981).

Fornell and Larcker's approach (1981) compares the percentage of variance a latent variable (CTR_P for example) shares with its measurement items with the percentage of

variance it shares with other latent variables (CTR_{NP} for example). When a latent variable shares more than 50 % of its variance with its measurement items, we can confirm the convergent validity of the measure. When the percentage of common variance between the two latent variables is lower than the average percentage of variance that the latent variable shares with its items, we can confirm its discriminant validity. Table 5 provides the convergent and discriminant validity coefficients for the samples used to develop the CTR scale: one sample of 324 students[8] (Likert format), one sample of 1,116 non-students (Likert format), one sample of 499 non-students (Likert format) and one sample of 938 non-students (cursor format).

Table 5 – Evaluation of convergent and discriminant validities using the method developed by Fornell and Larcker (1981)

	Sample 1 324 students	**Sample 2 1,116 consumers**	**Sample 3 499 consumers**	**Sample 4 938 consumers**
Format of the scale	Likert	Likert Radio button	Likert Radio button	Continuous cursor
Reliability coefficient of the CTRp factor	0.75	0.66	0.67	0.67
Reliability coefficient of the CTRnp factor	0.75	0.75	0.82	0.81
% of variance between CTRp and its measures	0.50	0.40	0.41	0.43
% of variance between CTRnp and its measures	0.51	0.49	0.60	0.58
Convergent validity coefficient	Yes, just barely for CTRp (0.51 > 0.50) and for CTRnp (0.50)	No for CTRp (0.42 < 0.50) Yes, just barely for CTRnp (0.50)	No for CTRp (0.42 < 0.50) Yes for CTRnp (0.60 > 0.50)	No for CTRp (0.43 < 0.50) Yes for CTRnp (0.58 > 0.50)
% of variance between CTRp and CTRnp	0.31	0.21	0.12	0.14
Discriminant validity	Yes because 0.50 and 0.51 > 0.31	Yes because 0.40 and 0.49 > 0.21	Yes because 0.41 and 0.60 > 0.12	Yes because 0.43 and 0.58 > 0.14

For all the data sets, the reliability of the two-factor, CTR_P and $CTR_{NP,}$ structure has been established: the Fornell and Larcker (1981) reliability coefficients are all greater than the threshold value of 0.50. The convergent validity was systematically established for the CTR_{NP} factor since the percentage of variance shared between the factor and its measures is greater than 0.50 (or just barely equal as in sample 2). The variance captured by the factor is greater than or equal to the variance that can be attributed to the measurement error. These results were not confirmed in the case of the CTR_P factor, the variance shared between the factor and its measures being situated below the threshold of 0.50 (and equal to the same threshold for the first data set only). On the other hand, discriminant validity is strong, since the average variance shared between the factor and its measures is consistently greater than the variance shared between the two factors. These results, which are satisfactory for a preliminary exploratory approach, also are evidence of the two-dimensional structure of the CTR construct.

[8] The sample of 324 students was produced through the merging of two samples of 140 and 184 respectively presented in the section concerning the refining of the scale.

NOMOLOGICAL VALIDITY

The second phase of our validity analysis concerns the nomological validity of the CTR scale. The objective was to confirm that the scale "behaves as it should", in other words, that our construct covaries with other constructs to which it is linked by the underlying theory. To confirm this, hypotheses drawn from existing literature were formulated and tested. If a majority of these hypotheses are validated then we can confirm the nomological validity of the scale. It is important to note that certain hypotheses are particular to each of the dimensions CTR_P and CTR_{NP} while others are common to both, taking into account the remark of Burke-Jarvis, MacKenzie and Podsakoff (2003) according to which two dimensions of a single construct do not necessarily have the same antecedents or the same consequences.

To carry out these nomological validity tests, two data sets were needed (*cf.* Table 6).

Table 6 – Complementary data sets used for the nomological validity studies

N° of respondents	Quality of respondents	Average age	% Men / Women	Measures collected
115	Adults Non-students	39	34% / 66%	CTR, Sensitivity to regret (Schwartz *et alii*, 2002), Procrastination (Darpy, 2003), Compulsivity (D'Astous, Valence and Fortier, 1991)
164	Students	22	38% / 62%	CTR, Self esteem (Rosenberg, 1965)
163	Students	22	34.5% / 65.5%	CTR, Materialism (Richins and Dawson, 1992)

The two facets, CTR_P and $CTR_{NP,}$ were defined as manifestations of a more general predisposition to regret purchase decisions. For certain individuals who, when faced with a decision, tend to act rapidly, the propensity for regret takes on the form of CTR_P. For others who, faced with a decision, tend not to act and postpone making a decision, regret takes on the form of CTR_{NP}. It follows that the tendency to regret purchases (CTR_P) should correlate positively with a propensity for impulse buying and the tendency to regret decisions not to buy (CTR_{NP}) should correlate positively with the tendency to procrastinate and put off purchase decisions. In order to measure compulsiveness (*i.e.* propensity for impulse buying) we have chosen the scale by D'Astous, Valence and Fortier (1989), which presents good psychometric qualities for our sample (*alpha* = 0.89). Procrastination was measured using the scale by Darpy (2002), chosen for its parsimony (4 items) and its robustness, having been solidly documented in a French language context (also with an *alpha* of 0.70 for our sample).

The analysis of correlations between CTR_P and CTR_{NP} shows that the tendency to regret purchases (CTR_P) correlates with impulsivity ($r = 0.399$; $p < 0.01$) whereas the tendency to regret non-purchases (CTR_{NP}) does not ($r = 0.049$, NS). Moreover, the tendency to regret non-purchases (CTR_{NP}) correlates with procrastination ($r = 0.241$; $p < 0.05$) whereas the tendency to regret purchases (CTR_P) does not ($r = -0.005$; NS). These results show that, in keeping with our hypotheses, impulsive individuals tend to regret their purchases whereas procrastinators tend to regret postponing purchases, a first phase in the nomological validation of our measurement scale.

Another approach consisted in studying the relation between CTR and other personality traits that are theoretical correlates. We have conceptualized CTR as a situational personality trait within Mowen's 3M model (2000), *i.e.* the result of the combined action of several higher-order traits. Three of these (without excluding the possibility of others) seem to be strongly related to our construct. The first concerns the general tendency to regret decisions (*i.e.* sensitivity to regret) which our construct specifically adapts to consumer decisions. We expected, therefore, to find a positive correlation between sensitivity to regret and the two dimensions of CTR. The second trait that was of interest to us stems from the construct's field of application, which is the purchase of goods and services: materialism. Our hypothesis is that people particularly attached to things (*i.e.* materialists) are more likely to regret purchase or non-purchase decisions than people who are less materialistic. The third personality trait, self-esteem, is a variable whose influence on counterfactual thinking and regret has been demonstrated on several occasions in the literature (Roese and Olson, 1993; Kasimatis and Wells, 1995). People with low self-esteem are more likely to question their decisions and fail to develop successful self-protection strategies. Thus, self-esteem should correlate negatively with the two dimensions of CTR. From this point of view, the combined action of the tendency to regret decisions in general, materialism and low self-esteem leads to a particular sensitivity to regret consumption. A measurement of general sensitivity to regret has been proposed by Schwartz *et alii* (2000). The 5 items of the sensitivity to regret scale have been translated into French by two translators. Since the proposed translations were quite close we did not need to organize a concertation meeting. The unidimensional structure of the sensitivity to regret scale was confirmed. The *alpha* reached a value of 0.62, which is moderate but acceptable. To measure materialism, we decided to use the scale developed by Richins and Dawson (1992). The original version of this scale includes 18 items in English. Two professional translators worked on the items independently. A concertation meeting enabled us to decide between conflicting translations. A pre-test of this last scale, presented in Appendix A1, enabled us to reduce it to 10 items, making it easier to administrate. The *alpha* for the scale was 0.79 and 0.69 for our pre-test and test samples. For self-esteem we used Rosenberg's scale (1965) which includes 10 items and presents good psychometric qualities for our sample (*alpha* = 0.87). Scores for sensitivity to regret, materialism and self-esteem were established and their correlations with the facets CTR_P and CTR_{NP} were calculated. The results show that CTR_P and CTR_{NP} are both significantly and positively correlated with sensitivity to regret (with correlation coefficients of respectively 0.641 and 0.549; $p < 0.001$) and materialism (with correlation coefficients of respectively 0.222; $p < 0.01$ and 0.17; $p < 0.05$). In the same way and in keeping with our hypotheses, the two facets CTR_P and CTR_{NP} are significantly and negatively linked to self-esteem (with correlation coefficients of respectively –0.205 and –0.206; $p < 0.01$). Since the three personality traits examined in relation to our construct were not measured with the same individuals, it is not possible to measure the reciprocal interactions with the two dimensions of CTR, a promising approach for future research.

4)- LIMITATIONS AND AVENUES FOR FUTURE RESEARCH

Our measure of consumer tendency to regret presents satisfactory psychometric qualities. Our analyses demonstrate that the scale presents a two-dimensional structure that can be reproduced from one sample to another and internal coherency coefficients (*alpha* and *rho*) that attain acceptable levels for an exploratory study. The two dimensions of the scale have displayed good convergent and discriminant validity, a conclusion reinforced by the use of

two different methods, one based on correlations between dimensions of the scale and a second method based on structural equations…Moreover, our scale appears to present good nomological validity, since the relation with other concepts with which our construct is theoretically correlated has been established in several cases: the more general tendency to regret decisions, propensity for materialism, self-esteem, procrastination and compulsivity. Of course, this result is only an indication of nomological validity and not irrefutable proof. These encouraging results, however, incite us to voice certain reservations. We will present them as the limitations of our research, but also as an invitation to pursue other avenues of improvement.

The first limit concerns a possible measurement distortion. Our scale has a weak point: the negative wording of one of its items. If all the validation criteria are satisfactory in light of the decision criteria normally selected, some of them are apparently weakened by the presence of the item *"I am not the type of person who regrets making purchases"*. Two opposite positions are defended in the literature. Certain authors prescribe introducing both positive and negative items in the measures (Cronbach, 1950; Likert, 1932) in order to avoid acquiescence response bias which incites respondents to agree with items without regard to their content (Anastasi and Urbina, 1997). Others underline the problems associated with this practice. In particular, the negatively worded items often introduce distortion, *i.e.* they present a situation that has no reason to exist (McPherson and Mohr, 2005; Schotte *et alii*, 1996; Spector *et alii*, 1997). This phenomenon is added to the difficulty a majority of respondents have in apprehending negative statements and double negatives (Marsh, 1996). This bias is potentially present in our negative item. Rewording the item (or abandoning it altogether) would probably improve the psychometric qualities of the scale, in particular its internal coherency.

Other limitations concern the validation process for the measurement instrument. In our validation matrix, we have not carried out a test-retest, an approach which could have reinforced our conclusions on the reliability of our instrument independently of the measurement format (Likert or continuous cursor). Moreover, the MTMM matrix as introduced by Campbell and Fiske (1959) requires the use of very different methods, in order to maximize the variance between methods, which is not the case here. Finally, we could have improved our tests of discriminant validity by including in the analysis a measure from a supplementary construct theoretically not linked to CTR. Our approach is not as strict and thorough as the MTMM matrix developed by Campbell and Fiske (1959). However, we did duplicate the approach for convergent and discriminant validation by using the method recommended by Fornell and Larcker, an essential precaution in this context.

A third limitation is linked to the status of the CTR variable at the heart of a more general personality model. We have made proposals for the status of the CTR variable in relation to sensitivity to regret, *i.e.* the tendency to regret decisions in general. Using Mowen's 3M model (2000), we were able to establish links between three general personality traits (sensitivity to regret, materialism, and self-esteem) and our specific trait in the domain of consumer behavior. The relations measured are significant and compliant with the hypotheses derived from the theory. However, we were not able to study the interactions between these four variables due to the absence of a single data collection. Moreover, other personality traits among those identified by Mowen are probably also linked to regret. As in Mowen's work (*e.g.* Mowen and Carlson, 2003; Mowen and Sujan, 2005), it would be interesting to develop a complete hierarchical model for regret. This model could include basic traits (such as conscientiousness, neuroticism and materialism), composite traits (need for cognition, self-

esteem, locus of control, sensitivity to regret) and the situational trait CTR as well as its consequences.

This final point linked with the consequences of the tendency to regret on the decision process and on post-purchase evaluation is an important avenue of research. Do consumers who often regret their purchases return or exchange their purchases more often? Is it possible to incite consumers who often regret their non-purchase decisions to buy without taking the risk of provoking post-purchase regret? Do consumers with a strong propensity for regret anticipate regret when making a choice? Do they perceive this decision as more difficult or risky? If need be, what are the most efficient means of reducing these risks? Future research should concentrate on answering these questions in order to reinforce the utility of the construct in a managerial context and identify marketing practices that can prevent feelings of regret for these individuals.

Finally, our research reveals a phenomenon which is the frequency of post-purchase and non-purchase regrets for certain individuals, but does not provide an explanation of the cognitive mechanisms. This leads to two avenues of research:

- Exploring the links between CTR and counterfactual thinking: is CTR linked to a propensity for "if then" type thoughts? If this is the case, what is the nature of these counterfactual thoughts and their link with the locus of control[9]? The tendency to regret seems to have two antecedents: a disposition for counterfactual thinking and an internal locus of control. On the other hand, a disposition for counterfactual thinking accompanied by an external locus of control would produce a different trait: propensity for disappointment. Tendency to regret and tendency to be disappointed would explain why certain people are forever dissatisfied.

- Understanding the links between CTR and strategies to reduce cognitive dissonance: is CTR linked to inefficiency of strategies to reduce cognitive dissonance? According to Festinger (1957) and Walster (1964) regret is a state of dissonance that occurs immediately after the decision process. It is characterized by the fact that immediately after the choice, the perceived attractiveness of the selected option diminishes while the perceived attractiveness of the rejected option increases and exceeds it. It is this unfavorable gap between the option selected and the option not selected that gives rise to regret. Faced with this dissonance, the decision maker is motivated to reduce the gap between the selected option and the rejected option, either by searching for information allowing him to upgrade the perception of the selected option, or by searching for information allowing him to deteriorate the perception of the rejected option. The appearance of regret results from the failure of these strategies to reduce dissonance and CTR could be explained by an inability to set up efficient strategies for reducing dissonance. Identifying the mechanisms of this difficulty in efficiently reducing dissonance is a promising avenue of research that could provide solutions for managing regret.

[9] We must remember that regret is linked with internal attributions of responsibility whereas disappointment is linked to external attributions.

5)- CONCLUSION

This research has enabled us to introduce a new individual characteristic, consumer tendency to regret, in the field of marketing. Following Baumgartner's recommendations (2002), CTR was conceptualized at the center of a complete personality model (Mowen's 3M model) and its links with a more general tendency to regret decisions were explored. Thanks to a new measurement tool, the CTR scale, it is possible to distinguish consumers who have a tendency to regret their purchase decisions from consumers who tend to regret non-purchase decisions. According to our results, the first group is made up of more impulsive buyers whereas the second group has a tendency to procrastinate. We have also shown that these two profiles are characterized by a high degree of materialism and low self-esteem.

The interest of the construct and its measure resides in potential use by marketing practitioners. Recent studies demonstrate that the consumer is a complex individual whose purchasing behavior is more and more unpredictable and cannot be explained by profile variables alone. In this light, the tendency to regret purchases (or to not make purchases) can provide an additional explanatory dimension and the highly operational character of our 6-point measurement scale makes it an instrument that is easy to use. A more relevant use of relational databases could be envisaged, providing that the subscribers were qualified according to their tendency to regret their consumer behavior. When this type of qualification is not possible, the results of our research reveal that women, young people, middle and lower socio-professional categories are the groups most likely to experience regret. These results are an indication for practitioners, who target groups with one of these characteristics, that regret is probable. It is important, in order to reinforce the managerial interest of the research, that future researchers concentrate on the interaction between the CTR personality trait and characteristics of the situation (such as, for example, the degree of involvement).

Once the targets and situations at risk have been identified, marketing operations can be planned upstream and downstream of the decision. Upstream, since consumer tendency to regret prevents "risky" purchases, either financially or psychologically, several strategies could be envisaged. A brand could decide to develop a targeted approach only for clients with a propensity for post-purchase regret, consisting in a public relations program based on reassurance, exchange or reimbursement in case of dissatisfaction. On the other hand, to address prospective customers who tend to regret not buying, a brand could use testimonials from satisfied customers to exacerbate frustration due to inaction or develop short-term promotional programs. After the decision, marketing operations should concentrate on facilitating implementation of strategies to reduce dissonance. These actions should aim to reduce the perceived gap between the attractiveness of the selected and rejected options by, for example, reassuring the customer as to the characteristics of the product purchased. It is therefore probably in the area of advertising that our research can make its strongest contribution. The advertiser's job has always been to convince undecided consumers to buy a product or subscribe to a service. Among these undecided consumers are those whose hesitation to buy is exacerbated by their tendency to regret purchases. We can imagine that a brand, that would count among its potential customers a strong proportion of subjects that anticipate (or endure) post-purchase regret, could opt for a reassuring message, multiplying proof of satisfaction, recognition by experts or guarantees.

APPENDIX A1 – Measure of materialism: translation of the Richins and Dawson (1992) scale.

Table 7 shows the items and their translation according to the procedure described in the article.

Table 7- Translation of the materialism scale (Richins and Dawson, 1992)

Items	Items in English	French translation
Item 1	*I admire people who own expensive homes, cars and clothes*	J'admire les personnes qui possèdent des maisons, des voitures et des habits qui coûtent cher
Item 2	*Some of the most important achievements in life include acquiring material possessions*	Parmi les choses les plus importantes de la vie, il y a l'acquisition de biens matériels
Item 3	*I don't place much emphasis on the amount of material objects people own as a sign of success (rev)*	Je ne considère pas l'accumulation d'objets matériels comme un signe de succès
Item 4	*The things I own say a lot about how well I am doing in life*	Les choses que je possède en disent beaucoup sur la façon dont je réussis dans la vie
Item 5	*I like to own things that impress people*	J'aime posséder des choses qui impressionnent les gens
Item 6	*I don't pay much attention to the material objects other people own (rev)*	Je n'accorde pas beaucoup d'attention aux biens matériels que possèdent les autres
Item 7	*I usually buy only the things I need (rev)*	Généralement, je n'achète que les choses dont j'ai besoin
Item 8	*I try to keep my life simple, as far as possessions are concerned (rev)*	J'essaie de mener une vie simple, en ce qui concerne ce que je possède
Item 9	*The things I own aren't all that important to me (rev)*	Les biens que je possède ne sont pas si importants que ça pour moi
Item 10	*I enjoy spending money on things that aren't practical*	J'aime dépenser de l'argent pour acheter des choses qui ne sont pas utiles
Item 11	*Buying things gives me a lot of pleasure*	Acheter des choses me procure beaucoup de plaisir
Item 12	*I like a lot of luxury in my life*	J'aime mener une vie luxueuse
Item 13	*I put less emphasis on material things than most people I know (rev)*	J'accorde moins d'importance aux biens matériels que la plupart des gens que je connais
Item 14	*I have all the things I really need to enjoy life (rev)*	Je possède toutes les choses dont j'ai besoin pour être vraiment heureux
Item 15	*My life would be better if I owned certain things I don't have*	Ma vie serait meilleure si j'avais certaines choses que je n'ai pas
Item 16	*I wouldn't be happier if I owned nicer things (rev)*	Je ne serais pas plus heureux si je possédais de plus belles choses
Item 17	*I'd be happier if I could afford to buy more things*	Je serais plus heureux si j'avais les moyens de m'acheter plus de choses
Item 18	*It sometimes bothers me quite a bit that I can't afford to buy all the things I'd like*	Cela me dérange parfois de ne pas pouvoir acheter certaines choses dont j'ai envie

The scale was then retested on a sample of 87 students. A principal components analysis was carried out on all the observations. Six factors with an eigenvalue greater than 1 were extracted. An analysis of the correlations matrix, Cronbach's *alpha* and of the saturation and communality coefficients led us to eliminate 8 items. This selection can seem drastic, but we wanted to obtain the shortest and least redundant scale possible. The ten items we finally selected were again subjected to a principal components analysis. The saturation of items on their factor is provided in the matrix of components after rotation (see Table 8). The communality coefficients are all greater than 0.5, indicating therefore a minimum of 50% of the variance is taken into account by the factorial structure. The analysis of Cronbach's *alpha* indicates good internal coherency of the scale (*alpha* = 0.82).

Table 8 – Components matrix after rotation of the materialism scale (Richins and Dawson, 1992)

	Happiness Dimension	Success Dimension	Centrality Dimension
I have all the things I really need to enjoy life	0.801		
My life would be better if I owned certain things I don't have	0.799		
I wouldn't be happier if I owned nicer things	0.776		
I'd be happier if I could afford to buy more things	0.746		
Some of the most important achievements in life include acquiring material possessions		0.845	
I admire people who own expensive homes, cars and clothes		0.844	
I don't place much emphasis on the amount of material objects people own as a sign of success		0.630	
I usually buy only the things I need			0.883
I try to keep my life simple, as far as possessions are concerned			0.726
I enjoy spending money on things that aren't practical			0.690

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