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An Application of the Consumer Disposition toward Satisfaction Scale for a-Priori Segmentation

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Abstract: In this study, an a-priori latent segmentation procedure is proposed, which is based on an adaptation of the Consumer Disposition toward Satisfaction (CDS) scale to the Italian social environment. The disposition level is then used to define clusters of the respondents to the Customer Satisfaction annual survey concerning the Italian banking system. In order to verify the evidence of a proper classification the multivariate test of homogeneity is suggested.

Key words: Consumer Disposition toward Satisfaction (CDS) scale, Customer Satisfaction (CS), Latent segmentation, Structural Equation Models (SEM), Partial Least Squares (PLS)

THE CONCEPT OF MARKET SEGMENTATION

Market segmentation is a key element in marketing analysis and planning, which enables one to recognize the unobserved heterogeneity of customers (Johnson and Gustafsson, 2000). The recent research provides Marketing people with new techniques for segmentation, mainly related to the availability of the so-called segmentation basis, i.e. a set of variables or characteristics (directly observable or latent) used to assign potential customers to homogeneous groups.

Moreover, in the last decades, great attention has been devoted to the measurement and analysis of Customer Satisfaction (CS) and Loyalty, operated by means of the Structural Equation Models (SEM) approach (Turk and Mutlu Yuksel, 2009). Later on, we shall make reference to applications to this context.

According to Wedel and Kamakura (1998) the predictive segmentation methods may be classified with reference to the following categories:

- A-priori
- Post-hoc (response based)

A-priori procedures are based on the availability of proper variables (demographics, psychographics, life style, perceptions, ...), which are assumed apt to make an appropriate segmentation.

Wedel and Kamakura (1998) classified clustering methods within the post-hoc procedures. We may observe that, however, Peter and Donnelly (2007) gave a slightly different definition and interpretation of the above classification criterion. The a-priori segmentation

approaches are those where the researcher has already decided the segmentation basis, in advance of doing any analysis on the available data concerning the specific problem under study, regardless the statistical technique employed. The segmentation basis consists of variables, when available, possibly different from those used in the subsequent analyses.

The post-hoc methods, also called data-driven or response-based procedures, classify statistical units on the basis of the research findings, thus performing the segmentation with reference to the same data set concerning the specific problem under study.

Examples of response-based procedures are represented by the following ones, based on the Partial Least Squares (PLS) algorithm: Finite Mixture Partial Least Squares (FIMIX-PLS), Partial Least Squares Typological Path Modeling (PLS-TPM) and REsponse Based Units Segmentation Partial Least Squares (REBUS-PLS), described by Esposito Vinzi *et al.* (2007), where their performances are also compared by means of a simulation study. All these procedures take into consideration the manifest variables, as well as the latent ones, whose scores are previously generated by adapting a common SEM to the whole sample of data. Moreover, in particular, FIMIX-PLS assumes that observations come from a finite mixture of normal populations (Hahn *et al.*, 2002), while the other procedures adopt proper measures of distance from units to the local models.

A post-hoc latent segmentation procedure is also presented by Boari and Cantaluppi (2007), which employs the estimated scores of the latent variables in order to perform a hierarchical cluster analysis of the respondent units. An aspect common to the four previously

mentioned procedures is that they all start from the estimation of a global path model; then, afterwards, they tackle the problem of detecting the unobserved heterogeneity and defining the cluster of data. We want also to outline that heterogeneity is ascribable essentially to the difference existing among the covariance structures of the observable variables from group to group (and therefore different inner relationships in the local models) and/or to the different mean levels of the latent variables.

The study covers the following topics: it introduces a proposal of an a-priori segmentation method based on the Customer Disposition toward Satisfaction (CDS) construct; the main reason for using the CDS scale stems from its attitude (Grace, 2005) to define clusters of statistical units, which may be assumed homogeneous with regard to the propensity to be “in general” satisfied by the products and/or services the subjects experienced (Anwar and Zafar, 2003). The formulation of the Italian version of the CDS scale is then proposed, to best adapt the original construct to the Italian social environment; the procedure started with a preliminary analysis of the translation of the items, within a pilot survey and its refinement and purification through a reliability analysis of the scale. Finally it is presented an application of that purified scale to the analysis of a wider survey, related to the Customer Satisfaction measurement of the Italian bank services and to the study of the relationship between CDS and CS.

THE CDS-BASED A-PRIORI SEGMENTATION APPROACH

An a-priori segmentation is typically performed by assuming that heterogeneous subjects can be assigned to segments on the basis of proper variables (directly observable or latent) like, for example, demographical and psychographic ones, or much better, variables pertaining Personality, Perceptions or Intentions, characterizing the respondents. Therefore, a-priori means that segmentation is performed prior to the definition of the models and of the variables that will be used for measuring the Customer Satisfaction and the Loyalty.

With reference to the study of the consumer behaviour, it was recently reported by Grace (2005) that CS may be related to the so-called notion of Consumer Disposition toward Satisfaction. The result may be also adopted, to our advice, to perform an a-priori segmentation of the statistical units before fitting proper structural equation models to the realized groups, in order to better assess their possible different behaviour.

The author derived the following five-item scale, properly purified and validated, to measure the CDS construct:

- G1:** Usually I am pleased with what I buy
- G2:** More often than not, I am a satisfied consumer
- G3:** I generally find the goods and services I buy don't live up my expectations (*)
- G4:** Quite often I am dissatisfied with my purchases of goods and services (*)
- G5:** Overall, I am usually satisfied with the purchases I make

where (*) indicates reverse scoring.

The statistical units belonging to the groups defined by the CDS-based a-priori segmentation can be described as follows: people with low CDS levels are likely to present high expectations pertaining the service under evaluation and low propensity to be satisfied; on the contrary people with high CDS levels are expected to present high satisfaction levels.

Nevertheless, we may observe that the CDS construct does represent a more general measure of customer attitudes or predisposition, since it is not definitely referred to the specific context, i.e. the bank service evaluation where CS is a key indicator. For this reason it should not be completely interpreted as the expectation of satisfaction, following the approach considered by Parasuraman *et al.* (1991) which requests the respondents to evaluate, according to the disconfirmation paradigm, both expectations and perceptions concerning only the specific service/product under assessment.

ADAPTATION OF CDS TO THE ITALIAN COUNTRY

A specific pilot Computer-Assisted Telephone Interview (CATI) was performed by a bank organization, in order to verify the adequateness of the previous defined scale to the Italian reality (Boari *et al.*, 2008), preliminary to the annual Customer Satisfaction survey, administered by the same institute for evaluating the opinion of the Italian population with respect to the financial services.

The following translation into Italian of the items G1, ..., G5, was administered:

- G1:** Normalmente sono contento di ciò che acquisto, (Usually I am pleased with what I buy)
- G2:** Sono un consumatore più spesso soddisfatto che insoddisfatto, (More often than not, I am a satisfied consumer)
- G3:** Generalmente trovo che i prodotti/servizi che acquisto non sono all'altezza delle mie aspettative, (I generally find the goods and services I buy don't live up my expectations)

Table 1: Reliability analysis of the CDS items in the pilot survey

Scale statistics				
	Mean	Variance	Std dev	No. of variables
	32.7846	42.7341	6.5371	5
Item-total statistics				
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
G1	25.5385	30.2212	0.4212	0.4203
G2	26.2923	28.9288	0.3515	0.4502
G3R	27.2308	32.1490	0.1413	0.5930
G4R	26.4154	32.0591	0.2230	0.5292
G5	25.6615	29.1962	0.4429	0.4032

N of cases = 65.0 N of items = 5 Alpha = 0.5377

Scale statistics				
	Mean	Variance	Std dev	No. of variables
	27.2308	32.1490	5.6700	4
Item-total statistics				
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
G1	19.9846	18.4529	0.6110	0.3462
G2	20.7385	17.9149	0.4688	0.4400
G4R	20.8615	28.0274	-0.0378	0.8132
G5	20.1077	17.7538	0.6189	0.3284

N of cases = 65.0 N of items = 4 Alpha = 0.5930

Scale statistics				
	Mean	Variance	Std dev	No. of variables
	20.7273	28.7860	5.3653	3
Item-total statistics				
	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Alpha if item deleted
G1	13.5758	13.3557	0.7510	0.5598
G2	14.3182	13.2049	0.5838	0.7519
G5	13.5606	16.0347	0.5400	0.7826

N of cases = 66.0 N of items = 3 Alpha = 0.7804

G4: Rimango abbastanza spesso deluso dagli acquisti che faccio, (Quite often I am dissatisfied with my purchases of goods and services)

G5: Nel complesso, di solito, sono soddisfatto degli acquisti che faccio, (Overall, I am usually satisfied with the purchases I make)

The items were gathered on a ten points Likert scale of measurement, according to the same general structure used for the items of the whole Customer Satisfaction questionnaire.

During the pilot survey a sample of 68 randomly chosen customers were contacted; 3 of them did not answer to all the 5 questions they were administered.

During the scale refinement and purification activities it was observed that the data collection procedure gave rise to some problems concerning the correct interpretation of the reverse scoring items, G3 and G4, essentially due to the telephone interview modality. This is confirmed by the reliability analysis (Cronbach's Alpha) reported in Table 1: the items G3 and G4 (in their reverse form) do not contribute to the existence and

validity of the CDS construct. Observe that 66 customers gave complete response to all the items G1, G2 and G5.

The following Italian translation of the CDS scale, which takes into account only the items G1, G2 and G5, has been consequently proposed:

CDS1: Normalmente sono contento di ciò che acquisto, (Usually I am pleased with what I buy)

CDS2: Sono un consumatore più spesso soddisfatto che insoddisfatto, (More often than not, I am a satisfied consumer)

CDS3: Nel complesso, di solito, sono soddisfatto degli acquisti che faccio, (Overall, I am usually satisfied with the purchases I make)

where, CDS1, CDS2 are the translations of the original items G1, G2 proposed by Grace (2005), while CDS3 corresponds to the item G5 that is quite similar to reverse of item G3.

The estimated scores of the latent variable (factor) CDS, linked to the three previous items, may then be used to define the preliminary grouping of the respondents.

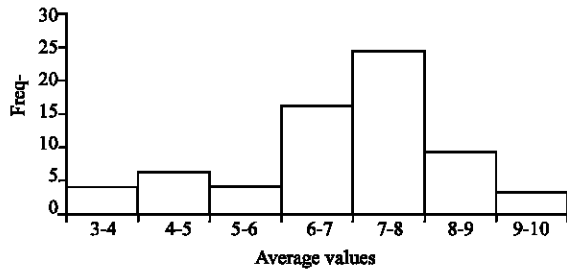


Fig. 1: Distribution of the average values for the items defining the CDS scale in the pilot survey

Table 2: Sample distribution of the response

Level	CDS average values
Low	15 (22.06%)
High	53 (77.94%)

For the sake of simplicity we considered the average values of the items defining the CDS scale. They are represented in the histogram in Fig. 1, which gives evidence of the presence of two distinct groups: customers disposed toward satisfaction (the majority) and those who are not particularly disposed (left tail of the graph).

In order to optimally define the two groups, the ratio, D_B/D_w , of the deviance between groups, D_B and the deviance within groups, D_w , was calculated by separating the respondents in the two groups defined at the subsequently ordered estimated averages. The point 5.67, attaining the maximum ratio 2.33, can be defined as the ideal cut-off value, giving a significant F-statistic value of 153.78 ($p < 0.001$).

Table 2 reports the sample distribution of the responses. Observe that people not particularly disposed toward satisfaction do not represent a negligible minority: this type of customer could be expected to give also negative evaluations concerning satisfaction and loyalty.

We remark that the aim of the annual above mentioned survey is to describe the relationships among Customer Satisfaction, Loyalty, their antecedents and all the corresponding observable proxy variables (inner and outer models). With reference to the clusters defined by the CDS scores, path models of the identical structure will be locally adapted. Usually, their structure may be tentatively identified by making recourse to the whole sample.

It may be observed that the responses given to the CDS items during the pilot sample were influenced, in a certain amount, by the fact that the subjects were requested to answer to all the 5 items; thus, the 3 items considered in the final prospect of Table 1 concern only 3 of the 5 aspects the respondents thought over. As we shall see, some different conclusions, with regard to the

problem of establishing the grouping of the respondents, have ensued when the results were analysed by a larger sample, which is expected to be more representative: in that case respondents were administered a somewhat different construct based on 3 items only.

FINAL SURVEY DATA ANALYSIS

A more in depth analysis was performed with reference to the 2008 CS survey, whose questionnaire was completed by including the preceding three CDS items. A sample of $n = 1905$ valid interviews was considered in order to analyse the whole Italian population sentiment with respect to the country banking system.

Figure 2 shows the distribution of the mean values of the scores for the 3 items defining the CDS scale: the segmentation of units comes out less clearly when compared with the pilot survey. Figure 3 shows, with reference to both the pilot and final surveys, the behaviour of the ratios D_B/D_w calculated by separating the respondents in the two groups defined at the subsequently ordered estimated averages, which gives evidence that a partition of the units, according to the cut-off of the estimated averages, is less feasible for this new survey.

We recall that here the respondents were asked to answer only to the 3 items, pertaining the measure of disposition to be satisfied and consequently they focused their attention only on these 3 aspects of the general concept; we remind that in the pilot survey they thought over the 5 questions (before purification). For these reasons we decided to try a segmentation by performing a cluster analysis on the basis of the 3 CDS variables. Observe that, in our advice, this method of segmentation can be defined an a-priori classification, in the sense that it is based upon variables which are different from those that will be of concern in the subsequent analysis (e.g., structural relationships among the key latent indicators in the customer satisfaction model for the bank services).

By adopting the Euclidean distance and the Ward clustering method 4 groups were defined, as summarized in Table 3.

The clusters are labelled by following the ascending order of the CDS variable levels.

Observe that group 1, which pertains to people not particularly inclined to satisfaction, represents only 10% of the units. Furthermore, we may outline that the mean level of the item CDS2 (Sono un consumatore più spesso soddissfatto che insoddissfatto/More often than not, I am a satisfied consumer) is the lowest among the ones within group 2, referred to the other items and the CDS average. The same does not occur in the other clusters.

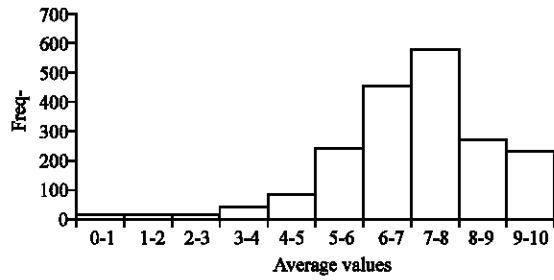


Fig. 2: Distribution of the average values for the items defining the CDS scale in the final survey

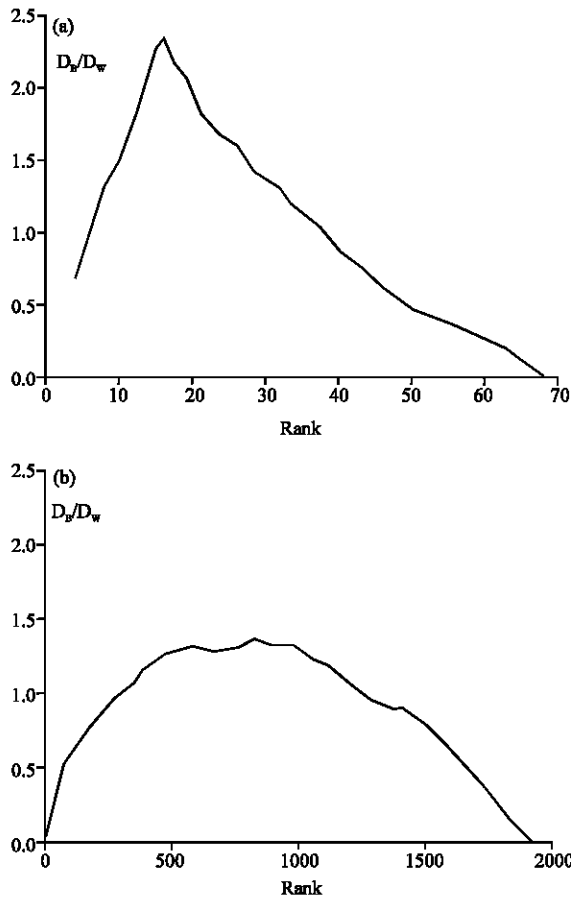


Fig. 3: Ratio D_B/D_w evaluated considering each respondent average as a cut-off point in the pilot survey (a) and the final survey (b)

Table 4 shows the marginal distributions of the summated values of the variables describing the scales of CDS and overall CS for the two 4-cluster solutions obtained by considering respectively the CDS and the overall CS variables.

Table 5 presents the frequency distribution for the cross tabulation of the classifications assigned to the units with reference to CDS and overall CS.

Table 3: Summary statistics for the CDS variables among the four defined clusters

Cluster n°	1	2	3	4
n	191	334	976	404
%	10.0%	17.5%	51.2%	21.2%
CDS1	4.31	6.45	7.64	9.58
CDS2	4.33	5.77	7.68	9.29
CDS3	4.02	6.25	7.35	9.11
CDS average	4.22	6.16	7.56	9.33
S.E.	1.34	0.46	0.59	0.58
(S.E. of estimate)	(0.097)	(0.025)	(0.019)	(0.029)

Table 4: Summated scores of the indicators measuring CDS and overall CS variables by the two respective 4-cluster solutions

CDS	1	2	3	4	Overall CS	1	2	3	4
3	10				3	12			
4	3				4	5			
5	2				5	5			
6	9				6	3			
7	5				7	4			
8	4				8	6			
9	4				9	3			
10	7				10	11			
11	11				11	17			
12	15				12	17			
13	17				13	21			
14	20				14	26			
15	39	3			15	41	5		
16	17	31			16	19	17		
17	25	28	1		17	1	48		
18	2	124	5		18		105		
19	1	63	25		19		98	1	
20		66	47		20		128	1	
21		16	228		21		156	14	
22		3	146		22		97	71	
23			145		23			167	
24			279	2	24			239	
25			53	33	25			103	
26			30	55	26			106	21
27			11	89	27			20	75
28			6	64	28				89
29				20	29				37
30				141	30				116

Somers-D and Kendall's Tau-b concordance tests give significant results, though the CDS and overall CS groupings do not match exactly.

The attitude of people with lower CDS levels to present in general higher expectations and thus lower satisfaction levels pertaining also the service under evaluation is fairly confirmed.

In particular, following Cronin and Taylor (1994), the evaluation of the perceptions should also include the evaluation of the expectations and thus satisfaction could be measured directly by considering only the evaluations expressed for the perceptions of the service performance. This is outlined by the fact that people more delighted than expected, in the lower left section of the table (21+71+7+17=116), represent only 6% of the respondents. Bold figures represent all the concordant assessments between disposition and satisfaction. The presence of 328 cases (17%) in the upper right section of Table 5 might be interpreted as a possible drawback.

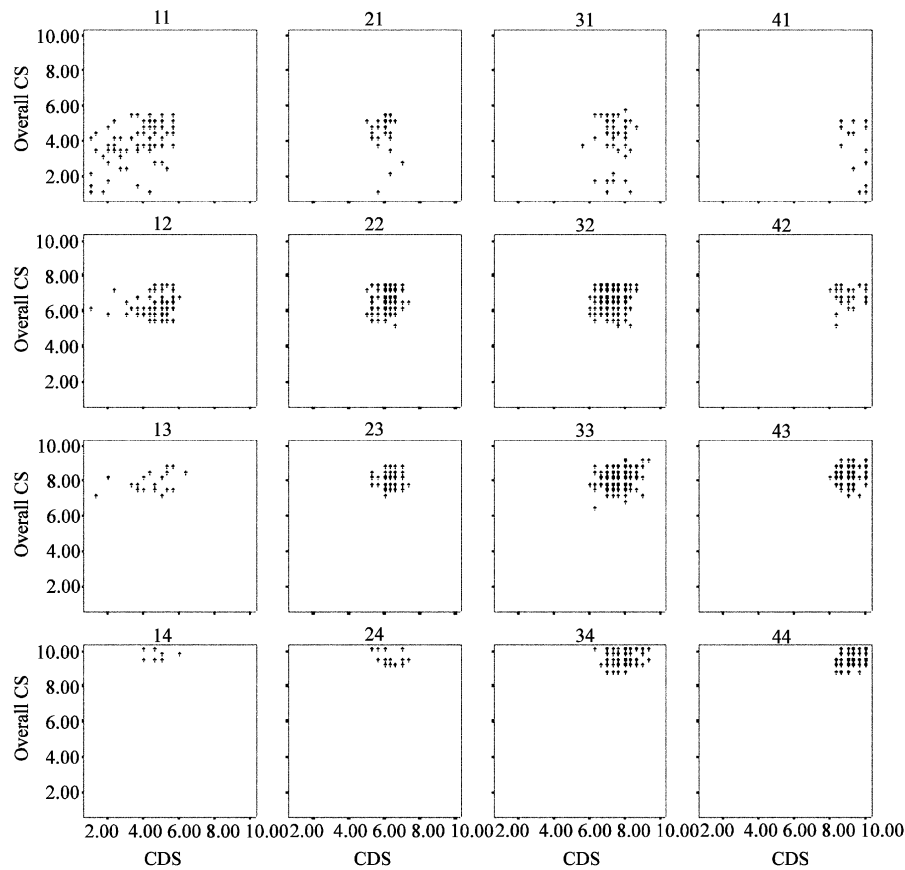


Fig. 4: Scatter plot diagrams of CDS mean vs overall CS mean for the 16 groups defined in Table 5

Table 5: Cross tabulation of cluster assignments for CDS and overall CS

Overall CS	CDS				
	1	2	3	4	
1	76	37	59	19	191
2	87	209	328	30	654
3	21	71	466	164	722
4	7	17	123	191	338
	191	334	976	404	1905

Table 6: Box test of homogeneity of covariance structures by group

Box M	F	df 1	df 2	Sig.
5154.029	2.392	1998	724065.296	0.000

However, if we examine Fig. 4, which contains the scatter plot diagrams (CDS mean vs overall CS mean) for the 16 pairs obtained by combining the clusters for CDS and overall CS, also identified by the cross tabulation represented in Table 5, the group of 328 statistical units belonging to cluster 3 for CDS and to cluster 2 for overall CS (cross tabulation labelled 32) is characterized by a quite high level for both variables. So these 328 cases can be considered to give a concordant assessment between disposition and satisfaction too.

The respondents belonging to the groups defined by the cross tabulations labelled 31, 41 and 42 (108 units,

5.7% of the sample) have the highest level for CDS and a middle-low level for overall CS; so they represent problematic customers for the financial services, since they assign to the Italian banking service an overall CS evaluation lower than one could expect according to their high disposition to be satisfied.

A further evaluation of a correct identification of the latent groups, by means of the cluster analysis performed on the CDS variables, may also be done by testing the following hypotheses:

- Homogeneity, among clusters, of the covariance matrices of the manifest variables defining the measurement model
- Equality of the mean levels of the latent variables concerning CS and Loyalty

To verify the first hypothesis the so-called Box's M test may be used, while the latter hypothesis should require the execution of a MANOVA test on the latent variable scores that will be estimated by means of the local models.

Observe that the former hypothesis directly concerns the model heterogeneity that gives rise to different linear

effects among the latent variables defining the inner model, while the latter one takes into account the differences among the average levels of the latent scores characterizing the groups.

Table 6 shows, according to the Box's M test, that the hypothesis of the homogeneity of the units should be rejected.

Since path coefficients are related to the data covariance structure, we can say that the structural models pertaining the 4 different segments will not have the same inner relationships. With reference to a common structural relationship scheme, local structural equation models, with possible different parameter estimates, should then be adapted across the groups.

FINAL COMMENTS

A preliminary remark of the definitions of a-priori and post-hoc segmentation criteria, Peter and Donnelly (2007), was made. Then we proposed a segmentation procedure based on clustering the statistical units with reference to the a-priori information given by the Customer Disposition of Satisfaction (CDS) scores.

The CDS scale (Grace, 2005), describes a general attitude of the customers to be satisfied with purchased products or experienced services and considers variables not involved in the subsequent customer satisfaction analysis.

An interpretation is also given, with regard to the relationship between this "general" propensity to be satisfied and the measures of satisfaction related to a specific product or service considered, for example, in the SERVQUAL and SERVPERF models, Parasuraman *et al.* (1991) and Cronin and Taylor (1994).

An Italian translation of the corresponding item scale was suggested and tested by a pilot survey. The practical evidence showed that, due perhaps to the CATI interview procedure, reverse items do not work properly; so the proposed Italian version of CDS was reduced to only 3 items.

The CDS-based a-priori segmentation seems to be a good criterion also to identify problematic situations (e.g. the pre-analysis of the churn behaviour, to identify customers possible discontinuing to use a particular service).

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