MTISD 2008 – Methods, Models and Information Technologies for Decision Support Systems
Università del Salento, Lecce, 18-20 September 2008

Preferences of others and false consensus effect

Massimo Squillante and Viviana Ventre
Department of Economical and Social Systems
University of Sannio, Benevento (Italy)
squillan@unisannio.it; ventre@unisannio.it

Abstract: *A Multi Expert Multi Criteria Decision Making problem is considered, in which a consensus model is guided by both consensus and false consensus effects. The consensus reaching process is guided automatically and it is modelled within OWA operators. Our study contributes by investigating the impact of the description of the choice option and the form of the judgement task on the magnitude of the agreement in the case of presence of the false consensus effect.*

Keywords: consensus reaching process, false consensus effect, OWA operators, ME-MCDM.

1. False Consensus Effect

The need to predict the preferences of others arises in numerous marketing contexts. Consumers frequently need to predict the preference of others and marketers routinely judge what product offerings may be more or less attractive to potential buyers. The idea that people project onto others their own beliefs, attitudes, and predispositions has a long history [5], [6], [7].
The issue of projecting from the self to predict others' preferences has been investigated in social psychology and one robust findings is that people with a certain preference tend to make higher judgements of the popularity of that preference in others, compared to the judgements of those with different preferences. This empirical result has been termed the "false consensus" effect [7]. This effect is characterized by a tendency to overestimate the extent to which other people share one's beliefs, attitudes and behaviours [3].

In social perception and attribution, people tend to assume that their own responses are more common than they really are and to consider alternative responses as uncommon, deviant or inappropriate [8].
Curiously, there has been no research on one of most intriguing explanations of the false consensus effect: an explanation that is focused on the resolution of ambiguities inherent in most choice problems.

2. Evaluations for consensus and aggregation operators

A difficulty that has to be addressed when dealing with real Multi Expert Multi Criteria Decision problems is the presence of the false consensus effect because it can lead to an absence of objectivity in the evaluation process.
Let us assume the decision theoretical paradigm in [2]. Therefore it seems appropriate, in an evaluation formulated by the expert, to distinguish the contribution to the decision due to technical and political judgements from the one determined by false consensus effect. It results that the opinion of each expert is decomposed into two components: a vector, made of the ranking of the alternatives, built by means of a "classical" procedure, e. g. a hierarchical procedure, and a fuzzy component that represents the contribution of the false consensus effect, that we assume to be fuzzy in nature. This allows us to consider in the sequel aggregation operators, such as OWA operators.
The formal model considers the set N of decision makers, the set A of the alternatives and the set C of the criteria. Our starting point here is a method inspired by [2] and developed by [4].
Let any decision maker $i \in N$ be able to assess the relevance of each criterion. Precisely, for every i, a function

h_i: C→[0, 1],

with $\sum_{c \in C} h_i(c) = 1$, denoting the evaluation or weight that the decision maker assigns to the criterion c, is defined.

Furthermore the function g_i: A×C→[0, 1] is defined, such that $g_i(a, c)$ is the value of the alternative a with respect to the criterion c, in the perspective of i. The values $h_i(c)$ and $g_i(a, c)$ can be determined by suitable procedures [1].

Let n, p, m, denote the (positive integer) numbers of the elements of the sets N, C and A, respectively. The value $h_i(c)_{c \in C}$ denotes the evaluation of the p-tuple of the criteria by the decision maker i and the value $g_i(c,a))_{c \in C, a \in A}$ denotes the matrix $p \times m$ whose elements are the evaluations, made by i, of the alternatives with respect to each criterion in C. Function f: A→[0, 1], defined by

$$(f_i(a))_{a \in A} = (h_i(c)_{c \in C}) \bullet (g_i(c, a))_{c \in C, a \in A} \quad (1)$$

is the evaluation, made by i , of the alternative $a \in$A.

A euclidean metrics, that acts between couples of decision makers i and j, i. e., between individual rankings of alternatives, is defined by

$$d(f_i, f_j) = \sqrt{\frac{1}{|A|} \sum_{a \in A} (f_i(a) - f_j(a))^2} \quad (2)$$

If the functions h_i, g_i range in [0, 1], then also $0 \leq d(f_i, f_j) \leq 1$. Hence the set of all decision makers is represented by a set of points of the unit cube in a euclidean space.

If we set $d^* = \max\{d(f_i, f_j) | i, j \in N\}$, then a degree of consensus δ^* can be defined as the complement to one of the maximum distance between two positions of the experts:

$$\delta^{(+)} = 1 - d^{(+)} = 1 - \max\{d(f_i, f_j) \mid i, j \in N\}.$$

We assume that the evaluation $f_i(a)$ of the alternative a to the decision maker i, may be split into two components:

$$f_i(a) = k_i(a)K + h_i(a)H \quad (3)$$

This polynomial representation of a synthesis of a judgement stands for a numeric component $k_i(a)$K that maintains all the available quantitative information and another addend $h_i(a)$H, whose coefficient $h_i(a)$ reflects subjectivity, including our ability to infer information according to the false consensus effect.

We can measure the level of consensus by means of the consensus function $\delta^{(+)}$ and we can define also a *dissent function* $\delta^{(-)}$ as the complement to 1 of the consensus function.

Yager [9] introduced an aggregation technique based on the concept of ordered weighted averaging (OWA) operators.

Let $w = (w_1, w_2, ..., w_n)$, $w_i \in [0,1]$ and $\sum_i w_i = 1$ in R^n and f a mapping $f : R^n \to R$ defined by $f(a) = f(a_1, a_2, ..., a_n) = \sum_j w_j b_j$, where b_j is the j-th largest of the a_i's.

In other words the vector $b = (b_1, b_2, ..., b_n)$ has components that are the decreasing rearrangement of the components of a.

The function f is called on OWA operator (of dimension n) and the vector w a weight vector. Given a weight vector w, on OWA operator f defines a procedure of aggregation. A fundamental aspect of this operator is the re-ordering step of aggregates.

Bibliography

[1] Bana e Costa, C.A., Vansnick, J.C., 1999, *The MACBET approach: basic ideas, software and an application*, In: N. Meskens, M. Roubens (eds), Advances in Decision Analysis. Kluwer Academic Publishers, Dordrecht, 131-157.

[2] Carlsson, C., Ehrendberg, P., Eklund, P., Fedrizzi, M., Gustafsson, P., Lindholm, G., Merkuryeva, G., Riissanen, T. and Ventre, A.G.S., 1992, *Consensus in distributed soft environments*, European Journal of Operational Research, vol.61, 165-185.

[3] Dawes, R.M. and Mulford, M., 1996, *The false consensus effect and overconfidence: Flaws in judgment, or flaws in how we study judgment?* Organizational Behavior and Human Decision Processes 65: 201—211.

[4] Eklund, P., Rusinowska, A. and De Swart, H., 2007, *Consensus reaching in committees*, European Journal of Operational Research 178, 185-193.

[5] Freud, S., 1956, *Further remarks on the defense neuropsychoses*. Collected papers of Sigmund Freud (vol.1). London: Hogarth Press.

[6] Mullen, B., Atkins J. L., Champion, D.S. Edwards, C., Hardy, D., Story, J.E. and Vanderklok, M., 1985, *The false consensus effect: A meta-analysis of 115 hypothesis test*. Journal of Experimental Social Psychology, 21, 262-283.

[7] Ross, L., Greene, D. and House, P., 1977, *The "False Consensus Effect": An Egocentric Bias in social Perception and Attribution Processes*. Journal of Experimental Social Psychology, 13, 3, 279-301, May 77.

[8] Tversky, A. and Kahneman, D., 1974, *Judgement under uncertainty: Heuristics and biases*. Science, 185, 1124-1130.

[9] Yager, R.R., 1988, *On ordered weighted averaging aggregation operators in multi criteria decision making*. IEEE Trans. Systems, Man, Cybernetics, 18(1): 183-190.