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Persuasion with deceit elicits the "Trojan Horse Effect" in tennis players

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KEYWORDS	ABSTRACT
heuristics, persuasion, deceit, tennis players, Trojan horse effect	*When people decide and solve problems without complete information, often use heuristics, leading to cognitive biases. To 90 both sexes tennis players, subdivided into three levels of performance, was requested to test two identical rackets having two similar strings, apart for the brand and the price, presented to half of the sample with reversed details about their nature. The deceived players evaluated the strings in accordance to the suggestions offered, with an inverted proportion between the evaluation gradient and the level of performance. The higher the performance level, the higher was the factual evaluation. The non-influenced group judged the strings in accordance to its own sensitivity and didn't reached the other group results. Persuasion with deceit generates an effect temporarily defined as: the "Trojan Horse Effect". Further research is needed to verify if performance can be increased by using training methodologies eliciting this effect.*

Introduction

Lot of specific cognitive heuristics are at work daily to confirm that our beliefs are true (Kahnemann et al., 1982). They are mental methods of problem solving that through intuition and trial and error, permit us to solve problems even when no formal means to extricate them are available (Shermer, 2011). In recent decades a high number of biases have been recognized, one of the most important is the confirmation bias, that pushes us to look for and find confirmatory evidence in favour of already existing beliefs and pay no attention to or to understand disconfirming evidence anew (Darley & Gross, 1983; Kuhn, 1989). Persuasion occurs every time that a person or a group (a recipient or an audience), undergo to an intervention (through persuasive communication) carried out by a source (another individual or group), and this in a peculiar setting (the context). Deceit requires to cause someone to accept as valid or true what is invalid or false. The action of deceiving appears to be very old, for some authors it started in Primates from 90 to 35 million years ago, with a greater ability to learn and use social attitudes and increased brain size (Byrne & Whiten, 1992). As the beliefs of humans are dependent on a high number of subjective, affective, personal, emotional, and psychological factors influencing our understanding of reality, the aim of this study was to check the influence of persuasion with deceit in subjects possessing different ability levels. Professional tennis players were chosen because in Italy four categories describing the level of performance have been established. Each of them accurately delineates the background and the achievements of the single professional. The rationale of the study was that the higher the level of performance, the lower should have been the influence of deception. Some studies (Witt & Proffitt, 2005; Witt et al., 2008) on perception and performance, found in softball players and in golfers, that the athletes' ability to act influences both.

Materials & methods

To test this hypothesis, 90 both sexes North-Italian agonist tennis players were chosen among the four main agonistic categories: the first, or the «top» level, was excluded for recruitment problems. Athletes were subdivided into two groups and then asked to test two twin rackets that differed for the strings only, whose main dissimilarity was the brand (and the cost). Persuasion with deceit occurred because the two strings were presented to a first group (SI, or strongly influenced, 29 males and 16 females, aged 30.24±11.8; min=18, max=61). To them two documents were shown (one for each string), then they underwent to test. The documents were explanatory leaflets emphasizing reversed characteristics about the nature and characteristics of the strings: the costly one (HC) was said to be mediocre, and useful for beginners. The cheaper string (LC) was proposed as being a revolutionary product, newly branded and successful because it was produced by a leading company. Participants were required to test the two strings dribbling for 10 minutes (from backcourt and with a same-level setter). At the end of their involvement they were requested to quantify, in a 5-items Likert-type scale (from excellent to «shoddy»), their perception of quality regarding the strings. Then they had to report whether they would like to use the strings in official competitions or not. A second group (NI, or non-influenced, 26 males and 19 females, aged 30.38±11.9; min=18, max=61) followed the same treatment, apart the pre-conceived judgement on the strings: their intuition was the only variable influencing their opinion. The tension of the strings was fixed in 22 Kg., a realistic middle ground between push and control, utilized as standard measure by many athletes. To make the tennis player hard to trace the brand of the ropes used, the identification references of the products used were deliberately deleted. To ensure that, during time, the feelings would have been as similar as possible, the strings were replaced after each trial day, so that they did not suffer from heat and excessive wear. To prevent the tennis players sway over colleagues, they were warmly recommended not to disclose to their peers the test to which they were subjected to.

Results

Regarding the LC string, in the SI sub-group an inverse relationship was found between the average evaluations of the athletes and the performance level obtained. This did not happen in the NI sub-group, as shown in table 1.

Group	N. of subjects	X	SD
SI 2	15	3.53	0.52
SI 3	15	4.07	0.59
SI 4	15	4.47	0.52
SI Total	45	4.02	0.66
NS 1	15	1.80	0.56
NS 2	15	2.13	0.52
NS 3	15	2.07	0.70
NS Total	45	2.00	0.60
Total (SI+NI) 2	30	2.67	1.03
Total (SI+NI) 3	30	3.10	1.13
Total (SI+NI) 4	30	3.27	1.36
Total	90	3.01	1.20

Table 1 - Results obtained for the LC string.

ANOVA 2 (sub-groups) x 3 (category or level of performance) applied on the average evaluations, showed a group [F_2 =281.39, P <.01] and a category effect [F_2 =8.80, P <.01], but no interaction group/category. Category comparisons showed significant differences between the second and the third category (p<.05), but not between the third and the fourth. Even in the HC string the inverse relationship was found, and both in the SI and NI sub-groups. ANOVA 2 (groups) x 3 (categories) highlighted a group effect [F_2 =330.99, P <.01], a category effect [F_2 =6.84, P <.01], with interaction [F_2=3.79, P <.05]. The category effect emerged with comparisons only for SI, but it was significantly different only for the categories 2 and 4. The NI sub-group did not show category differences. In the SI sub-group, the difference from the average of the evaluations offered by the fourth category athletes, resulted significantly lower than the other categories (P <.01). Table 2 reports the results.

Group	N. of subjects	X	SD
SI 2	15	2.33	0.49
SI 3	15	2.07	0.26
SI 4	15	1.47	0.52
SI Total	45	1.96	0.56
NS 1	15	4.07	0.70
NS 2	15	4.00	0.38
NS 3	15	3.93	0.70
NS Total	45	4.00	0.60
Total (SI+NI) 2	30	3.20	1.06
Total (SI+NI) 3	30	3.03	1.03
Total (SI+NI) 4	30	2.70	1.39
Total	90	2.98	1.18

Table 2 – Results obtained for the HC string.

When subjects were asked to express a dichotomic judgement about their interest to use the rackets in a competition, differences emerged at the χ^2 test for the LC string, both for categories and groups. Data, in fact, show that significant differences existed in every category between SI and NI, even with different proportions between those who will use/don't use the LC string in a race. The second category showed inner significant differences (χ^2_1 = 7.03. P <.01), but no so high as in the other categories (χ^2_1=16.43, P <.01).

Level & group	Affirmative	Affirmative	Negative	Negative
	LP string	HP string	LP string	HP string
2 SI	9 (60%)	2 (13.3%)	6 (40%)	13 (86.7%)
2 NI	2 (13.3%)	9 (60%)	13 (86.7%)	6 (40%)
3 SI	14 (93.3%)	0 (0%)	1 (6.7%)	15 (100%)
3 NI	3 (20%)	13 (86.7%)	12 (80%)	2 (13.3%)
4 SI	14 (93.3%)	0 (0%)	1 (6.7%)	15 (100%)
4 NI	3 (20%)	12 (80%)	12 (80%)	3 (20%)

Table 3 – Percentages found in the two sub-groups regarding the possible use of the rackets in competition.

Similar results were found for the HC string, even if in this case suggestion show its effects in the second category as well (χ^2_1=7.03, P <.01). A logistic regression was carried out for both the strings, using as dependent variable the dichotomic response and, as predictors, the perceived quality, the category and the group per quality. Only for the LC string the quality effect emerged, that does not change for category and group (P <.05). Practically, the higher the perceived quality, the higher was the possibility that the athletes decided to use the string in a race. Significant differences did not emerge for the HC string.

Discussion & conclusions

Our findings show that the starting hypothesis is confirmed. For the LC string, the average evaluations of the SI athletes substantiate that persuasion had a great impact. Then the influence was inversely proportional to the athletes' level of performance. This did not happen in the NI group, as the evaluation expressed on the basis of the performance level did not follow the same gradient of the previous sub-group, as they showed an internal variability connected to their subjective sensitivity. Then persuasion generated effects also in the dichotomic choice to bring the rackets in a race, as many of the SI subjects, in all the levels of performance, decided to eventually use them in a competition, even if inner differences inside the categories emerged, however hierarchically respecting the levels. Logistic regression confirmed the trend, as with the increase of the perceived quality, the higher was the possibility that the tennis players decided to avail themselves of such a product in official competitions. The results on the LC string are interesting, as persuasion with deceit elicited upshots in the totality of the SI athletes, as the effects obtained went beyond the level differences among categories. This demonstrated the power of the modality used in changing the evaluation horizons of the subjects involved. Regarding the HC string, an analogy exists with the LC, as even in this case, the persuasive impact was found with inversed proportion according to the level of performance. A range existed between the evaluations expressed by the SI and the NI athletes, further confirming the starting hypothesis. This was also found regarding the desire to use the string during a race, as persuasion showed its effect, maintaining, even in this case, inversed proportions with respect to the performance level.

The deceptive persuasion was furnished to our athletes thanks to the total and paradoxical alteration of the characteristics of the strings used: captivating for the LC and discouraging for HC, and its psychological effects were difficult to be thoroughly defined. It was a sort of priming, as we semantically exposed the athletes to a stimulus that influenced the response to another series of stimuli (Meyer & Schvaneveldt, 1991). Then, some cognitive heuristics were elicited, such as the confirmation (Nickerson, 98), the anchoring biases (Tversky & Kahnemann, 1981) and the framing effect (Levin et al., 2002; Fan, 2017). The most powerful of them was for sure the confirmation bias, because of the resemblance of our test to that designed and reported in 1983 by Darley & Gross. None of the above-mentioned heuristics, however, completely clarified the onset of the effects that emerged. For which, provisionally, we could define the found effects, with a single syntagm: the Trojan horse effect (THE). In effect, in medicine THE is a disastrous result of an anticipated gain, as it happens, for example, with the HIV infection. In veterinary medicine it occurs with the Streptococcus in fishes (Zlotkin et al., 2003). In computing the term indicates a malicious computer program able to mislead users of its true intent. At this point, without prejudice to the necessary checks, it may be of interest to evaluate the applicability of this effect. That could become a strategy useful in training. In swimming and motorcycling expedients are used to spur to athletes to overlay their limits: Altered information is furnished on their race times. In a similar way, it would be possible to induce in the athletes a Pygmalion effect in agreement with the self-fulfilling prophecy (Merton, 1968). That on the contrary

could lead, however, to the self-defeating prophecy (Bushman *et al.*, 1999), if the restlessness of failure will prevail. Apart the moral and ethical problems that can rise with the use of deception, especially in young people (NYSCA, 2016; Huston, 2017; Dangi & Witt, 2017), deceit is not difficult to be used, as deception detection is a quite difficult and variegated task (Morris, 2014). Clearly, further research is necessary. It is essential to evaluate even if and how the performance is conditioned by persuasion with deceit. Then it would be interesting to imagine different experimental designs for other sporting activities using different sport equipment. And again, to check how performance will be affected. In conclusion, the THE observed among tennis players involves a certain number of heuristics and, if tested and verified in other areas and contexts, it could be included in the variegated panorama of the existing cognitive biases.

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