Machiavellian people's success results from monitoring their partners

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ABSTRACT

This study is aimed at exploring the decision making processes underlying the Machiavellians' exploitation of others in a social dilemma situation. Participants ($N = 150$) took part in a competitive version of public goods game (PGG), and filled out the Mach-IV and TCI test. Our results showed that high Mach people gained a higher amount of money by the end of the game, compared to low Machs. The regression analyses have revealed that Machiavellian persons were more sensitive to the signals of social context and took the behavior of their partners into consideration to a greater extent when making a decision than did non-Machiavellians. We discuss the Machiavellian players' success in terms of personality and situational factors, and suggest that Machiavellian people may have certain cognitive and social skills that enable them to properly adapt to the challenges of environmental circumstances.

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1. Introduction

Machiavellianism involves interpersonal strategies that advocate self-interest, deception and manipulation (Christie & Geis, 1970; Jones & Paulhus, 2009). It is characterized by relative independence from the opinion of the others and a strictly rational, utilitarian approach to social dilemmas (Fehr, Samsom, & Paulhus, 1992; McIlwain, 2003; Wilson, Near, & Miller, 1996).The scores on Mach scales are in negative correlation with the agreeableness and conscientiousness personality factors as well as with emotional intelligence (Andrew, Cooke, & Muncer, 2008; Austin, Farrelly, Black, & Moore, 2007).

On the basis of behavioral studies, several researchers have concluded that Machiavellians are more interested in short-term benefits than in long-term gains (Wilson et al., 1996). They seek instantaneous profit and their behavior is mostly governed by directly attainable reward, whereas they pay little attention to potential long-term costs (Christie & Geis, 1970; Gunnthorsdottir, McCabe, & Smith, 2002). However, according to recent studies, it is quite likely that Machiavellians may be successful even in the long run by misleading and abusing others. In one study, Machiavellians made the largest profit, which was due to the fact that they paid little money in the non-punishable phase and made good profit, while in the punishable phase they attempted to avoid punishment by raising their contribution (Spitzer, Fischbacher, Herrnberger, Grön, & Fehr, 2007). Machiavellians can successfully adapt to the requirements of a given situation, and change tactics when necessary (Jones & Paulhus, 2009).

Machiavellians are also adaptive in the sense that although they often violate norms, they follow norms when it serves their best interest or the situation requires this kind of manipulation. They often use the tool of misleading cooperation, especially in cases when cheating is too costly (e.g. the cheater is easy to identify) and cooperation yields a large benefit. In a recent "real-life" study, more than twice as many Machiavellians applied for voluntary charity work when their offers were made in the presence of their group members than when offers were made anonymously (Bereczkei, Birkas, & Kerekes, 2007, 2010). Other studies found that Machiavellians successfully deceived others to be able to acquire money, recognition and status (Sakalaki, Richardson, & Thepaut, 2007; Williams, Nathanson, & Paulhus, 2011). The effectiveness of the fraud they committed is shown by the fact that it is relatively difficult to expose them. They are good at lying and concealing their true intentions (Geis & Moon, 1981; Wilson et al., 1996).

These studies have demonstrated the tactical skills of Machiavellians that made them successful in various situations. However, they did not examine the important personality factors and situational variables like the composition of the group and the strategies used by the others. Therefore, they had a limitation in tracing the Machiavellians' decision-making processes and problem-solving mechanisms leading to exploit others.

In the present study, we analyzed the Machiavellian people's decisions step by step (round by round) in the course of a social dilemma game. Public goods game (PGG) is a standard method to examine group-level social dilemma (Ostrom, 1990). The conventional PGG is a mixed-motive setting in which people can choose between cooperation and competition. While it is usual, that some

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of the participants choose free-rider strategy (transfer no or little amount to the public account), most of the subjects play as a conditional cooperator, because thiss trategy can result in higher group-level benefit (Fischbacher, Gachter, & Fehr, 2001; Gintis, Bowles, Boyd, & Fehr, 2007). However, standard PGG (with no punishment) where the group members are expected to show more or less cooperative attitude, is not a really challenging situation for high Mach individuals: it is easy for them to exploit the cooperative group-mates. Therefore, for the present experiment, we modified the standard PGG, and developed a competitive version of it in which only one person received money by the end of the game (see Section 2).

Another reason why we chose this method was that several researchers found that high Mach individuals can gain remarkable success in a competitive social enviroment. Machiavellianism is a significant variable influencing career choice and success at the workplace (Christie & Geis, 1970; Wakefield, 2008). In competitve occupations and professions (e.g. management and law) the average Mach score of workers is higher than in cooperative and helping work-positions (Chonko, 1982; Corzine, 1997; Fehr et al., 1992; Zook & Sipps, 1987), furthermore HM individuals are more successful in a competitive work-environment. Therefore we used a competitive model-situation to investigate the reasons and motives underlying the HMs' efficiency.

This version of PGG made unambiguous for all of the players that low or no contribution to the public good is the most effective strategy. In this context Machiavellian people faced a more demanding situation because they had to win in a group where everybody was more or less competitive. Consequently, they were expected to recruit especially effective tactics for exploiting the others.

During the experimental game we not only observed the participants' contributions and payoffs, but also analyzed the effect of the partners' behavior on the individual decisions. In accordance with the finding of the other studies we first predict that Machiavellian players will transfer a smaller amount of money on each round and gain a higher amount at the end of the five-rounds game, compared to non-Machiavellians.

Why are they successful? We assume that the success of Machiavellians lies in the flexibility of their behavioral responses. They may permanently monitor their partners and make responses accordingly, which makes their exploiting behavior very efficient. More precisely, we predict that in decisions made during a social dilemma situation, Machiavellian persons take into account the previous steps of their partners to a greater extent than non-Machiavellians. They evaluate the decisions made by the others in the previous round and choose a strategy that is offering an amount of money lower than the expectable average contribution in the group, yielding the most benefit for them by the end of the game.

For this purpose, we used regression analyses to see what factors influence the moves of players in the Public Goods game. Our main question concerned the factors that influence the players' decisions: is their own strategy used in the game, or the behavior of the other members of the group that determine the amount they offer in each round?

In order to trace Machiavellians' decisions, we had to compare the behavioral outputs of Machiavellians and non-Machiavellians. Therefore, we selected people with high scores on the Mach-test of the total sample and regarded them as Machiavellian people. In this classification we followed Christie and Geis (1970) pioneer work, in which they called high Machs those subjects whose scores fell in the upper range of the distribution (standard deviation above the median or fourth quartile) and low Machs who were placed in the lower range of the distribution (standard deviation below the median or first quartile). The subsequent studies have also frequently used separate categories on the Mach-scale for

the purpose of comparing Machiavellian and non-Machiavellian people (e.g. Burks, Carpenter, & Verhoogen, 2003; Gunnthorsdottir et al., 2002).

2. Method

2.1. Participants

150 students (69 males and 81 females, mage = 22.2 years, SD = 2.61) participated in the study. All volunteered to participate in the experiment. The participants received remuneration in the form of the amounts they won in the experimental game.

2.2. Experimental games

The participants had to face a competitive social dilemma situation in the experiment. Five subjects who were in the same room participated in each game. The participants received a code which ensured anonymity. They had to make a decision about a particular amount of money, which was provided by the experimenter, in five rounds. The question for the participants to consider was how much of this amount they would transfer to their own account and how much to put into the group's public account. At the end of each round, the experimenter doubled the amount that had been sent to the public account and redistributed it to the five players in equal proportion, irrespective of their actual contribution. The redistributed amount was transferred to their private account. Each of the participants could observe the contribution of their group members – identified by a code, listed on a board – to the public account and the profit they netted. We used folding screens to ensure that the players could not identify who was behind the codes. At the end of the fifth round the experimenter added up the amounts accumulated in the private accounts.

By the end of the game, only one of the five players received money, the one who accumulated the largest amount in his private account by the end of the fifth round. The winning strategy was to minimize the amount to be transferred to the public account and maximize the amount that remained in the private account.

2.3. Stimulus set

At the beginning of the study the participants filled out the Hungarian version of the temperament and character inventory (TCI) (Cloninger, Przybeck, Svrakic, & Wetzel, 1994) and the Mach IV test developed by Christie and Geis (1970).

2.3.1. Temperament and character Inventory

The Temperament and character Inventory is designed to measure seven personality traits. The temperament factors represent inherited patterns of processing environmental information and define the characteristic patterns of automatic responses by an individual to emotionally loaded stimuli. The four temperament factors (Novelty seeking, harm avoidance, reward dependence and persistence) are partly innate and relatively stable throughout people's entire lives, independent of culture and social influence. The other group of personality traits, the character factors (Self-directedness, cooperativeness, and self-transcendence) involve individual differences that gradually develop as a result of the interaction between temperament, family environment and personal experience (Cloninger et al., 1994).

2.3.2. Mach IV test

The Mach IV Test measures the skills and ability to manipulate others. The subjects of the experiment are asked to place different statements – taken, among others, from Machiavelli's

The Prince – on a scale of seven depending on the degree to which they agree or disagree with it. Such statements include the following: "The best way to handle people is to tell them what they want to hear" or "It is hard to get ahead without cutting corners here and there".

In the present study the mean score on Mach-IV was 102.56, the standard deviation was 16.3. ($\alpha = .77$) Following the methods of the previous studies (Burks et al., 2003; Christie & Geis, 1970; Gunnthorsdottir et al., 2002), we divided the distribution of the total scores into ranges along the standard deviation above and below the mean. Individuals scoring below 86 are grouped into the low Mach (LM) category and those scoring above 119 are classified as high Mach (HM) persons. By using this transformation, we categorized 26 individuals as low Machs (LM) and 26 individuals as high Machs (HM). In some of the analyses we used the full continuum of the Mach scale ($N = 150$), while some analyses were made with a narrowed sample containing only HM and LM individuals ($N = 52$).

2.4. Procedure

15 subjects participated in the experimental setting on each occasion. First we asked them to fill out the temperament and character inventory and a 20-item Mach IV Test. Then in groups of five they went into separate rooms where they participated in a competitive game under the guidance of an experimenter. After the game they all returned to the common room, and the experimenters collected all the test sheets and the sheets with the amounts of offers, each of which containing codes from the participants. Finally, we paid the prizes for the winner members one by one on the basis of the codes.

We compared the Mach scores of the participants with the personality factors measured by TCI, their behavioral strategies, the special features of their decisions and the amount of prizes that they had received.

3. Results

3.1. Personality characteristics

Pearson's correlation was used to analyze the relationship between the TCI temperament and character factors and the Mach scores. (The analysis was based on the full continuum of Mach scores.) The Mach scores showed a positive correlation with novelty seeking ($r = .28$, $p < 0.01$). There was a negative correlation between Mach scores and reward dependence ($r = -.24$, $p < 0.01$), self-directedness ($r = -.35$, $p < 0.01$), cooperativeness ($r = -.54$, $p < 0.01$) and self-transcendence ($r = -17$, $p < 0.05$).

3.2. Decisions made in social dilemma situations

The average contribution by the players declined over the game ($F(4,596) = 54.56$, $p < 0.001$). This decline held for both low Mach people ($F(4,100) = 13.45$, $p < 0.001$) and high Machs ($F(4,100) = 9.14$, $p < 0.001$). Compared to low Machs, high Mach persons offered less money to the public account in the first round ($F(1,51) = 6.39$, $p < 0.05$). When Bonferroni adjustment for multiple comparison was made the difference remained marginally significant ($t(50) = 2.58$, $p = 0.065$). There were no significant differences in the subsequent rounds between HM and LM people. (Fig. 1).

We found that Machiavellian (HM) people gained a higher profit by the end of the game, compared to the others. Using a dichotomous variable for Machiavellians, the prizes won by high Machs significantly exceeded those of low Machs ($F(1,51) = 1.73$, $p < 0.01$) (Fig. 2).
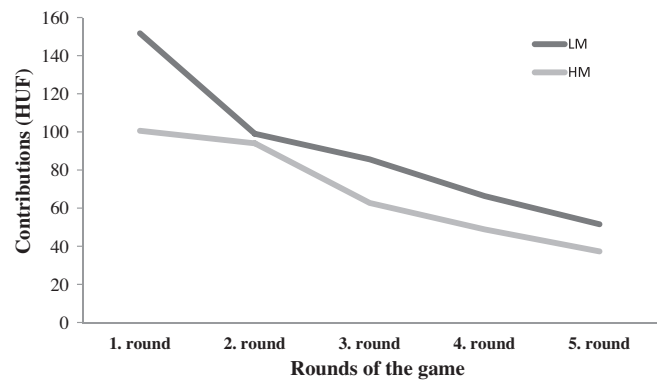

Fig. 1. Contribution of low Mach and high Mach individuals in each round of the experimental game.
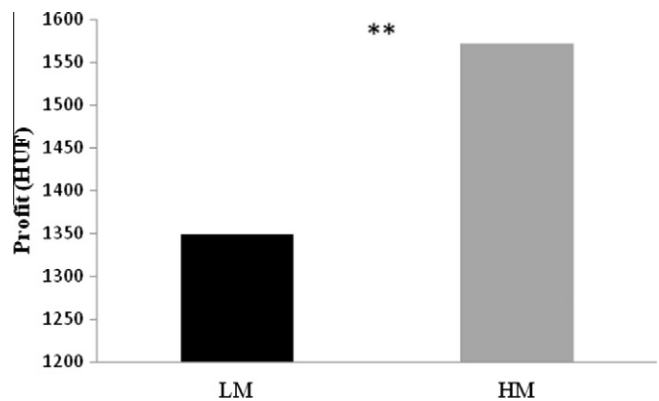

Fig. 2. Profit gained by low Mach and high Mach individuals at the end of the experimental game ($^{**}p < 0.01$).

The sex of the participants does not seem to influence the amounts of either contributions or payoffs. Sex had no significant effect on the total contribution over the five rounds ($F(1,52(=0.38$, $p > 0.05$), and Sex $*$ Mach interaction did not either influence the total contribution offered by the players ($F(1,52) = 0.31$, $p > 0.05$). The material benefits the players gained at the end of the game had been also not influent by the participants' sex and the Sex $*$ Mach interaction ($F(1,52) = 0.08$, $p > 0.05$; $F(1,52) = 0.31$, $p > 0.05$, respectively).

3.3. Regression analyses

We used linear regression analyses to examine the influence of the following variables on contributions: each player's offer in the previous round and the average contribution made by the other members of the group in the previous round. We examined the relative weight of these factors in the contributions of the players in each single round of the game. Since the players' previous decisions could not influence the players' actual decisions in the first round, we started our analysis with the second round.

Table 1 shows the effect of these variables on the contributions of the players for each move. It can be seen that low Machs' actual decisions were mostly influenced by their own contributions in each previous round. The other players' previous behavior had no influence on the amount they transferred to the group's account. The high Mach people's contributions were also influenced by the decisions they made in the previous rounds. However, contrary to low Machs, their actual offer to the public account was strongly influenced by the offers of fellow players in the previous rounds. A significant relationship was found in the second and fifth rounds, and a marginal significance in the third round. The data shows that

Table 1
Linear regression for the decisions (amount of money offered to the public account) of LM and HM persons in four subsequent rounds (2nd to 5th round).

Contributions	LowMachs			HighMachs		
	R^2	t	Beta	R^2	t	Beta
Individual's offer in the previous round	.24	2.53[**]	.46	.69	5.19[*]	.65
Average contribution made by the other members of the group in the previous round		.80	.15		2.73[**]	.34
Individual's offer in the previous round	.34	2.37[**]	.43	.63	4.44[*]	.63
Average contribution made by the other members of the group in the previous round		1.52	.27		1.89[***]	.27
Individual's offer in the previous round	.40	3.62[*]	.62	.44	4.03[*]	.72
Average contribution made by the other members of the group in the previous round		.24	.04		−.86	−.15
Individual's offer in the previous round	.23	2.31[**]	.43	.62	3.05[*]	.45
Average contribution made by the other members of the group in the previous round		.94	.17		3.19[*]	.47

[*] $p < 0.1$.
[**] $p < 0.05$.
[***] $p < 0.01$.

the lower the average offers of the others, the less the Machiavellian players paid to the public account.

4. Discussion

The patterns of average contributions made by individuals with high and low Mach scores were very similar. High Machs offered a less amount of money than low Machs in the first round but the difference did not remain significant over the subsequent rounds. Nevertheless, the profit of HM players significantly exceeded that of the LM players by the end of the game. Why are Machiavellians more successful than the other players?

We examined this question with regression analyses which showed that the high Machs took the behavior of others into account when they made their decisions but the low Mach persons did not. The contributions of Machiavellians were strongly influenced by the amount that the others offered to the public account in the previous round. On the other hand, the partners' perceived decisions did not seem to have an impact on the LM's actual contributions that was rather influenced by their own previous offers in every round.

This result suggests that Machiavellians evaluate the clues related to the behavior of partners and adjust their actual behavior accordingly. They appear more sensitive to signals in a social situation and more ambitious to monitor the others than low Machs. They start with a relatively low amount of contribution and do not exceed the others' contributions over the game. As a result, by the end of the game they are capable of gaining a higher profit, compared to low Machs. Machiavellian persons may be more flexible in their behavior, and exhibit a context-dependent behavior more than non-Machiavellians.

This strategic flexibility may be interpreted from an evolutionary perspective. The skillful manipulation of others conferred a significant adaptive advantage. Those who exploited opportunities to monitor the members of their group and adjust their behavior to that of others could enhance their inclusive fitness (Krebs & Dawkins, 1984). In the light of the Machiavellian Intelligence hypothesis, an evolutionary arm race could occur in which the increasingly cunning manipulative strategies used by some individuals selected for equally cunning counter-strategies in others so as to avoid being deceived or manipulated (Byrne & Whiten, 1988). The computational capacity of primates is created by the demands of tracking social relationships and evaluating the costs and benefits of alternative social actions (Dunbar, 2009). This resulted in selective pressures for a set of problem-solving abilities designed to use and exploit other individuals of the group without resulting the disruption of the group.

Low Mach people, on the contrary, may trust on personality, rather than situational factors. They offered a relatively large contribution to the public account at the beginning and do not

transfer less than high Machs over the game. Although the situation was mainly competitive, low Machs showed cooperative tendencies, at least at the beginning of the game. They seem to make their decisions on the basis of their internal norms more than high Machs. This assumption coincides with previous results showing that there is a strong negative correlation between Mach-IV and cooperation (TCI) scores (Paal & Bereczkei, 2007). Former studies also found that low Machs show a higher level of Agreeableness and empathy, compared to high Machs (Andrew et al., 2008; Austin et al., 2007). Further studies could clarify why people with low scores on Mach scale cannot resist their exploitation and under what circumstances their behavior may yield adaptive benefits.

At the same time, our results may be contrary to certain experimental results of former studies which, raises further questions. Recent research has clearly shown that Machiavellians have a worse than average mind-reading ability. Individuals with high Mach scores performed more poorly in every theory of mind test used before than low Machs (Ali, Amorim, & Chamorro-Premuzic, 2010; Lyons, Caldwell, & Schultz, 2010; Paal & Bereczkei, 2007). In addition, they are characterized by lower emotional intelligence and empathy, and are probably also less able to understand emotions (Austin et al., 2007; McIlwain, 2003). Some are driven to the conclusion from this that Machiavellians have poorer social cognitive skills than others. But how can they be successful in social tasks if they show these deficits?

Our results suggest that in spite of their lower mindreading ability, Machiavellian people may have certain cognitive skills that enable them to properly adapt to the challenges of social situations. They can utilize the previous movements of others and make beneficial decisions to maximize their profit. Similar results were found in a study in which it was possible to punish those who behaved as free-riders. Machiavellians made the largest profit by the end of the game, because they used an opportunistic strategy: they won a lot in the non-punishable phase by transferring as little money as possible, while in the punishable phase they avoided punishment by raising their contributions. Using an fMRI brain imaging technique, the authors found an elevation in the lateral orbitofrontal cortex in the punishment condition of the interpersonal game. This result suggests that high-Mach people are more skilled in detecting and processing the threat of punishment. On the other hand, lateral obitofrontal cortex is also involved in the motivational control of goal-directed behavior and has a fundamental role in making behavioral choices, particularly in unpredictable situations (Decety, Jackson, Sommerville, Chaminade, & Meltzoff, 2004; Elliott, Dolan, & Frith, 2000). It is possible, then, that flexible cognitive problem-solving processes are at work in the Machiavellians' decision-making (Jones & Paulhus, 2009).

Beside their particular cognitive abilities, certain personality traits of high Machs may also help them to develop a winning

strategy. Due to their low Cooperativeness scores, they probably do not feel that the norm of cooperation is compelling for them. Instead of moral values – whose lack is indicated by low scores on self-directedness and self-transcendence – they give priority to making direct benefit. This is also suggested by the fact that their scores on reward dependence – that measure a desire for social acceptance – are lower as compared to the LMs, probably because in an anonymous situation the reputation gaining is not really important for them (Bereczkei et al., 2010). Their high scores on the Novelty Seeking scale show that they are more likely than low Machs to take risks that may also contribute to their higher competitive ability. All of these personality factors could result in a personality constellation that helped Machiavellians win the game.

In addition to their cognitive abilities and personality characters, other factors may also have played a role in the successful transactions of Machiavellians. Maybe they have some kind of motivation in that they try to understand the possible reasons underlying the others' behavior. A recent study has demonstrated that while Machiavellians indeed perform under the average regarding mind-reading ability, they exhibit much stronger spontaneous readiness than the others to place themselves in the thoughts of others (Esperger & Bereczkei, in press). Another possible explanation for the success of Machiavellians is that high Mach persons are particularly skilled in controlling emotion. An emotional involvement in social encounters may prevent them from achieving their goal that is, exploiting others. (Knoch, Pascual-Leone, Meyer, Treyer, & Fehr, 2006). In accordance, a recent experiment found that during a social dilemma situation high Mach people, compared to low Machs, showed an increased activity of dorsolateral prefrontal cortex (dlPFC) that has long been recognized as crucially involved in cognitive control over emotions (Bereczkei, Deak, & Papp, submitted for publication). Further studies should be carried out to verify these possible explanations and in general to answer the question why Machiavellians can be successful although in terms of certain cognitive abilities they underperform others. Recently, Rauthmann and Will (2011) proposed a multidimensional, hierarchical account of Machiavellian content (affect, behavior, cognition, and desire) that can provide a more differentiated picture on structures and processes. An examination of the influence of these facets may help to answer the question above.

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