




Research Article

# “The Devil in Disguise”: A Test of Machiavellianism Instruments (the Mach-IV, the Machiavellian Personality Scale, and the Five Factor Machiavellianism Inventory)

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## ABSTRACT

The main aim of this study was to test the convergent, discriminant, and criterion validity of the Serbian adaptations of three Machiavellianism instruments (the Mach-IV, the short version of the Machiavellian Personality Scale – MPS-short, and the Five Factor Machiavellianism Inventory – FFMI) based on their relations with HEXACO traits, distress aspects (anxiety, depression, and stress), and emotion regulation strategies (suppression and reappraisal). The sample included 195 participants (80% were women) from Serbia, aged between 18 and 60 years, and the most of them were students. The results showed that the Mach-IV and the MPS-short are mutually more similar to each other and their main negative correlate is Honesty-Humility, while the FFMI appears to be distant from the other instruments and its main positive correlates are Extraversion and Conscientiousness and a negative one is Emotionality. Furthermore, the Mach-IV and MPS-short showed positive relations with distress aspects and non-adaptive emotion regulation (suppression), while the FFMI showed opposite patterns of relations. Since the FFMI captures the most items and facets, it explained the most variance of distress and regulation strategies, but the Mach-IV and the MPS-short, especially its amorality facet, showed significant incremental contribution in the explanation of anxiety, stress, and suppression. We discuss implications of the use of each of the three instruments.

*Keywords:* Machiavellianism, validity, personality assessment, distress, emotional regulation

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## Introduction

### The Measures of Machiavellianism

We can define Machiavellianism as a tendency to manipulate and exploit others in order to achieve personal goals related to cynical beliefs and pragmatic morality (Christie & Geis, 1970). Christie and Geis (1970) stated that the four fundamental characteristics of Machiavellianism are: lack of empathy enabling objectifying others, instrumental view of others aiding insincerity, seeing others rationally, and quick and efficient problem solving. Bereczkei (2016) underlines five key characteristics: manipulation, amorality, cynicism, emotional coldness, and lack of empathy. Although it refers to antisocial traits as callousness and the use of duplicitous tactics, the use of strategic approach (Jones & Paulhus, 2009) is also a characteristic of Machiavellianism.

The most widely used measure of Machiavellianism is the Mach-IV (Christie & Geis, 1970), which originally has three dimensions: tactics (manipulative tactics and justification of immoral behavior to achieve a goal), views (cynical worldview and the belief that humanity is untrustworthy and selfish), and morality (willingness to embrace immoral behaviors in order to achieve a goal). The Mach-IV is based on statements that are either drawn directly from Niccolò Machiavelli's original writings or are considered tapping the same construct. However, the Mach-IV has shown an unstable factor structure, especially across non-Western samples (see Fehr et al., 1992 for details). In a more recent study by Monaghan et al. (2018), results showed that the two-dimensional structure – comprising tactics and views – best describes the content of this instrument across samples from Korea, Hungary, Canada, USA, and Australia. However, in most research, the total score of Mach-IV is used since its utility has been convincingly demonstrated (see Fehr et al., 1992; Visser & Campbell, 2018).

Dahling et al. (2009) have also underlined the issues with reliability, scale structure, and some poor items of the Mach-IV and they developed a new instrument, the Machiavellian Personality Scale (MPS), based on the theoretical assumptions about the main characteristics of Machiavellianism. The scale has four dimensions: amorality, desire-for-control, desire-for-status, and distrust-of-

others and it has long and short forms. Although in their original study a confirmatory factor analysis supported a four-factor structure (Dahling et al., 2009), the factors showed inconsistent relations with empathy and some of them had low reliability (Miller et al., 2015). Moreover, in Chinese language, the use of a bifactor structure showed the best model fit, with only the desire-for-control subscale being more clearly defined and independent from the general Machiavellianism factor (Gu et al., 2017). The use on a Hungarian sample also revealed some discrepancies in comparison with the original scale: 1) instead of the desire-for-status, a new factor emerged (named: feeling-in-control) and 2) the amoral manipulation factor included only aspects of behaving and thinking non-ethically (Talmácsi et al., 2012). The authors believe that the alternative structure was obtained because of a student sample. However, the short versions in French and Italian languages showed a good model fit and reliability (Bianchi & Mirkovic, 2020).

Furthermore, Rauthmann and Will (2011) stated that what the Mach-IV measures is a very malleable and vague concept, and they believed that Machiavellianism may have a hierarchical structure of specific affects (e.g., interpersonal coldness), behaviors (e.g., exploitation), cognitions (e.g., negative perception of others), and desires (e.g., agentic motivation). Although there is no instrument based on their theoretical conception of Machiavellianism, these authors have highlighted that the focus of existing instruments is on characteristics such as cynical attitudes, immoral views, and manipulation, while neglecting others, like long-term planning and impulse control. There are certain additional measures of Machiavellianism, but they are used infrequently and measure even more specific aspects of Machiavellianism (behaviors or attitudes) or their content overlaps with the Mach-IV (for example, the German Machiavellianism Scale) or they are brief and consider Machiavellianism as unidimensional (e.g., the Machiavellianism scale from the Short Dark Triad and the Dark Triad Dirty Dozen).

A relatively newly introduced instrument is the Five Factor Machiavellianism Inventory (FFMI; Collison et al., 2018), which is based on expert estimations and ratings of the structure of Machiavellianism. The FFMI has three

main factors: antagonism (with the following facets: selfishness, immodesty, manipulativeness, callousness, and cynicism), agency (with the facets of: achievement, activity, assertiveness, competence, invulnerability, and self-confidence), and planfulness (with the facets of: deliberation and order), and it seems to capture all the relevant characteristics of Machiavellianism suggested by Rauthmann and Will (2011). Thus, the FFMI measures not only the antagonistic but also the strategic and goal-oriented aspects of Machiavellianism (captured by the agency and planfulness factors).

One rationale for a new instrument is that, according to theoretical expectations, there should be a positive relation between Machiavellianism and constraint. Collison et al. (2018) pointed out that previous Machiavellianism instruments showed negative relations with Conscientiousness, while the agency and planfulness factors from the FFMI, as well as the total score of the FFMI showed positive correlations with Conscientiousness and the antagonism factor showed negative (Collison et al., 2018; Kückelhaus et al., 2020). However, the planfulness factor showed a positive correlation with Agreeableness and the agency factor showed inconsistent correlations with Agreeableness facets, while only the antagonism factor, as well as the FFMI total score showed expected, strong and negative correlations with Agreeableness (Collison et al., 2018; Kückelhaus et al., 2020). Additionally, the FFMI antagonism factor showed high profile similarity with other Machiavellianism instruments (the Mach-IV, the MPS, the Machiavellianism scale from the Dark Triad Dirty Dozen instrument), but the total FFMI score showed low profile similarity with these traditional Machiavellianism measures when considering correlations with the NEO-PI-R and the HEXACO-PI-R (Kückelhaus et al., 2020). In line with that, the FFMI total score, as well as the agency factor, showed positive correlations with indicators of social competency and career success and negative with counterproductive work behavior, contrary to the antagonism factor, while both the total score and the antagonism factor showed negative correlations with emotion recognition (Kückelhaus et al., 2020). Kückelhaus and Blickle (2021) further confirmed the dissimilarity between the FFMI and traditional Machiavellianism instruments and showed that the FFMI total score positively correlates with interpersonal,

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occupational and workplace success, and that the agency factor influences these correlations.

Recently, a Serbian adaptation of the FFMI showed a three-factor solution (Dinić et al., 2021). Although there are some deviations from the expected factor structure (the immodesty facet had a marginally significant loading on the agency factor and not on the antagonism factor, and the achievement facet had a marginally significant loading on both order and antagonism factors, and not on the agency factor), the factor structure was mostly in line with the original solution. Results of this study showed that antagonism had positive and low correlations with alexithymia and psychological distress (anxiety, depression, and stress), while both agency and planfulness showed negative correlations with those variables, with agency getting higher correlations.

### Machiavellianism: Correlates and Outcomes

Machiavellianism is a member of the Dark Triad and Dark Tetrad constellation of socially malevolent traits (e.g., Paulhus, 2014). The central features within this constellation are lack of affective responsiveness and interpersonal manipulation (Dinić et al., 2020) or callousness as a facet of antagonism (Dinić et al., 2021). Therefore, Machiavellianism is related to deficits in emotional and social functioning. In their review, Jones and Paulhus (2009) concluded that Machiavellianism has shown consistent negative correlations with both empathy and emotion recognition. Considering the multidimensionality of empathy, following research showed that there were negative relations with affective empathy, while with cognitive empathy these were negative (Al Aïn et al., 2013) or non-significant (e.g., Dinić et al., 2018). A meta-analysis showed a negative link between Machiavellianism and ability emotional intelligence (Miao et al., 2018), and the most prominent correlate was emotion management (e.g., Vonk et al., 2015). Furthermore, there is a positive relation between Machiavellianism and a non-adaptive emotion regulation strategy, suppression of experienced emotions, but no relation with an adaptive strategy, cognitive reappraisal (Akram & Stevenson, 2021). Moreover, Côté et al.

(2011) showed that Machiavellianism has a small negative relation with emotion-regulation knowledge (awareness of the most effective strategies for modifying and nurturing emotions in particular situations). However, the moderation effect of emotion-regulation knowledge showed that persons with high Machiavellianism and good regulation knowledge pose a greater danger to other people.

Machiavellianism, as other dark traits, shows a negative relation with Honesty-Humility from the HEXACO model and with Agreeableness from the Big Five Model (e.g., Lee & Ashton, 2005). Characteristics such as recklessness and impulsivity, which are contained in Conscientiousness, are not part of the original conceptualization of Machiavellianism (e.g., Jones, 2016). However, in previous research which used the Mach-IV, it was shown that Conscientiousness was a negative correlate of Machiavellianism (e.g., Lee & Ashton, 2005). In the case of the FFMI, the results showed that the agency and planfulness factors were positively related to Conscientiousness and negatively to impulsivity, while the antagonism factor showed an opposite pattern of relations (Collison et al., 2018; Kückelhaus et al., 2020). Besides the characteristics shared with other members of the Dark Tetrad, Machiavellianism also shows unique relations with other traits. In a meta-analysis in which various measures of Machiavellianism were used, it has been shown that it is negatively related to Extraversion, Agreeableness and Honesty-Humility (when shared variance among the Dark Triad traits has been controlled for, see Muris et al., 2017). However, the agency and planfulness factors from the FFMI showed negative correlations with Neuroticism facets and agency also showed positive correlations with Extraversion facets, while antagonism showed positive or non-significant correlations with Neuroticism facets, and inconsistent, but mostly negative correlations with Extraversion facets (Collison et al., 2018; Kückelhaus et al., 2020).

Furthermore, Machiavellianism is related to various negative psychosocial outcomes, among which relations with interpersonal difficulties and antisocial behaviors stand out as the most prominent (Muris et al., 2017). However, when exploring relations with various mental health indicators, results were rather mixed (see a review by Jones & Paulhus, 2009). For example, one

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group of research showed that Machiavellianism (measured with the Mach-IV or MPS) had small to moderate positive relations with anxiety and depression (Al Ain et al., 2013; Bianchi & Mirkovic, 2020; Gómez-Leal et al., 2019), although in some studies only the relation with anxiety was significant (using a medical diagnosis of anxiety and a German Machiavellianism scale, see Malesza & Kaczmarek, 2019). Other authors have pointed out that there is no substantial link between Machiavellianism and depression (Bianchi & Mirkovic, 2020), while again others have found a weak negative correlation between depression and Machiavellianism (Bonfá-Araujo et al., 2021). Based on the original conceptualization of Machiavellianism, it should be unrelated to indicators such as anxiety and depression, given its detached functioning in situations of interpersonal conflict (e.g., Jones, 2016). However, in empirical validations, the relations with poor mental health indicators are mostly positive, but weak (for a review, see Jones, 2016). Thus, there is a warranty for further exploration of its relations with mental health indicators considering different measures of Machiavellianism.

## The Present Study

The main aim of this research is to examine the convergent, discriminant, and criterion validity of the Serbian adaptations of three Machiavellianism instruments (the Mach-IV, the MPS, and the FFMI), which were based on different theoretical approaches and methodologies (e.g., items were created using Niccolò Machiavelli's statements or expert estimations and ratings) and to add to the further understanding of mental health correlates of Machiavellianism. More precisely, we examine the convergent and discriminant validity of the Machiavellianism instruments via correlations with HEXACO traits. In line with previous research (e.g., Lee & Ashton, 2005), we expect that the main correlate of all instruments that measure Machiavellianism would be Honesty-Humility (convergent validity), while correlations with other HEXACO traits should be lower (discriminant validity). Besides Honesty-Humility as a main correlate, we assume that Agreeableness will also show significant negative correlations with Machiavellianism instruments, providing further validity



evidence for malevolent and socially aversive characteristics of Machiavellianism. In line with theoretical assumptions (e.g., Jones, 2016), we expect Machiavellianism measures to correlate positively with Conscientiousness, which would indicate a planful and strategic approach present in Machiavellians. For the rest of the personality traits, we do not expect to find substantial correlations, but we could anticipate to find significant correlations depending on the measured aspect of Machiavellianism (e.g., since the FFMI also measures the agency aspect, we could expect a positive correlation with Extraversion, see Collison et al., 2018). Furthermore, criterion validity is being examined via its relations with psychological distress and emotion regulation strategies. We presume to find a positive relation between Machiavellianism instruments and mainly non-adaptive emotion regulation strategies (e.g., expressive suppression, see Akram & Stevenson, 2021) and distress aspects (e.g., Al Aïn et al., 2013; Jones, 2016). In addition to this, since the FFMI is a more comprehensive instrument compared to the Mach-IV and the MPS and it captures not only antagonism, but also the agency and planfulness aspects of Machiavellianism (Collison et al., 2018), we will explore the incremental validity of the Mach-IV and the MPS to find out which are the criterion validity measures over and above the FFMI. We expect that the Mach-IV and the MPS will not show significant incremental validity over and above the FFMI, since the antagonistic aspect that they cover should be already captured by the FFMI. Finally, to get better insight into their similarities and differences, shared and specific content, we will explore a joint factor analysis of these three instruments.

## Method

### Participants and Procedure

The sample included 195 participants (80% women) from Serbia, aged between 18 and 60 years ( $M = 24.60$ ,  $SD = 8.52$ ). Most of the participants were students (71.30%) and 21.50% had a college or university degree. A convenience sample was used, and it consisted mainly of students who took part in the study for course credits. The rest of the participants were required via social networks,

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by snowball sampling. Data were collected online via the Google Forms platform, anonymously. The instruments had a pre-defined order; we administered the FFMI first, then the MPS, HEXACO-60, Mach-IV, ERQ, DASS-21, followed by questions about socio-demographic characteristics. Study was approved by the Ethical Committee of the Department of Psychology, Faculty of Philosophy, University of Novi Sad, Serbia, which is the Second Instance Commission of the Ethical Committee of the Serbian Psychological Society (code 201810260923\_BSQL).

## Instruments

### *Mach-IV*

The Mach-IV (Christie & Geis, 1970, for the Serbian adaptation see Međedović & Petrović, 2015) has 20 items measuring manipulative tactics, a cynical attitude to human nature and pragmatic morality. The response format is a 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*).

### *Machiavellian Personality Scale – short form*

The Machiavellian Personality Scale – short form (MPS-short; Dahling et al., 2009) has 16 items distributed into four facets: amorality (5 items), desire-for-control (3 items), desire-for-status (3 items), and distrust-of-others (5 items). This was the first use of the scale in Serbian language and for this purpose the authors of this study translated the English version to Serbian and it was back-translated to English by a professional English language lecturer in order to ensure the original meaning (see translation at <https://osf.io/uv93z/>). The response format is a 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*).

### *Five Factor Machiavellianism Inventory (FFMI)*

The Five Factor Machiavellianism Inventory (FFMI; Collison et al., 2018, for Serbian adaptation see Dinić et al., 2021) contains 52 items, which measure 13 facets (all facets have four items) distributed into three factors: 1) antagonism (20 items), which captures the facets of selfishness (low altruism) (4 items), immodesty (4 items), manipulativeness (4 items), callousness (4 items), and cynicism (4 items); 2) agency (24 items), which captures the facets of

achievement (4 items), activity (4 items), assertiveness (4 items), competence (4 items), self-confidence (4 items), and invulnerability (4 items); and 3) planfulness (8 items), which captures two facets: deliberation (4 items) and order (4 items). The response format is a 5-point Likert scale (from 1 = *disagree strongly* to 5 = *agree strongly*).

#### *HEXACO-60*

The HEXACO-60 (Ashton & Lee, 2009, for the Serbian adaptation see Sokolovska et al., 2018) measures six basic personality traits (each with 10 items): Honesty-Humility, Emotionality, Extraversion, Agreeableness (versus Anger), Conscientiousness, and Openness to Experience, each containing four facets. The response format is a 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*).

#### *Emotion Regulation Questionnaire (ERQ)*

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003, for the Serbian adaptation, see Popov et al., 2016) measures two emotional regulation strategies: expressive or emotional suppression (4 items) and cognitive reappraisal (6 items). The response format is a 7-point Likert scale (from 1 = *strongly disagree* to 7 = *strongly agree*).

#### *Depression Anxiety Stress Scale (DASS-21)*

The Depression Anxiety Stress Scale (DASS-21; Lovibond & Lovibond, 1995, for the Serbian adaptation see the official website <http://www2.psy.unsw.edu.au/Groups/Dass/Serbian/Serbian.htm>) measures three domains of psychological distress (each with 7 items): depression, anxiety, and stress. The response format is a 4-point Likert scale (from 0 = *did not apply to me at all* to 3 = *applied to me very much, or most of the time*).

In Table 2, there are the descriptive statistics and alphas for all the instruments used.

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## Data Analysis

First, we calculated a model fit for all three instruments – the Mach-IV, the MPS, and the FFMI. Because of the violation of multivariate normality, we used a robust diagonally weighted least squares (DWLS) estimator. The evaluation of the model fit was in line with recommendations of Hu and Bentler (1999): for a good fit *RMSEA* and *SRMR* should be  $< .06$ , and *TLI* and *CFI*  $> .95$ , and for an acceptable fit *RMSEA* and *SRMR* should be  $< .08$  and *TLI* and *CFI*  $> .90$ . The model fit was calculated in R package “lavaan” (Rosseel, 2012).

Second, mutual correlations between the various Machiavellianism instruments, as well as between Machiavellianism instruments and other validity measures (HEXACO, emotion regulation, and distress scales) were calculated. For multiple comparisons, Bonferroni *p*-correction was applied ( $.05/36 = .00143$ , see Table 2). In order to check profile similarity across correlations with validity measures, the Cronbach and Gleaser’s (1953) *D* statistic based on Euclidean distances was used with lower values showing greater profile similarity. *D* can be interpreted as Cohen’s *d* (Cohen, 1992), meaning that values of and above  $.20$  can be considered as a small effect indicating similar profiles, values of  $.50$  and above as a medium effect and showing moderately similar profiles, and the value of  $.80$  and above as a large effect and dissimilar profiles.

Third, a regression analysis was used to test the explained variance of validity measures based on each of the three Machiavellianism instruments. Additionally, we conducted a hierarchical regression analysis in order to test the incremental contribution of the Machiavellianism instruments. In this analysis, in the first step, we entered the instrument that explained the highest percentage of variance in the previous regression analysis, and the rest of the instruments in the second step.

Finally, we conducted a factor analysis (principal axis factoring method) on the Machiavellianism instruments and their subscales in order to test whether they formed a one-factor solution and refer to the same construct. The number of factors was tested based on a parallel analysis (O’Connor, 2000) and promax rotation was used for the interpretation of the factors. As significant loadings

were considered those higher than  $\pm .32$  (Tabachnick & Fidell, 2019). All analyses from the second step were calculated in IBM SPSS for Windows v26 (IBM Corp., 2019). Data and the instruments are available at <https://osf.io/uv93z/>.

## Results

### Factor Structures of the Machiavellianism Instruments

#### *Mach-IV.*

Since a one-factor solution is usually used for the Mach-IV, we firstly tested this solution. The model fit was unsatisfactory (Table 1). The modification indices have suggested to include residual correlations between two negatively formulated items (item 9 “*Most people are brave.*” and item 14 “*Most people are basically good and kind.*”), which improved the fit. We also tested the two-factor model solution based on Monaghan et al. (2018), which includes only 10 items, but it showed an overfit, with a correlation between the factors of .52. Given that the total score of the Mach-IV is mostly used in research and considering the overfit of the alternative model and the satisfactory model fit of the modified one-factor solution, we kept the total score in further analyses.

#### *MPS-short.*

The proposed four-factor model showed a satisfactory model fit. The alphas for facets ranged from .48 (desire-for-status) to .65 (desire-for-control) and the omegas ranged from .49 (amorality) to .64 (desire-for-control), which can be considered as adequate given the small number of items per several facets.

#### *FFMI.*

Since previous research regarding the exploration of the factor structure of the Serbian adaptation of the FFMI used an exploratory factor approach (Dinić et al., 2021) in line with the original study (Collison et al., 2021), the model fit for the three-factor solution was assessed using an exploratory structural equation modeling (ESEM) approach. The results showed an excellent model fit. However, the latent structure is somewhat different from the original solution, with facets of achievement and immodesty showing high loadings on the planfulness factor,

along with deliberation, while order from the original planfulness factor showed marginal loadings on all factors. Having this in mind, we will use facet scores in the main analyses. Cronbach's alphas for the facets ranged from .52 (selfishness) to .75 (order) and omegas ranged from .47 (selfishness) to .75 (order). These values can be considered as adequate and acceptable given the small number of items per some facets.

**Table 1**  
**The model fit of three Machiavellianism instruments**

Instruments	Models	DWLS $\chi^2(df)$	<i>p</i>	CFI	TLI	RMSEA (90% CI)	SRMR
Mach-IV	one-factor	299.31 (170)	< .001	.886	.873	.063 (.051 - .074)	.091
	modified one-factor	279.41 (169)	< .001	.903	.891	.058 (.046 - .070)	.087
	two-factor	31.45 (34)	.593	1.00	1.00	.000 (.000 - .047)	.058
MPS-short	four-factor	165.25 (98)	< .001	.925	.908	.059 (.043 - .075)	.084
FFMI	three-factor	42.98 (42)	.429	.999	.997	.011 (.000 - .050)	.054

*Note.* For the exploration of the FFMI, ESEM was used in line with the original study (Collison et al., 2021), while for the exploration of the Mach-IV and the MPS, CFA was used.

## Convergent and Discriminant Validity of the Machiavellianism Instruments

Correlations among the three instruments have shown that the Mach-IV and the MPS-short are more similar to each other compared to the FFMI (Table 2). Both the Mach-IV and the MPS-short showed the highest negative correlations with Honesty-Humility among the HEXACO traits, while the FFMI showed this with Extraversion in a positive direction, followed by Conscientiousness (positive) and Emotionality (negative). Furthermore, both the Mach-IV and the MPS-short showed positive correlations with distress aspects and expressive suppression, while the FFMI showed negative correlations with distress aspects and positive with cognitive reappraisal. The results on profile similarity showed that the Mach-IV and the MPS-short are very similar ( $D = .18$ ),

while the FFMI is very distant from both the Mach-IV ( $D = 2.23$ ) and the MPS-short ( $D = 2.08$ ).

**Table 2**

**Correlations between Machiavellianism scales and personality, distress, and emotional regulation scales**

Instrument	Scale or subscale	$M(SD)$	$\alpha$	Mach-IV	MPS	FFMI
Mach-IV		2.72(0.49)	.79	1		
MPS-short		2.53(0.52)	.77	.70***	1	
FFMI		3.05(0.33)	.80	.27***	.39***	1
HEXACO-60	Honesty-Humility	3.69(0.70)	.75	-.53***	-.65***	-.25***
	Emotionality	3.30(0.67)	.73	-.17*	-.03	-.40***
	Extraversion	3.19(0.72)	.80	-.11	-.02	.51***
	Agreeableness	2.99(0.68)	.75	-.25***	-.35***	-.20**
	Conscientiousness	3.68(0.69)	.82	-.22**	-.13	.42***
	Openness	4.00(0.69)	.78	-.16*	-.16*	-.05
DASS-21	Depression	0.74(0.68)	.87	.35***	.26***	-.30***
	Anxiety	0.81(0.73)	.86	.26***	.26***	-.22***
	Stress	1.27(0.76)	.88	.31***	.31***	-.24***
ERQ	Cognitive reappraisal	4.97(1.14)	.76	-.08	-.03	.21**
	Expressive suppression	3.62(1.31)	.82	.34***	.26***	.11

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

Regarding the FFMI facets, the highest correlations were found between assertiveness, self-confidence, competence and Extraversion, all in a positive direction; order, competence, activity and Conscientiousness, all in a positive direction; invulnerability and Emotionality in a negative direction; and manipulation, immodesty and Honesty-Humility, in a negative direction (a full correlational matrix can be found at <https://osf.io/uv93z/>). Since the FFMI captures diverse aspects of Machiavellianism and considering the results of the model fit, further analyses were run on the facet level for both the FFMI and the MPS-short.

### Criterion Validity of the Machiavellianism Instruments

Results of the regression analyses showed that the FFMI facets explained

the highest percent of variance of the criterion variables (Table 3), which could be expected since the FFMI captures the highest number of items and facets. The results of the hierarchical regression analysis showed that the Mach-IV and the MPS-short amorality facet had an incremental contribution over and above the FFMI facets in the explanation of anxiety, stress, and suppression (Table 4).

**Table 3**

**Explained variance ( $R^2$ ) of distress and emotional regulation scales based on Machiavellianism scales**

Regression analysis	Criterion				
	Depression	Anxiety	Stress	Cog. reap.	Ex. supp.
$R^2$ Mach-IV	.12***	.07***	.10***	.04	.23***
$R^2$ MPS-short	.12***	.12***	.17***	.03	.24***
$R^2$ FFMI	.37***	.40***	.50***	.12*	.29***
Hierarchical regression analysis					
$R^2$ FFMI	.40***	.37***	.50***	.12*	.29***
$\Delta R^2$ Mach-IV and MPS-short	.03	.05**	.06***	.03	.11***
$R^2$ Total	.43***	.43***	.55***	.16*	.39***

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

Among the FFMI facets, the main predictors of anxiety were deliberation and achievement in a positive and invulnerability in a negative direction; the main predictors of stress were achievement in a positive and invulnerability and callousness in a negative direction; and the main predictors of suppression were assertiveness in a negative and invulnerability in a positive direction (Table 4). Depression could be predicted by competence and invulnerability in a negative and immodesty in a positive direction. Although the first step showed a significant explanation of the variance of reappraisal, only cynicism showed a marginally significant and negative effect. The second step showed no significant contribution in the explanation of reappraisal, but among the variables in this step desire-for-control showed a significant negative effect. Taken together, the results showed that the Mach-IV and a specific facet of the MPS-short - amorality - had an incremental contribution over and above the FFMI facets, but this validity was limited to specific aspects of distress and emotion regulation strategies.



**Table 4**

**Hierarchical regression analysis: Contributions ( $\beta$ ) of Machiavellianism scales in the prediction of distress and emotional regulation scales**

1 <sup>st</sup> step (FFMI)	DASS-21			ERQ	
	Depression	Anxiety	Stress	Cog. reap.	Ex. supp.
achievement	.01	.18*	.18**	.05	.06
activity	-.15	.07	.00	.08	-.09
selfishness	-.13	-.02	.02	.05	-.05
assertiveness	-.07	-.13	-.13	-.01	-.20*
competence	-.27**	-.14	-.10	.18	.10
deliberation	.01	.24***	.07	-.03	.04
invulnerability	-.19**	-.35**	-.48***	.07	.26***
immodesty	.17*	-.08	.03	-.05	-.12
order	-.03	-.02	.05	-.01	.09
self-confidence	-.09	-.06	-.08	.12	-.03
manipulation	-.02	.12	-.02	.11	-.04
callousness	.06	-.15	-.14*	-.02	.11
cynicism	-.03	-.09	-.06	-.16+	.09
2 <sup>nd</sup> step (Mach-IV and MPS-short)					
Mach-IV	.17	.22*	.19*	-.01	.19*
amorality	.13	.19*	.22**	-.01	.33***
desire-for-control	-.09	.02	.04	-.21*	-.10
desire-for-status	-.03	.03	-.00	-.03	-.02
distrust-of-others	.00	.08	-.09	.15	.07

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ , +  $p = .059$ .

## Latent Structure of the Machiavellianism Instruments

The latent structure of the Machiavellianism construct was examined based on principal axis factoring of the Mach-IV and facets from the MPS-short and the FFMI. The results of the parallel analysis suggested four factors. However, the 4<sup>th</sup> factor comprised only one facet (order from the FFMI), and a few more variables which had significant secondary loadings. Therefore, we kept the three-factor solution. Based on the pattern matrix (Table 5) the first factor was

interpreted as Dominance, which comprises three facets from the MPS-short and several facets from the FFMI among which achievement showed the highest loading. The second factor was named Agency, and it mainly comprises the FFMI agency facets. The third factor was named Antagonism, and it comprises the Mach-IV, amorality from the MPS-short, and antagonism facets from the FFMI. We should note that facets from the MPS-short and the FFMI are mixed in the final factor solution, i.e., the factors were not composed of facets from only one instrument. The first and the third factor showed a moderate correlation of .49, while the first and the second (.19) and the second and the third factor (-.12) showed low correlations.

**Table 5****Pattern matrix of a joint factor analysis of Machiavellianism scales**

	Dominance	Agency	Antagonism
FFMI achievement	.78		
MPS-short desire-for-status	.71		
MPS-short desire-for-control	.65		
MPS-short distrust-of-others	.55		
FFMI immodesty	.53		
FFMI deliberation	-.47		
FFMI manipulation	.43		.40
FFMI competence		.92	
FFMI self-confidence		.72	
FFMI assertiveness		.69	
FFMI activity		.58	
FFMI order		.39	
FFMI invulnerability		.33	
Mach-IV			.72
FFMI cynicism	-.34		.71
MPS-short amorality			.63
FFMI selfishness			.50
FFMI callousness			.47

*Note:* Loadings lower than .32 were omitted.

## Discussion

The results of this study showed that the three Machiavellianism instruments capture different aspects of Machiavellianism, with the Mach-IV and the MPS-short showing higher mutual similarity compared to the FFMI. This is in line with different theoretical assumptions based on which these three instruments were developed, with the FFMI capturing aspects of low impulsivity and planfulness, besides the major aspects of Machiavellianism, which refer to antagonistic traits (Collison et al., 2018; Kückelhaus et al., 2020; Kückelhaus & Blickle, 2021).

The differences between the instruments were the most obvious in relation to Honesty-Humility, with the Mach-IV and the MPS-short showing higher correlations with this trait compared to the FFMI. Honesty-Humility was considered as a common core of dark traits, including Machiavellianism (e.g., Lee & Ashton, 2005), as it captures the antagonistic aspects of these malevolent traits. Since the FFMI measures other than antagonistic aspects of Machiavellianism, it showed high correlations with other traits, e.g., positive with Extraversion and Conscientiousness and a negative one with Emotionality, which is in line with Collison et al. (2018). These results point out that the dominant aspect of the FFMI is grandiosity and agency followed by callousness, and not antagonism per se. Therefore, the FFMI captures some positive aspects of the human nature, personal capacities, and strengths, along with emotional detachment. In previous studies (e.g., Kückelhaus et al., 2020) it was pointed out that Machiavellianism measured by the FFMI captures the use of aggressive behavior in a strategic and controlled manner; however, in the cited study the positive relations between the total FFMI scores and malevolent behaviors (counterproductive work behaviors) were missed, while the antagonistic factor showed positive and agency and planfulness showed negative small correlations with counterproductive work behaviors.

The difference between the three instruments is further confirmed by their relations with criteria variables. While the Mach-IV and the MPS-short were positively correlated with distress aspects and expressive suppression, which is

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in line with previous research (e.g., Akram & Stevenson, 2021; Al A'in et al., 2013), the FFMI showed negative relations with distress and positive ones with cognitive reappraisal. These results highlight the negative outcomes of the antagonistic aspects of Machiavellianism not only for others but also for the self and one's own mental health. However, it seems that the FFMI also captures adaptive functioning, such as constructive strategies of emotional regulation (cognitive reformulation, according to Gross & John, 2003) and reduced distress.

Considering the comprehensiveness of the FFMI, it is not surprising that it explained most of the criteria variance and that the facets from the FFMI were the strongest predictors of distress measures. More precisely, invulnerability was the consistent negative predictor of all distress aspects, but a positive one of expressive suppression, while competence was a negative predictor of depression. This is in line with a previous study that showed that anxiety and depression from the Five Factor Model showed negative relations with the agency factor, which captures invulnerability and competence (Collison et al., 2018). These results reflect the resiliency of the agentic aspect of Machiavellianism. However, the positive relation of the invulnerability facet and a mainly non-adaptive emotion regulation strategy (expressive suppression) adds to the potential cost of using manipulative strategies in order to cover or block emotions. In contrast, assertiveness was a negative predictor of expressive suppression, confirming the advantage of the tendency to openly and directly show one's own opinions and feelings. Furthermore, deliberation was a positive predictor of anxiety, which is in line with Collison et al. (2018), who showed a positive relation of anxiety from the Five Factor Model and the planfulness factor, which captures deliberation.

Despite the comprehensiveness of the FFMI, results also showed that both the Mach-IV and the amorality facet from the MPS-short showed significant incremental contribution in the explanation of some of the distress aspects and a non-adaptive emotion regulation strategy, over and above the FFMI. This is not in line with our expectation that FFMI will subsume both the Mach-IV and the MPS-short due to its comprehensiveness. However, this result

could indicate that some of the antagonistic aspects of the Mach-IV and the MPS-short are unique and not redundant to the FFMI.

Results of the joint factor analysis further contribute to the distinction of these three Machiavellianism instruments and have shown that three factors could be extracted from them - dominance, agency, and antagonism. The antagonism factor captures the core of Machiavellianism and all three Machiavellianism instruments contribute to this factor: the Mach-IV, the amorality from the MPS-short, and three facets from the original FFMI antagonism factor. This result is in line with Collison et al.'s (2018) notion that Machiavellianism instruments mainly measure the antagonistic aspect of this construct. This factor mainly covers egoistic and cold-hearted behavioral tactics, which can include amoral behaviors such as lying and being dishonest.

The factor named dominance captures three facets from the MPS-short, two from the FFMI antagonism factor (immodesty and manipulation), one from the FFMI agency factor (achievement), and one from the FFMI planfulness factor (deliberation). The main content of this factor is related to agentic traits, and it captures social potency and desire for control and status, but in combination with antagonistic and manipulative tactics. Achievement and desire-for-status had the main loading on this factor. We must note that in the original study (Collison et al., 2018), achievement had a secondary loading on the antagonism factor. Thus, it cannot be seen as solely an aspect of agency, and this was also confirmed by our results. Furthermore, in a previous study about the Serbian adaptation of the FFMI, immodesty had also had a significant loading only on the agency factor (Dinić et al., 2021), suggesting the complex meaning of this facet.

Finally, the agency factor captures only the FFMI facets and the majority of them are from the original FFMI agency factor with competence showing the highest loading, which is in line with the previous study dealing with the Serbian adaptation of the FFMI (Dinić et al., 2021). This factor has low correlations with the rest of the factors, and it is a sole characteristic of the FFMI.

The factor that refers to long-term planning and a need for order was not extracted in our study, but we have found two factors of agency - one with and one without antagonistic aspects. It should be mentioned that in Collison et

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al. (2018), two factors of the FFMI were suggested by a parallel analysis and a minimum average partial (MAP) test, but the authors kept three factors as most interpretable, although the agency and planfulness factors achieved relatively high-profile similarity. Future studies should address the status of planfulness, as well as the unique aspects of agency in Machiavellianism and its relations with malevolent outcomes.

Based on all results, we can conclude that the content of the FFMI is not referring to malevolence in the same way as other traditional Machiavellianism scales. Miller et al. (2017) have pointed out that it is difficult to write items that assess low Agreeableness and high Conscientiousness, which represent the agency factor of Machiavellianism, a distinctive feature in comparison to psychopathy. Thus, it is a challenge to develop a measure of the agentic aspects of Machiavellianism without capturing adaptive aspects of interpersonal and emotional functioning. Although the FFMI captures inhibition, constraint, and good impulse control, as the authors originally proposed, it showed rather low and modest correlations with indicators of antagonism within the basic personality traits. Therefore, we could conclude that the FFMI captures some aspects of antagonism as the main characteristics of Machiavellianism, but not in the expected amount. The key characteristics that the FFMI captures when we consider the total score are the strategic, dominant, and agentic aspects of Machiavellianism. As the factors of the FFMI showed the expected relations with validity variables, we suggest that scores on the proposed factors should be used in future studies instead of the total score. The factor structure of the FFMI should be also further explored.

There are several limitations of this study. First, all correlates and outcomes were measured by self-report instruments. Future studies should include behavioral indicators of mental health and other validity constructs, such as cheating, or indicators of social deviance that need to include strategic planning. Second, the majority of participants were students and women, which limits the generalizability of the results. Third, some facets had low reliability coefficients (e.g., selfishness from the FFMI), thus conclusions based on them should be taken with caution. Fourth, we used MPS-short instead of the full MPS

and future studies could explore whether the same results would be obtained through the usage of the full MPS version.

Despite these limitations, the contribution of this study is that it offers a better insight into the validity of three Machiavellianism instruments, considering their relations with personality traits and emotional and mental health functioning. In the case when there is a need for in-depth assessment of Machiavellianism, which includes not only the antagonistic aspects of this trait, but also the agency aspect, the FFMI could serve as an instrument of choice using a factor level analysis and not the total score. However, in the situations of screening or when only a global measure of Machiavellianism is enough, the Mach-IV and the MPS, especially its amorality facet, could be used.

#### *Conflict of interest*

We have no conflicts of interest to disclose.

#### *Data availability statement*

Data used in this paper is available at: <https://osf.io/uv93z/>.

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