

# **Development and Validation of a Digital Work Simulation to Assess Machiavellianism and Compliant Unethical Behavior**

Masterthesis of Lonneke Dubbelt (321186)

Institute of Psychology  
Faculty of Social Sciences  
Erasmus University Rotterdam

First supervisor: Janneke Oostrom  
Second supervisor: Annemarie Hiemstra

Internship supervisor: Joost Modderman

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## **Development and Validation of a Digital Work Simulation to Assess Machiavellianism and Compliant Unethical Behavior**

Workplace deviance is a costly problem in organizations, but current measurements of workplace deviance are problematic. A digital work simulation was developed to predict workplace deviance by measuring Machiavellianism and Compliant Unethical Behavior. Two studies were conducted to establish the validity of the digital work simulation. Study 1 (N = 113) aimed at establishing the construct validity of the simulation. The results showed that the simulation is measuring Machiavellianism and Compliant Unethical Behavior. Machiavellianism as measured in the simulation is related to Agreeableness and Honesty-Humility, and Compliant Unethical Behavior as measured in the simulation is related to Neuroticism and self-esteem. Study 2 (N = 285) aimed to establish the criterion-related validity of the simulation and showed that the simulation predicts workplace deviance, and incrementally predicts organizational deviance over and above two existing questionnaires of Machiavellianism and Compliant Unethical Behavior. Furthermore, Machiavellianism as measured in the simulation is less susceptible to social desirable answering compared to self-report items. Thus, a digital work simulation provides practitioners with a new method of measuring workplace deviance.

**Keywords:** digital work simulation, Machiavellianism, Compliant Unethical Behavior, workplace deviance

Deviant workplace behaviors regularly make headlines. Reports vary from fraudulent behaviors, to theft, to bullying. Deviant workplace behavior can result in high turnover rates, bankruptcy, and in impaired business reputation (Kaptein, 2008; Levy & Tziner, 2011). Workplace deviance is defined as voluntary and intentional behavior that harms the organization by violating organizational norms (Robinson & Bennett, 1995). It has been estimated that the annual costs of deviant workplace behavior must be staggering, since theft alone costs organizations an estimated \$200 billion annually (Vardi & Weitz, 2004). Kish-Gephart, Harrison, and Treviño (2010) suggest that deviant workplace behavior has three antecedents; the organizational environment, the issue itself, and the individual. The latter is the focus of the present article. Because of the severe consequences of deviant workplace behavior, it may be valuable to organizations to be able to assess whether job candidates have a tendency for deviant workplace behavior.

Current measurements of deviant behavior at the individual level face a variety of problems. First, most measurements rely on self-reports (Bennett & Robinson, 2000; Mount, Ilies, & Johnson, 2006). However, the value of self-report measures is restricted due to their susceptibility to social desirable answering (Stewart, Bing, Davidson, Woehr, & McIntyre, 2009). Furthermore individuals tend to rationalize their own behavior, which results in a

biased report of that behavior. Other-reports of deviant behaviors are limited as well, because observers often have a restricted opportunity to observe behavior of others and a halo bias may influence the judgment of an observer (Mount et al., 2006).

The present article introduces a new measurement method of deviant workplace behavior that may help to overcome the disadvantages associated with the assessment of this type of behavior; a digital work simulation. Simulations are contextualized selection and assessment procedures that psychologically or physically mimic key aspects of a job (Lievens & De Soete, 2012). Simulations have been found to incrementally predict job behaviors over and above more traditional measurements of cognitive ability and personality (Lievens & De Soete, 2012) and applicants prefer simulations over cognitive ability tests, personality questionnaires, and biodata (Hausknecht, Day, & Thomas, 2004). Furthermore, simulations are difficult to fake (Lievens & De Soete, 2012) and show less adverse impact than paper-and-pencil tests (Schmitt & Mills, 2001). The aim of the present article is to examine the validity of a digital work simulation to predict deviant workplace behavior. Study 1 will focus on the construct validity and Study 2 will focus on the criterion-related validity of the digital work simulation. First a theoretical overview of workplace deviance and digital work simulations will be provided. Then, the two studies will be described in more detail.

### **Workplace Deviance**

As described above, workplace deviance is behavior that harms the organization by violating organizational norms (e.g., theft, property destruction, drug use, alcohol use; Robinson & Bennett, 1995). These organizational norms consist of rules formulated by the organization, and can also adhere to societal norms (Bennett & Robinson, 2000). A framework has been made to distinguish between different forms of workplace deviance, namely interpersonal deviance and organizational deviance (Robinson & Bennett, 1995; Sackett, 2002). Organizational deviance refers to behavior harmful to the organization, like theft, taking longer breaks, and withholding effort (Mount et al., 2006). Interpersonal deviance consists of behavior directed at others in the organization, such as teasing, cursing, or rude behavior. Deviant behaviors vary along a dimension of seriousness (Robinson & Bennett, 1995). A minor offense like leaving early is less harmful to the organization as compared to a serious offense like sexual harassment.

Since deviant workplace behavior is a common problem in organizations, it is expected that employees not always initiate this behavior, but may also be forced to behave in an unethical way by others (Anand, Ashforth, & Joshi, 2004; Beu & Buckley, 2004). This

implies that employees exhibit proactive (i.e., initiate deviant behaviors themselves) and reactive behavior (i.e., comply with deviant behaviors of others). Proactive behavior concerns actively seeking information and opportunities to attain goals, and actively influencing the environment (Crant, 2000). Examples of proactive deviant behaviors are ingratiation, intimidation, and Machiavellianism (Crant, 2000; Gardner & Martinko, 1988).

Machiavellianism can be seen as proactive behavior, since it is described as actively engaging in amoral manipulation and controlling others (Dahling, Whitaker, & Levy, 2009).

Machiavellianism is in contrast with reactive behavior, which entails behavior adaptation to the environment (Crant, 2000). Forms of reactive behavior are avoiding conflicts and complying with unethical requests of others (Gudjonsson, Sigurdsson, Bragason, Einarsson, & Valdimarsdottir, 2004; Wahn, 2003). Because compliance with deviant behavior of others may be just as harmful to organizations as the initiation of deviant behavior by an individual employee, the constructs of Machiavellianism and *Compliant Unethical Behavior* (CUB) are applied in this article. CUB occurs as a reaction to a direct request or a more subtle organizational pressure (Wahn, 2003). The two constructs will now be discussed in more detail.

### **Machiavellianism**

Machiavellianism is defined as the tendency of a person to distrust others, to engage in amoral manipulation, to control others, and to strive for status for oneself (Dahling et al., 2009). It is seen as a quantitative trait, which implies that everyone is able to behave in a Machiavellianistic way, but that some act more strongly on it than others (Wilson, Near, & Miller, 1996). Dahling et al. (2009) proposed that Machiavellianism consists of four dimensions, namely, 1) actively distrusting others, 2) the willingness to commit amoral manipulation of others, 3) a desire for controlling others, and 4) the desire for status. Actively distrusting others is defined as “a cynical outlook on the motivations and intentions of others with a concern for the negative implications that those intentions have for the self” (Dahling et al., 2009, p. 227). The dimension of amoral manipulation is defined as “a willingness to disregard standards of morality and see value in behaviors that benefit the self at the expense of others” (Dahling et al., 2009, p. 228). Research shows that highly Machiavellianistic individuals are more manipulative than low Machiavellianistic individuals and are also better at it (Wilson et al., 1996). The desire for control is seen as “a need to exercise dominance over interpersonal situations to minimize the extent to which others have power” (Dahling et al.,

2009, p. 227). The last dimension, which is the desire for status, is defined as “a desire to accumulate external indicators of success” (Dahling et al., 2009, p. 227).

The most common used Machiavellianism measure is the Mach-IV by Christie and Geis (1970; e.g. Paulhus & Williams, 2002; Ashton, Lee, & Son, 2000). However, this method has three limitations: An inconsistent reliability across studies, an ambiguous factor structure, and it consists of items which are double-barreled (Dahling et al., 2009). To overcome these problems Dahling et al. (2009) developed a new measure of Machiavellianism, named the Machiavellian Personality Scale (MPS;  $\alpha = .84$ ). The MPS is a self-report measure of Machiavellianism and has been shown to relate to workplace deviance and to subordinates' job satisfaction. However, as a self-report the MPS is susceptible to socially desirable answers (Stewart et al., 2009). It is expected that a digital work simulation is less susceptible to that problem, since a simulation requires more cognitive knowledge. Consequently social desirable answering is more difficult (Lievens & De Soete, 2012).

### **CUB**

Compliant Unethical Behavior (CUB) in the organizational context is a behavioral response to a direct request or a more subtle (organizational) pressure (Wahn, 2003). It is a reactive attitude toward the work environment (Crant, 2000). Different forms of pressure exist within the organizational environment, such as financial pressure, social pressure, poor work conditions, organizational changes, and unfair treatment (Colbert, Mount, Harter, Witt, & Barrick, 2004). The perceptions of the possible consequences of noncompliant unethical behavior are very important in the process of CUB (Gudjonsson, Sigurdsson, Einarsson, & Einarsson, 2008). These consequences differ for personal and impersonal relationships. In personal relationships (e.g., colleagues), the fear of emotional rejection is particularly important, while this is not the case in impersonal relationships (e.g., strangers and acquaintances). Therefore complying with a manager may occur out of fear of possible negative consequences. This interaction between a manager and a subordinate has been the focus of most studies on CUB (Tepper, 2010). However, Burger, Soroka, Gonzago, Murphy, and Somervell (2001) have found that CUB is also present when the individual has just met the other person. Their explanation for this effect is that feelings of fleeting attraction may lead to CUB, because the principle of reciprocity is well-learned and thus automatically applied.

CUB measurements are currently scarce. Most measures of compliance aim to measure compliance to medical treatments and cannot be applied to a work setting (for

example; Tsang, Fung, & Corrigan, 2006). Wahn (2003) has developed a measure of CUB consisting four items. These items focus on sensitive topics (for example, “done something that you did not believe was right in order to meet the goals set by your boss”) and may therefore be prone to socially desirable answers (Stewart et al., 2009). Another measurement of compliance is created by Gudjonsson (1989), named the Gudjonsson Compliance Scale (GCS). This scale measures a more general form of compliance and is not necessarily related to unethical behavior. The digital work simulation would be an enhanced measurement method to measure CUB, since it is specifically designed to measure CUB.

### **Digital Work Simulations**

Digital work simulations can be defined as computerized replicas of tasks, knowledge, skills, and abilities required in the actual work context (Lievens & De Soete, 2012). These simulations come in different forms; well known examples are situational judgment tests, webcam tests, and serious games (Lievens & De Soete, 2012; Oostrom, Born, Serlie, & Van der Molen, 2010). Most simulations are used to measure skills and performance levels (Lievens & Patterson, 2011). The application of simulations in the selection context is based on the belief that behavior is consistent across situations (Wernimont & Campbell, 1968). Hence the performance on the simulation is representative of actual job performance.

Digital work simulations have their advantages as compared to their paper-and-pencil counterparts. First, the possibility of adding video and audio fragments to the test makes the test more interactive, more realistic, and more immersive (Shute et al., 2009). This enables the participant to be an actual participant instead of being an observer (Mitchell, 2004). Research has also shown that simulations increase the motivation of the participant, since they are preferred by the applicant (Hausknecht et al., 2004). Additionally, simulations are cognitively more demanding, which makes faking difficult as was found by Nguyen, Biderman, and McDaniel (2005). Their results showed that there was less faking on the simulation compared to a Big 5 questionnaire. Furthermore it has been found that simulations have less adverse impact than regular paper-and-pencil tests (Schmitt & Mills, 2001). Of course there are also some disadvantages to digital simulations. Because of the complexity of the simulations, it is often hard to validate the test (Funke, 1998). Furthermore digital simulations are fairly costly to develop compared to their paper-and-pencil counterparts (Lievens & Sackett, 2006). In the studies presented here the validity of the digital work simulation will be examined.

### **Study 1**

The first study aims to establish the construct validity of the digital work simulation that was developed to assess individuals' predispositions to both proactive and reactive workplace deviance (i.e., Machiavellianism and CUB). This will be examined by relating the scores of Machiavellianism and CUB on the digital work simulation to the scores on the MPS (Dahling et al., 2009) and the GCS (Gudjonsson, 1989). In addition it is examined whether this study is able to replicate previously found relationships of the two constructs as measured with the digital work simulation and the Big Five personality traits, Honesty-Humility as measured with a scale of the HEXACO (Lee & Ashton, 2004), and self-esteem (Rosenberg, 1979). Below the theoretical bases for the hypotheses are provided.

The digital work simulation consists of scenes in which the participant plays the role of a sales representative and is confronted with work related events. The scenes relate to different aspects of the job of a sales representative. Participants are instructed to respond to the items in the scenes based on what they would do in that situation. According to the principle of behavioral consistency, these reactions will be a reliable reflection of real work behavior (Wernimont & Campbell, 1968). The items in the digital work simulation which represent Machiavellianism and CUB were based on two existing questionnaires, more specifically the GCS (Gudjonsson, 1989), and the MPS (Dahling et al., 2009). Even though the GCS measures a general form of compliance, it has been used more extensively in previous studies than the 4-item scale of Wahn (Gudjonsson & Sigurdsson, 2003; Gudjonsson et al., 2004). The first hypotheses focus on the relationship between the scores on the digital simulation and the scores on the GCS and the MPS. We hypothesize that:

- H1: Machiavellianism as measured with the digital work simulation will be positively related to Machiavellianism as measured with the MPS.
- H2: CUB as measured with the digital work simulation will be positively related to CUB as measured with the GCS.

In addition, the construct validity will be examined by relating the Machiavellianism and CUB scores on the digital work simulation to personality (i.e., Big Five, Honesty-Humility) and self-esteem. In previous studies a clear link between Machiavellianism and personality has been found (Jakobwitz & Egan, 2006; Lee & Ashton, 2005; Paulhus & Williams, 2002). Machiavellianism has been found to be related to Neuroticism ( $r = .38$ ), Agreeableness ( $r = -.16 - -.47$ ), and Conscientiousness ( $r = -.27 - -.34$ ; Jakobwitz & Egan,

2006; Lee & Ashton, 2005; Paulhus & Williams, 2002). Since highly neurotic individuals are characterized as envious, intrusive, and instable (Goldberg, 1990), Neuroticism and Machiavellianism are positively related. The negative correlation between Machiavellianism and Agreeableness seems logical, considering the conflicting definitions of the two constructs (i.e., amoral manipulation, distrusting and controlling others vs. trustful, fair, and cooperative; Dahling et al., 2009; Goldberg, 1992). Highly conscientious individuals will keep up with any appointment and are moralistic by nature (Goldberg, 1990), while highly Machiavellianistic individuals will only keep up with appointments important to them and bend the rules to attain their goals. Thus, we hypothesize that:

H3: Machiavellianism as measured with the digital work simulation will be positively related to Neuroticism (H3a) and will be negatively related to Agreeableness (H3b) and to Conscientiousness (H3c).

Furthermore a significant negative relationship between Machiavellianism and the sixth factor of personality Honesty-Humility ( $r = -.40 - -.57$ ) has been found (Ashton et al., 2000; Lee & Ashton, 2005). An honest and humble individual is unwilling to exploit others, is sincere, fair, and modest (Ashton, Lee, & Goldberg, 2007; Ashton et al., 2000), which is contradictory to a Machiavellianistic individual who will exploit and manipulate others (Dahling et al., 2009). Therefore it is hypothesized that:

H4: Machiavellianism as measured with the digital work simulation will be negatively related to Honesty-Humility.

CUB has been linked to personality before (Gudjonsson & Sigurdsson, 2003; Gudjonsson et al., 2004). The construct has been found to correlate significantly with Neuroticism ( $r = .36 - .39$ ) and Extraversion ( $r = -.22 - -.31$ ; Gudjonsson et al., 2004). The positive relationship between Neuroticism and CUB seems logical, since a neurotic individual is described as anxious, worrying, and moody (Eysenck & Eysenck, 1975). A highly neurotic individual is more prone to experience emotional stress and may therefore be more prone to exhibit CUB to avoid negative emotions. Introverts are expected to show more CUB as they are reserved and tend to lack assertiveness (Gudjonsson et al., 2004). Hence we hypothesize that:

H5: CUB as measured with the digital work simulation will be positively related to Neuroticism (H5a) and negatively related to Extraversion (H5b).

In several previous studies a link between CUB and self-esteem has been found (Gudjonsson & Sigurdsson, 2003; Gudjonsson, Sigurdsson, Brynjólfssdóttir, & Hreinsdóttir, 2002). Self-esteem can be described as a positive or negative attitude toward the self (Rosenberg, 1979). Since having a low self-esteem is associated with feelings of guilt, an individual with a low self-esteem will be more prone to comply with a request to behave unethically than an individual with a high self-esteem (Gudjonsson et al., 2002). Thus, we hypothesize that:

H6: CUB as measured with the digital work simulation will be negatively related to self-esteem.

## Method

### Participants and Procedure

Participants were approached via the website of a large HRD consultancy firm in the Netherlands and through the network of the researchers (convenience sample). The total sample consisted of 113 participants, 42 were female (37.2%) and 71 were male (62.8%). They had a mean age of 36.48 years ( $SD = 10.92$ ; range 19 to 66) and on average 12.78 years of work experience ( $SD = 10.53$ ; range 0 to 40). 58 of the participants had a university degree (51.3%), 36 had a high vocational degree (31.9%), and 19 participants had another type of degree (16.9%). The sample consisted of participants working in various job sectors; finance (16.8%), ICT (12.4%), healthcare (11.5%), catering industry (9.7%), industry (9.7%), education (8.0%), science and research (8.0%), and other job sectors (24.0%). Because parts of the digital simulation were in English (i.e., simulating a global company), it was ensured that all participants had a good knowledge of the English language. They received an email in which the goal of the study was explained and specific instructions were provided. The instructions described the tests and the total duration. First, the participants participated in the digital work simulation, and also filled out the GCS (Gudjonsson, 1989), the MPS (Dahling et al., 2009), the IPIP (Goldberg, 1992), the adapted Honesty-Humility questionnaire of the HEXACO (Lee & Ashton, 2004), and the Rosenberg Self-Esteem Scale (Rosenberg, 1979). The entire procedure took approximately 45 minutes and a report of the scores was sent to the participants.

## Measures

**Digital work simulation.** The digital work simulation was constructed for the target population of a large Dutch HRD consultancy firm, which mainly consists of highly educated clients that work within a commercial setting. For this reason, participants take on the role of a sales representative when completing the simulation. Constructing the digital work simulation was an iterative process, in which current recommended practice for the development of simulations was followed (e.g., Weekley, Ployhart, & Holtz, 2006).

The first version of the digital work simulation consisted of 30 items, which were adjusted based on the outcome of a pilot study. In total, 69 employees of the HRD consultancy and 30 psychology students contributed to the pilot study. The employees completed the simulation, provided feedback on it (e.g., “Were all instructions clear?”; “Name some positive and negative points of the simulation?”), and were asked to fill out a 16 item questionnaire about the usability of the simulation (e.g., “The lay-out of the simulation and the use of color within the simulation are pleasant and clear.”) The students were given the script of the simulation and were asked to assign the items to the different constructs. Only items that were assigned to the appropriate construct (i.e., the construct for which the item was developed) by more than half of the students remained within the simulation. Based on the results of the pilot study a total of 24 items were chosen. The Machiavellianism was represented by 13 items and CUB was by four items in the digital work simulation. The remaining items were fillers. In addition, a more elaborate introduction of the characters and the company was added.

The final version of the digital work simulation consisted of five scenes in which the participant, playing a sales representative in a global toy-enterprise, is confronted with several work related challenges. Each scene represents a different challenge, regarding the launch of a product, that is relevant for the job of a sales representative. The scenes were constructed by four subject matter experts and contain interactions with supervisors, colleagues, and customers. Participants are instructed to respond to the items based on what he/she would do in a real work setting (e.g., behavioral tendency response format). The characters in the simulation as well as the company and the product are introduced at the beginning of the digital work simulation.

Machiavellianism was assessed by 13 items that are scored on a 4-point Likert-type scale (NO!, no, yes, YES!). The following question is an example of an amorality question: “Now I come to think of it: this could indirectly have consequences for your promotion. I think this is a tough situation, you never know to whom the daughter will show the prototype.

Wouldn't it be better to leave this up to Suzanne? If something goes wrong, then you can't be held responsible." The reliability of Machiavellianism as measured with the digital work simulation (from now on referred to as the Machiavellianism Scale) is  $\alpha = .60$ .

The four CUB items were scored on a 4-point Likert-type scale (NO!, no, yes, YES!). An example of a question is "Annika told me about the boss' request. His daughter wants to have a prototype? I think it's useless to travel back and forth for something like that, so we should just send it to her. I don't see why we should regard this situation differently? You agree with me on that, don't you?" The reliability of CUB as measured with the digital simulation (from now on referred to as the CUB scale) is  $\alpha = .66$ . The reliability coefficients of the Machiavellianism scale and the CUB scale are comparable to reliability coefficients found in prior research on simulations (Christian, Edwards, & Bradley, 2010).

To test the structure of the digital work simulation a series of maximumlikelihood confirmatory factor analyses (CFA) was conducted. Different indices were used to evaluate the fit of the hypothesized two-factor model. Among those indices was the Chi-square test, but since this test is sensitive to sample size it was decided to also look at the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the standardized root mean square residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA) (Jöreskog & Sörbom, 1993). A model fits well to the data if the CFI and TLI values are .95 or higher, the SRMR values are .08 or less, and the RMSEA values are .06 or less (Hu & Bentler, 1999). The hypothesized two-factor model (i.e. Machiavellianism and CUB) provided overall a better fit of the data,  $\chi^2 = 155.92$ ,  $df = 118$ ,  $p = .01$ , CFI = .76, TLI = .72, the SRMR = .09, RMSEA = .05, than the one-factor model ( $\chi^2 = 204.11$ ,  $df = 119$ ,  $p = .00$ , CFI = .45, TLI = .37, the SRMR = .11, RMSEA = .08). Therefore it was decided to maintain the theoretical based two-factor model.

**Self-reported machiavellianism.** For construct validation purposes Machiavellianism was also measured with a self-report measure, the MPS (Dahling et al., 2009). The scale was translated to the Dutch language following the guidelines of the International Test Commission (ITC; Hambleton, 2001). It consists of 16 statements which are answered on a 5-point Likert scale (NO!, no, ?, yes, YES!). An example of a statement of desire for control is "I like to give the orders in interpersonal situations". The MPS was found to have a reliability of  $\alpha = .85$ .

**Self-reported compliance.** Compliance was measured with the GCS (Gudjonsson, 1989). This questionnaire consists of 20 statements which are scored on a 5-point Likert scale (NO!, no, ?, yes, YES!). The statements were translated to the Dutch language following the

ITC guidelines (Hambleton, 2001). One of the statements is: “I give in easily to people when I am pressured”. The reliability of the GCS was  $\alpha = .78$ .

**Personality.** Personality was measured with the 50 item representation of the Goldberg (1992) Big Five markers in the International Personality Item Pool (IPIP; 2001). It was translated to the Dutch language following the ITC guidelines (Hambleton, 2001). It consists of 50 statements which are answered on a 5-point Likert scale (NO!, no, ?, yes, YES!). An example of a statement is “Have frequent mood swings.” The reliabilities of the scales of the IPIP were  $\alpha = .85$  for Extraversion,  $\alpha = .86$  for Neuroticism,  $\alpha = .85$  for Conscientiousness,  $\alpha = .70$  for Agreeableness, and  $\alpha = .74$  for Openness.

**Honesty-humility.** Honesty-Humility was measured with 12 items of the IPIP measuring constructs similar to those included in Lee and Ashton's (2004) HEXACO personality inventory (Appendix I). These items were chosen considering the definition of the four subscales of Honesty-Humility (i.e., sincerity, fairness, greed avoidance, and modesty) and their representativeness of this definition. The items were translated to the Dutch language following the ITC guidelines (Hambleton, 2001). The answers were given on a 5-point Likert scale (NO!, no, ?, yes, YES!) An example of a statement is “Pretend to be concerned for others”. The reliability of the questionnaire was  $\alpha = .65$ .

**Self-esteem.** Self-esteem was measured with the Rosenberg Self-Esteem Scale, which consists of 10 items (Rosenberg, 1979). The items were rated on a 5-point Likert scale (NO!, no, ?, yes, YES!). The items were translated to the Dutch language following the ITC guidelines (Hambleton, 2001). One of the items was “On the whole, I am satisfied with myself”. The reliability of the scale was  $\alpha = .84$ .

## Results

### Descriptive Statistics

The distribution of the study variables was checked. All variables, except for Extraversion and Neuroticism, were normally distributed. Transforming (i.e., log transformations and square root transformations) the two variables was not successful; therefore it was decided to keep the original variable distributions. Means, standard deviations, reliabilities, and correlations between all study variables are provided in Table 1. Before the hypotheses were tested, we looked at significant correlations between demographic characteristics and the other study variables. Age was significantly related to the CUB scale ( $r = -.22, p < .05$ ), the MPS ( $r = -.19, p < .05$ ), the GCS ( $r = -.20, p < .05$ ), and to self-esteem ( $r = .20, p < .05$ ). Gender was significantly related to the score on the Machiavellianism scale ( $r$

= -.20,  $p < .05$ ), the MPS ( $r = -.27, p < .01$ ), Agreeableness ( $r = .24, p < .05$ ), Openness ( $r = -.22, p < .05$ ), and Honesty-Humility ( $r = .21, p < .05$ ), indicating that males tend to be more Machiavellianistic and open, and less agreeable and honest. Education was significantly related to the MPS ( $r = -.20, p < .05$ ). Work experience was significantly related to the CUB scale ( $r = -.26, p < .01$ ), the GCS ( $r = -.22, p < .05$ ), Neuroticism ( $r = -.24, p < .05$ ), and self-esteem ( $r = .30, p < .01$ ).

### **Hypotheses Testing**

As stated in Hypothesis 1, the Machiavellianism scale was positively related to Machiavellianism as measured with the MPS ( $r = .26, p < .01$ ). Hypothesis 2 was also supported, the CUB scale was positively related to CUB as measured with the GCS ( $r = .28, p < .01$ ). The negative relationship between the Machiavellianism and Agreeableness was replicated, supporting Hypothesis 3b ( $r = -.25, p < .01$ ). No significant relationships between the Machiavellianism scale and Neuroticism (H3a;  $r = .02, p = .85$ ) and the Machiavellianism scale and Conscientiousness (H3c;  $r = -.14, p = .14$ ) were found. Hypothesis 4, stating that the Machiavellianism scale would be negatively related to Honesty-Humility, was supported ( $r = -.33, p < .01$ ). A series of stepwise regressions was conducted to determine which variables explain the most variance in the Machiavellianism scale. Honesty-Humility ( $\beta = -.23, t = -3.68, p = .00$ ) is the most important predictor of the Machiavellianism scale and explains 10.9% of its variance ( $F = 13.51, p = .00$ ; Table 2). No other variables showed significant beta weights.

Scores on the CUB scale were positively related to Neuroticism ( $r = .22, p < .05$ ), supporting Hypothesis 5a. The CUB scale was not significantly related to Extraversion ( $r = -.18, p = .06$ ). Therefore Hypothesis 5b was not supported. Self-esteem was, as hypothesized, negatively related to the CUB scale ( $r = -.24, p < .01$ ). A series of stepwise regressions was conducted to determine which variables explain the most variance in the CUB scale. The results of the stepwise regressions show that the GCS score ( $\beta = .36, t = 3.02, p = .00$ ) is the most important predictor of the CUB scale and explains 7.6% of its variance ( $F = 9.12, p = .00$ ; Table 3). No other variables had significant beta weights.

Table 1  
*Descriptive Statistics and Correlations between the Study Variables*

|                           | <i>M</i> | <i>SD</i> | 1     | 2      | 3     | 4      | 5     | 6      | 7      | 8      | 9      | 10     | 11    | 12     | 13     | 14    | 15    | 16    |
|---------------------------|----------|-----------|-------|--------|-------|--------|-------|--------|--------|--------|--------|--------|-------|--------|--------|-------|-------|-------|
| 1. Age                    | 36.48    | 10.92     | (-)   |        |       |        |       |        |        |        |        |        |       |        |        |       |       |       |
| 2. Gender                 | 0.37     | 0.49      | -.14  | (-)    |       |        |       |        |        |        |        |        |       |        |        |       |       |       |
| 3. Education              | 6.14     | 1.25      | .02   | .10    | (-)   |        |       |        |        |        |        |        |       |        |        |       |       |       |
| 4. Work experience        | 12.78    | 10.53     | .92** | -.16   | -.09  | (-)    |       |        |        |        |        |        |       |        |        |       |       |       |
| 5. Computer skills        | 4.25     | 0.88      | -.23* | -.16   | .07   | -.17   | (-)   |        |        |        |        |        |       |        |        |       |       |       |
| 6. Machiavellianism scale | 2.39     | 0.34      | -.12  | -.20*  | -.05  | -.11   | .06   | (.60)  |        |        |        |        |       |        |        |       |       |       |
| 7. CUB scale              | 1.89     | 0.55      | -.22* | .10    | .01   | -.26** | .04   | .08    | (.66)  |        |        |        |       |        |        |       |       |       |
| 8. MPS                    | 2.35     | 0.53      | -.19* | -.27** | -.20* | -.12   | .16   | .26**  | -.14   | (.88)  |        |        |       |        |        |       |       |       |
| 9. GCS                    | 2.64     | 0.42      | -.20* | .03    | -.02  | -.22*  | -.17  | .16    | .28**  | -.01   | (.78)  |        |       |        |        |       |       |       |
| 10. Extraversion          | 3.37     | 0.66      | -.02  | .17    | .07   | -.03   | .09   | -.08   | -.18   | .03    | -.45** | (.85)  |       |        |        |       |       |       |
| 11. Agreeableness         | 4.05     | 0.40      | .04   | .24*   | -.01  | .08    | .01   | -.25** | -.04   | -.35** | -.19*  | .26**  | (.70) |        |        |       |       |       |
| 12. Conscientiousness     | 3.74     | 0.64      | .10   | .16    | -.12  | .16    | -.03  | -.14   | -.19   | .06    | -.26** | .26**  | .36** | (.85)  |        |       |       |       |
| 13. Neuroticism           | 2.35     | 0.66      | -.16  | .07    | .12   | -.24*  | -.11  | .02    | .22*   | -.01   | .44**  | -.34** | -.23* | -.40** | (.86)  |       |       |       |
| 14. Openness              | 3.83     | 0.50      | -.01  | -.22*  | .12   | -.01   | .31** | -.10   | -.05   | .01    | -.37** | .35**  | .25** | .14    | -.21*  | (.74) |       |       |
| 15. Honesty-Humility      | 3.75     | 0.49      | .17   | .21*   | .12   | .16    | -.05  | -.33** | .01    | -.60** | -.19*  | -.01   | .57** | .07    | -.13   | -.01  | (.65) |       |
| 16. Self-esteem           | 4.09     | 0.55      | .20*  | -.01   | -.10  | .30**  | -.05  | -.07   | -.24** | -.11   | -.40** | .38**  | .32** | .51**  | -.73** | .23*  | .21*  | (.84) |

*Note.* Coefficient alphas are presented on the diagonal, between parentheses. CUB scale = compliant unethical behavior scale; MPS = Machiavellianism personality scale; GCS = Gudjonsson compliance scale. Gender is coded as follows: 0 = male, 1 = female. Education is coded as follows: 1 = primary school to 7 = university. All scales range from 1-5, except for the Machiavellianism scale and the CUB scale which range from 1-4.  $N = 113$ .

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

Table 2  
*Stepwise Regression Model Testing Factor Importance in Predicting the Machiavellianism Scale*

|                  | $\beta$ | $t$     | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|------------------|---------|---------|-------|--------------|------------|
| Model 1          |         |         |       |              |            |
| Honesty-Humility | -.33    | -3.68** | .11   | .11          | 13.51**    |

*Note.*  $\beta$  coefficient of the overall model is presented.

\*\*  $p < .01$

Table 3  
*Stepwise Regression Model Testing Factor Importance in Predicting the CUB Scale*

|         | $\beta$ | $t$    | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|---------|---------|--------|-------|--------------|------------|
| Model 1 |         |        |       |              |            |
| GCS     | .28     | 3.02** | .08   | .08          | 9.12**     |

*Note.*  $\beta$  coefficient of the overall model is presented.

\*\*  $p < .01$

### Discussion Study 1

The aim of Study 1 was to examine the construct validity of a digital work simulation intended to measure Machiavellianism and CUB. Even though the size of the correlations is small to medium, the correlations indicate that the digital work simulation is indeed measuring Machiavellianism and CUB. The size of the correlations may be explained by the difference in measurement purpose of the simulation in comparison to both questionnaires. The MPS measures a more trait-like construct in comparison to the digital work simulation which measures behavior (Dahling et al., 2009). Furthermore, the digital work simulation specifically measures compliance with unethical behavior, while the GCS measures a more general form of compliance (Gudjonsson, 1988).

In addition, the study was able to replicate some of the previously found relationships between the constructs measured in the simulation and personality and self-esteem. The Machiavellianism scale was, as expected, related to Agreeableness. This result is consistent with previous research (e.g., Paulhus & Williams, 2002). Moreover, it agrees with the description of Machiavellianistic individuals as individuals who use exploitative tactics and are socially destructive (Paulhus & Williams, 2002; Wilson, Near, & Miller, 1996). Even though no significant relationship between the Machiavellianism scale and Conscientiousness was found, the correlation coefficient was in the expected direction. It is known that Machiavellianistic individuals will first explore their environment and win the trust of their coworkers before they switch to defective and thus rule-breaking behavior (Paulhus & Williams, 2002). The duration of the simulation may affect the amount of non-conscientious behavior that is evoked in the participant. The negative relationship between

Machiavellianism and Honesty-Humility found in previous research was replicated. This result is consistent with Machiavellianism described as the willingness to exploit others, which is contradictory to the reluctance to exploit others of an honest and humble individual (Ashton et al., 2000). Unexpectedly, no relationship between Neuroticism and Machiavellianism was found. This result may be caused by the self-selection effect. Previous research on the self-selection effect found that research volunteers scored on average lower on Neuroticism than non-respondents (Lönnqvist, Paunonen, Verkasalo, Leikas, Tuulio-Hendriksson, & Lönnqvist, 2007).

The CUB scale is indeed negatively related to Neuroticism and self-esteem (Hypotheses 5a and 6). A compliant individual is, as expected, more unstable and has less self-esteem. Although the correlation between CUB and Extraversion was not significant, the size of the correlation was comparable to correlations found in previous simulation research. A meta-analysis of McDaniel, Hartman, Whetzel, and Grubb (2007) found that the mean correlation of Extraversion as tested in a situational judgment test and in a self-report questionnaire was .07. It is plausible that the absence of a real interaction limits the correlation of Extraversion when tested in a simulation. In more interactive simulations, like webcam tests where participants state their own answers instead of selecting a predefined answer, the correlation with Extraversion is higher ( $r = .26, p < .01$ ; Oostrom, Born, Serlie, & Van der Molen, 2011). The first step in the validation of the digital work simulation has been made, but a cross-validation study is necessary for several reasons. First, it is important to examine the stability of the scales of the digital work simulation. Second, the present sample consisted of more men (63.2%), who worked in the financial sector (16.8%), than women. Therefore, it is necessary to conduct a study with a sample that is more balanced. Third, to establish the practical value of the digital work simulation in the assessment context, it is important to look at its incremental validity in the prediction of workplace deviance compared to the self-reported Machiavellianism and compliance (as measured with the MPS and GCS). In addition, it is important to examine whether the digital work simulation is indeed less susceptible to social desirable answering. Since being less susceptible to social desirable answering is an important argument for the use of digital work simulations (Lievens & De Soete, 2012). Therefore, a second study was conducted.

## **Study 2**

The second study aims to shed light on the criterion-related validity of the digital work simulation, by examining its relationship with workplace deviance. Further, the incremental

validity of the simulation, compared to the MPS and the GCS in predicting workplace deviance, is examined. Lastly, the susceptibility of the digital work simulation to social desirable answering is studied. A theoretical base for the hypotheses is provided below.

As described above workplace deviance is defined as voluntary and intentional behavior that harms the organization by violating organizational norms (Robinson & Bennett, 1995). Prior research has demonstrated a link between Machiavellianism and interpersonal deviance (Christie & Geis, 1970; Ricks & Fraedrich, 1999). Ricks and Fraedrich (1999) studied Machiavellianism among sales representatives and concluded that individuals with a high Machiavellianism score are more productive, but are judged less favorable by their managers. Their higher productivity may be explained by their greater focus on financial and personal success (Dahling et al., 2009; Tang & Chen, 2008). The less favorable judgment implicates that high Machiavellianistic individuals function less well in social interactions and thus may be more prone to engage in interpersonal deviance. Previous research conducted by Bennett and Robinson (2000) found a positive relationship between Machiavellianism and organizational deviance, supporting the idea that Machiavellianistic individuals will do anything to attain their goal (Dahling et al., 2009). Therefore we hypothesize that:

H7: The Machiavellianism scale will be positively related to interpersonal deviance (H7a) and organizational deviance (H7b).

A direct link between CUB and workplace deviance has not been researched yet. When considering the definition of CUB (i.e., unethical behavioral response to a request or a more subtle pressure; Wahn, 2003), it seems plausible that the two concepts are related. Since CUB is triggered when pressure is put on the individual, workplace deviance would occur when the individual experiences some kind of pressure (Colbert et al., 2004; Wahn 2003). CUB is mainly motivated by the fear of negative consequences (Treviño, Butterfield, & McCabe, 1998). Noncompliance with a request of a manager may have serious consequences for a person's salary and promotion chances (Grasmick & Kobayashi, 2002). Therefore we hypothesize that:

H8: The CUB scale will be positively related to interpersonal deviance (H8a) and organizational deviance (H8b)

In order to establish the practical value of the digital work simulation it is necessary to establish its incremental validity over self-reports (the MPS and the GCS) in the prediction of workplace deviance. Previous research conducted by Dahling et al., (2009) found a positive relationship between the score on the MPS and workplace deviance. It is expected that the digital work simulation will incrementally predict workplace deviance over and above the MPS, since the simulation focuses on measuring behavior, while the MPS measures a trait-like construct (Dahling et al., 2009). The relationship between the GCS and workplace deviance has not been studied before. It seems plausible that both the GCS and the digital work simulation will predict workplace deviance and that the simulation will incrementally predict workplace deviance over and above the GCS. The digital work simulation specifically focuses on measuring compliant unethical behavior, while the GCS measures a more general form of compliance (Gudjonsson, 1989). Therefore it is hypothesized that:

H9: The Machiavellianism scale will incrementally predict interpersonal deviance (H9a) and organizational deviance (H9b) over and above the MPS.

H10: The CUB scale will incrementally predict interpersonal deviance (H10a) and organizational deviance (H10b) over and above the GCS.

It is a well-known fact that self-report measures of sensitive topics are problematic (Stewart et al., 2009). They are highly susceptible to response biases (e.g. ego-enhancing biases, rationalization). An alternative is using a non-self-report measure, thereby avoiding the response biases of self-reports. But non-self-reports have their restrictions as well, due to restricted observation opportunities of the behavior and a possibility of the fundamental attribution error, which implies that the observer does not take into account the situational influence on behavior (Mount et al., 2006; Stewart et al., 2009). It is expected that the digital work simulation is less susceptible to response biases, more specifically to social desirable answering. Simulations are known to be more cognitively demanding consequently making social desirable answering more difficult (Lievens & De Soete, 2012). Hence, it is hypothesized that:

H11: The Machiavellianism scale (H11a) and the CUB scale (H11b) are less susceptible to socially desirable answering than the MPS and the GCS.

## Method

### Participants and Procedure

The participants were invited via a panel of a Dutch HRD consultancy firm and via a professional panel. The sample consisted of 285 participants of which 116 were female (40.7%) and 169 were male (50.3%). Their age ranged from 17 to 69 years ( $M = 42.62$ ,  $SD = 10.44$ ) and their work experience ranged from 0 to 45 years ( $M = 19.11$ ,  $SD = 10.65$ ). The sample consisted of 174 participants with a higher vocational degree (61.1%), 87 with a university degree (30.5%), and 24 participants with another type of degree (8.4%). The participants worked in a variety of job sectors; healthcare (22.1%), finance (15.8%), ICT (11.9%), education (10.5%), and other job sectors (39.7%).

Participants were invited for the study via email. They participated in the digital work simulation, filled out the GCS (Gudjonsson, 1989), the MPS (Dahling et al., 2009), the Workplace Deviance Questionnaire (WDQ; Bennett & Robinson, 2000), and the short version of the Marlowe-Crowne Social Desirability Scale (MCSDS; Reynolds, 1982). The participants were invited to ask their managers or colleagues whether they would want to complete the non-self-report Workplace Deviance Questionnaire (Stewart et al., 2009). In total 26 managers (40.6%) and 38 colleagues (59.4%) participated. The answers of the managers and colleagues were compared and no significant differences between the two groups were found. Therefore it was decided to analyze them as one group. All participants received a report of their score and its implications.

### Measures

**The digital work simulation.** We retested the structure of the digital work simulation with a series of maximumlikelihood confirmatory factor analyses (CFA). The hypothesized two-factor model (i.e. Machiavellianism and CUB) provided a relative good fit of the data,  $\chi^2 = 112.19$ ,  $df = 89$ ,  $p = .05$ , CFI = .83, TLI = .79, the SRMR = .09, RMSEA = .05 and was a better solution than the one-factor model ( $\Delta\chi^2 = 190.54$ ,  $df = 20$ ,  $p = .00$ ;  $\chi^2 = 302.73$ ,  $df = 119$ ,  $p = .00$ , CFI = .67, TLI = .62, the SRMR = .08, RMSEA = .07). These results confirm the findings of study 1. Furthermore the reliability of the scales was supported (Machiavellianism scale  $\alpha = .64$ ; CUB scale  $\alpha = .63$ ).

**Machiavellianism and compliance.** The same version of the MPS and the GCS was used in this study as in study 1. The reliability of the MPS was  $\alpha = .80$ . The reliability of the GCS was  $\alpha = .85$ .

**Workplace deviance.** To obtain a more complete view of the true workplace deviance of employees, it was decided to use both a self-report measure and an other-report measure.

Self-reports may capture behavior that other reports would miss, but when only self-reports are used the chances of common method bias increase (Mount et al., 2006). Another disadvantage of self-reports is that participants tend to rationalize their own behavior, which influences the reliability of the scale (Stewart et al., 2009). To capture a more objective view on workplace deviance behavior an other-report to measure workplace deviance was administered as well, which was filled out by the manager or a colleague of the participant. Although this way of measuring also has its limitations, like a restricted opportunity to observe behavior and a possible halo bias, by measuring both a more reliable view of workplace deviance is attained (Mount et al., 2006).

The WDS of Bennett and Robinson (2000) was used as a self-report measure of interpersonal deviance as well as organizational deviance. The scale consists of 7 items measuring interpersonal deviance ( $\alpha = .82$ ) and 11 items measuring organizational deviance ( $\alpha = .89$ ). The items were measured on a 5-point Likert scale (1 = *never*, 2 = *once*, 3 = *several times a year*, 4 = *weekly*, 5 = *daily*) consistent with previous research done by Mount et al. (2006). An interpersonal deviance item was: “Made fun of someone at work” and an organizational deviance item was: “Taken property from work without permission”. The items were translated to the Dutch language following the ITC guidelines (Hambleton, 2001).

The other-report workplace deviance scale was filled by the manager or colleague of the participant. This measure of workplace deviance was created by Stewart et al. (2009). It was largely based on the WDS, but the perspectives of the statements were altered and some statements were dropped. The scale is scored on a 5-point Likert scale (1 = *never*, 2 = *once*, 3 = *several times a year*, 4 = *weekly*, 5 = *daily*). The scale consists of 4 interpersonal deviance items (“Played a mean prank on someone at work”) and 8 organizational deviance items (“Took property from work without permission”). The items were translated to the Dutch language following the ITC guidelines (Hambleton, 2001). The reliability of the other-report of interpersonal deviance scale was  $\alpha = .87$  and  $\alpha = .95$  of the other-report of organizational deviance scale.

**Social desirable answering.** The MCSDS is a measure of socially desirable answering (Reynolds, 1982). The short version of the MCSDS used in this study consisted of 13 items. The items have two response options (1 = *true*, 2 = *false*). An example of an item is “No matter who I’m talking to, I’m always a good listener.” The reliability of this scale was  $\alpha = .67$ . The items were translated to the Dutch language following the ITC guidelines (Hambleton, 2001).

## Results

### Descriptive Statistics

Preliminary analysis showed that interpersonal deviance and organizational deviance do not follow a normal distribution. Transforming (i.e., log transformations and square root transformations) the variables did not change the distribution, therefore no transformations were done. The other study variables are normally distributed. Means, standard deviations, reliabilities, and correlations of all study variables are provided in Table 4. Preliminary analysis of the demographic variables and the study variables showed that age was significantly related to the CUB scale ( $r = -.16, p < .01$ ), the MPS ( $r = -.12, p < .05$ ), the GCS ( $r = -.18, p < .01$ ), the other-report interpersonal scale ( $r = .27, p < .05$ ), and to social desirability ( $r = .16, p < .01$ ). Gender was significantly related to the MPS ( $r = -.20, p < .01$ ), the GCS ( $r = .14, p < .05$ ) and the self-report interpersonal deviance scale ( $r = -.24, p < .01$ ), implying that men score higher on Machiavellianism and the self-reported interpersonal deviance scale, but lower on the GCS. Work experience was negatively related to the GCS ( $r = -.17, p < .01$ ), to the other-report interpersonal deviance ( $r = .26, p < .05$ ), and to social desirability ( $r = .14, p < .05$ ). In line with study 1, the Machiavellianism scale was significantly related to the MPS ( $r = .20, p < .01$ ) and the CUB scale was significantly related to the GCS ( $r = .29, p < .01$ ).

### Hypotheses Testing

A significant positive correlation between the Machiavellianism scale and both the self-report interpersonal deviance ( $r = .13, p < .05$ ) and the other-report interpersonal deviance scale ( $r = .31, p < .05$ ) was found, supporting Hypothesis 7a. Hypothesis 7b was supported as well, the Machiavellianism scale was positively related to both the self-report organizational deviance scale ( $r = .21, p < .01$ ) and the other-report organizational deviance scale ( $r = .45, p < .01$ ). The CUB scale was not related to the self-report interpersonal deviance scale ( $r = .08, p = .16$ ) nor to the other-report interpersonal deviance scale ( $r = .19, p = .14$ ), therefore H8a was not supported. Regarding H8b, the CUB scale was not significantly related to the self-report organizational deviance scale ( $r = .08, p = .18$ ) nor to the other-report organizational deviance scale ( $r = .24, p = .06$ ).

A series of hierarchical regression analyses were conducted to examine the incremental validity of the Machiavellianism scale over and above the MPS in predicting interpersonal deviance and organizational deviance, controlling for social desirable answering. First, the results regarding self-reported interpersonal deviance: the Machiavellianism scale ( $\beta = .04, t = .75, p = .46$ ) did not incrementally predict the self-report

interpersonal deviance scale over the MPS ( $\beta = .25, t = 4.51, p = .00$ ). This model explained 26.8% of the variance in the self-report interpersonal deviance scale ( $F = 34.32, p = .00$ ; Table 5). Second, the Machiavellianism scale ( $\beta = .23, t = 1.85, p = .07$ ) did not incrementally predict the other-report interpersonal deviance scale over and above the MPS ( $\beta = .12, t = .89, p = .38$ ). The entire model explained 16.7% of the other-report interpersonal deviance scale ( $F = 4.01, p = .01$ ; Table 6). Hypothesis 9a was not supported. Third, the hierarchical regression analyses showed that the Machiavellianism scale ( $\beta = .15, t = 2.79, p = .00$ ) did incrementally predict the self-report organizational deviance scale over and above the MPS ( $\beta = .09, t = 1.55, p = .12$ ). The entire model explained 25.9% of the variance in the self-report organizational deviance scale ( $F = 32.8, p = .00$ ; Table 7). Fourth, the Machiavellianism scale ( $\beta = .36, t = 3.08, p = .00$ ) incrementally predicted the other-report organizational deviance scale over and above the MPS ( $\beta = .10, t = .80, p = .43$ ). The model predicted 28.3% of the variance in the other report organizational deviance scale ( $F = 7.88, p = .00$ ; Table 8). Thus, hypothesis 9b was supported.

To examine whether the CUB scale had incremental validity over and above the GCS in the prediction of interpersonal deviance and organizational deviance, while controlling for social desirability, a series of hierarchical regression analyses were conducted. The results show that the CUB scale ( $\beta = .04, t = .74, p = .46$ ) does not incrementally predict the self-report interpersonal deviance scale over and above the GCS ( $\beta = -.10, t = -1.72, p = .09$ ). The entire model explained 21.7% of the variance in the self-report interpersonal deviance scale ( $F = 26.01, p = .00$ ; Table 9). In addition, the CUB scale ( $\beta = .13, t = .99, p = .33$ ) did not incrementally predict the other-report interpersonal deviance scale over and above the GCS ( $\beta = -.06, t = -.44, p = .66$ ). The model explained 11.0% of the variance in the other interpersonal deviance scale ( $F = 2.48, p = .07$ ; Table 10). Hence, hypothesis 10a was not supported. Hypothesis 10b was not supported either. The CUB scale ( $\beta = .01, t = .17, p = .86$ ) did not incrementally predict the self-report organizational deviance scale over and above the GCS ( $\beta = -.01, t = -.09, p = .93$ ). The model explained 22.8% of the variance in the self-report organizational deviance scale ( $F = 27.62, p = .00$ ; Table 11). The CUB scale ( $\beta = .14, t = 1.09, p = .28$ ) did not incrementally predict the other-report organizational deviance scale over and above the GCS ( $\beta = .10, t = .78, p = .44$ ). The model explained 17.2% of the variance in the other report organizational deviance scale ( $F = 4.16, p = .01$ ; Table 12).

Table 4  
*Descriptive Statistics and Correlations between the Study Variables*

|                           | <i>M</i> | <i>SD</i> | 1      | 2      | 3    | 4      | 5    | 6     | 7     | 8      | 9      | 10     | 11    | 12     | 13     | 14    |
|---------------------------|----------|-----------|--------|--------|------|--------|------|-------|-------|--------|--------|--------|-------|--------|--------|-------|
| 1. Age                    | 42.62    | 10.44     | (-)    |        |      |        |      |       |       |        |        |        |       |        |        |       |
| 2. Gender                 | .41      | .49       | -.05   | (-)    |      |        |      |       |       |        |        |        |       |        |        |       |
| 3. Education              | 6.15     | .84       | -.10   | .11    | (-)  |        |      |       |       |        |        |        |       |        |        |       |
| 4. Work experience        | 19.11    | 10.65     | .88**  | -.05   | -.09 | (-)    |      |       |       |        |        |        |       |        |        |       |
| 5. Computer skills        | 4.21     | .72       | -.12*  | -.17** | .13* | -.12*  | (-)  |       |       |        |        |        |       |        |        |       |
| 6. Machiavellianism scale | 2.40     | .36       | -.01   | -.05   | -.02 | .06    | .06  | (.64) |       |        |        |        |       |        |        |       |
| 7. CUB scale              | 1.83     | .58       | -.16** | -.03   | .05  | -.11   | -.06 | .42** | (.63) |        |        |        |       |        |        |       |
| 8. MPS                    | 2.47     | .47       | -.12*  | -.20** | -.08 | -.09   | .08  | .20** | .07   | (.80)  |        |        |       |        |        |       |
| 9. GCS                    | 2.56     | .49       | -.18** | .14*   | .07  | -.17** | -.04 | .11   | .29** | .12    | (.85)  |        |       |        |        |       |
| 10. SIDS                  | 1.48     | .48       | -.10   | -.24** | -.10 | -.11   | .04  | .13*  | .08   | .37**  | .03    | (.82)  |       |        |        |       |
| 11. OIDS                  | 1.32     | .56       | .27*   | -.24   | -.03 | .26*   | .14  | .31*  | .19   | .27*   | .10    | .48**  | (.87) |        |        |       |
| 12. SODS                  | 1.47     | .47       | .01    | -.08   | .02  | -.04   | .08  | .21** | .08   | .25**  | .12    | .65**  | .69** | (.89)  |        |       |
| 13. OODS                  | 1.31     | .55       | .13    | -.14   | -.07 | .14    | .20  | .45** | .24   | .30*   | .27*   | .45**  | .85** | .77**  | (.86)  |       |
| 14. Social desirability   | 1.72     | .19       | .16**  | .01    | -.08 | .14*   | .03  | -.11  | -.15* | -.30** | -.25** | -.46** | -.31* | -.48** | -.38** | (.67) |

*Note.* Coefficient alphas are presented on the diagonal, between parentheses. CUB scale = compliant unethical behavior scale; MPS = Machiavellianism personality scale; GCS = Gudjonsson compliance scale; SIDS = self-report interpersonal deviance scale; OIDS = other-report interpersonal deviance scale; SODS = self-report organizational deviance scale; OODS = other-report organizational deviance scale. Gender is coded as follows: 0 = male, 1 = female. Education is coded as follows: 1 = primary school to 7 = university. All scales range from 1-5, except for the Machiavellianism Scale and the CUB Scale which range from 1-4 and the MCSDS which ranged from 1-2. Sample;  $N = 285$ . Managers/colleagues;  $N = 64$ .

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

The MPS ( $r = -.30, p < .01$ ) was significantly related to social desirable answering, while the Machiavellianism scale was not ( $r = -.11, p = .06$ ). The t-statistic of the difference between the two correlations was computed (Chen & Popovich, 2002). The two correlations were significantly different ( $t = -3.74, p < .0$ ). Therefore hypothesis 11a was supported. The GCS ( $r = -.25, p < .01$ ) was significantly related to social desirable answering, as was the CUB scale ( $r = -.15, p < .05$ ). The t-statistic of this difference in correlations was computed as well. The correlations were not significantly different ( $t = -1.46, p > .05$ ) Hypothesis 11 b was therefore not supported.

Table 5  
*Incremental Validity of the Machiavellianism Scale in Predicting Self-Reported Interpersonal Deviance*

|                        | $\beta$ | $t$     | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|------------------------|---------|---------|-------|--------------|------------|
| Step 1                 |         |         |       |              |            |
| Social Desirability    | -.38    | -7.04** | .21   | .21          | 74.73**    |
| Step 2                 |         |         |       |              |            |
| Machiavellianism scale | .04     | .75     | .27   | .06          | 34.32**    |
| MPS                    | .25     | 4.51**  |       |              |            |

Note. Standardized regression weights are for final step.

\*\*  $p < .01$

Table 6  
*Incremental Validity of the Machiavellianism Scale in Predicting Other-Reported Interpersonal Deviance*

|                        | $\beta$ | $t$   | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|------------------------|---------|-------|-------|--------------|------------|
| Step 1                 |         |       |       |              |            |
| Social Desirability    | -.21    | -1.59 | .10   | .10          | 6.49*      |
| Step 2                 |         |       |       |              |            |
| Machiavellianism scale | .23     | 1.85  | .17   | .07          | 4.01*      |
| MPS                    | .12     | .89   |       |              |            |

Note. Standardized regression weights are for final step.

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

Table 7  
*Incremental Validity of the Machiavellianism Scale in Predicting Self-Reported Organizational Deviance*

|                        | $\beta$ | $t$     | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|------------------------|---------|---------|-------|--------------|------------|
| Step 1                 |         |         |       |              |            |
| Social Desirability    | -.44    | -8.06** | .23   | .23          | 83.40**    |
| Step 2                 |         |         |       |              |            |
| Machiavellianism scale | .15     | 2.79**  | .26   | .03          | 32.80**    |
| MPS                    | .09     | 1.55    |       |              |            |

Note. Standardized regression weights are for final step.

\*\*  $p < .01$

Table 7  
*Incremental Validity of the Machiavellianism Scale in Predicting Other-Reported Organizational Deviance*

|                        | $\beta$ | $t$    | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|------------------------|---------|--------|-------|--------------|------------|
| Step 1                 |         |        |       |              |            |
| Social Desirability    | -.25    | -2.10* | .14   | .14          | 10.24**    |
| Step 2                 |         |        |       |              |            |
| Machiavellianism scale | .36     | 3.08** | .28   | .14          | 7.88**     |
| MPS                    | .10     | .80    |       |              |            |

*Note.* Standardized regression weights are for final step.

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

Table 9  
*Incremental Validity of the CUB Scale in Predicting Self-Reported Interpersonal Deviance*

|                     | $\beta$ | $t$     | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|---------------------|---------|---------|-------|--------------|------------|
| Step 1              |         |         |       |              |            |
| Social Desirability | -.48    | -8.69** | .21   | .21          | 74.73**    |
| Step 2              |         |         |       |              |            |
| CUB scale           | .04     | .74     | .22   | .01          | 26.01**    |
| GCS                 | -.10    | -1.72   |       |              |            |

*Note.* Standardized regression weights are for final step.

\*\*  $p < .01$

Table 10  
*Incremental Validity of the CUB Scale in Predicting Other-Reported Interpersonal Deviance*

|                     | $\beta$ | $t$    | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|---------------------|---------|--------|-------|--------------|------------|
| Step 1              |         |        |       |              |            |
| Social Desirability | -.30    | -2.21* | .10   | .10          | 6.49*      |
| Step 2              |         |        |       |              |            |
| CUB scale           | .13     | .99    | .11   | .02          | 2.48       |
| GCS                 | -.06    | -.44   |       |              |            |

*Note.* Standardized regression weights are for final step.

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

Table 11  
*Incremental Validity of the CUB Scale in Predicting Self-Reported Organizational Deviance*

|                     | $\beta$ | $t$     | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|---------------------|---------|---------|-------|--------------|------------|
| Step 1              |         |         |       |              |            |
| Social Desirability | -.48    | -8.79** | .23   | .23          | 83.40**    |
| Step 2              |         |         |       |              |            |
| CUB scale           | .01     | .17     | .23   | .00          | 27.62**    |
| GCS                 | -.01    | -.09    |       |              |            |

*Note.* Standardized regression weights are for final step.

\*\*  $p < .01$

Table 12  
*Incremental Validity of the CUB Scale in Predicting Other-Reported Organizational Deviance*

|                     | $\beta$ | $t$    | $R^2$ | $\Delta R^2$ | $\Delta F$ |
|---------------------|---------|--------|-------|--------------|------------|
| Step 1              |         |        |       |              |            |
| Social Desirability | -.30    | -2.27* | .14   | .14          | 10.24**    |
| Step 2              |         |        |       |              |            |
| CUB scale           | .14     | 1.09   | .17   | .03          | 4.16*      |
| GCS                 | .10     | .78    |       |              |            |

*Note.* Standardized regression weights are for final step.

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

### Discussion Study 2

The purpose of study 2 was to examine the criterion-related validity of the digital work simulation predicting workplace deviance. The results show that the digital work simulation is predicting interpersonal and organizational deviance through the assessment of Machiavellianism and CUB. In addition, the digital work simulation incrementally predicts organizational deviance over and above the MPS and the GCS. Furthermore the digital work simulation is less susceptible to social desirable answering than the MPS. The results will be discussed more elaborately below.

This study was able to replicate the previously found relationship between Machiavellianism and workplace deviance. As stated above, Machiavellianistic individuals are more focused on financial and personal success (Dahling et al., 2009; Tang & Chen, 2008). Machiavellianistic individuals will maximize their own benefit and rather manipulate others than cooperating with them (Gunnthorsdottir, McCabe, & Smith, 2002). Furthermore if necessary they will steal to attain their goal. No relationship was found between CUB and workplace deviance and may be caused by the process of moral disengagement, more specifically by the displacement of responsibility (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). Following the notion of moral disengagement, when complying with an unethical request, the individual may displace their responsibility to the request maker, thereby judging one's own actions as legitimate and not as deviant. Further, Machiavellianism as measured with the digital work simulation was able to incrementally predict organizational deviance over and above the MPS, but not incrementally predict interpersonal deviance. Wilson et al., (1996) pointed out that Machiavellianistic individuals cannot attain their goals through manipulation and defection alone, sometimes cooperation is necessary. In the digital work simulation the individual needs to attain a clear goal, namely achieving a successful product launch. In order to achieve that goal the individual may feel the need to cooperate and

thereby act less Machiavellianistic in the digital work simulation in comparison to completing the MPS. Moreover, the results indicate that the digital work simulation is less susceptible to social desirable answering than the MPS. This result supports research done by Nguyen et al., (2005) who found that simulations are less susceptible to social desirable answering compared to personality questionnaires. Concluding remarks, limitations and research suggestions are discussed below.

### **General Discussion**

The purpose of the present studies was to validate a digital work simulation. In sum, the results of the studies showed that a digital work simulation is able to measure Machiavellianism and CUB, hereby predicting workplace deviance. A digital work simulation provides practitioners with an alternative measure of workplace deviance, Machiavellianism, and CUB. In addition the digital work simulation has been shown to be less susceptible to social desirable answering than existing questionnaires.

Although we urge for replicating the study in other cultural settings, we believe that our study results are also relevant for other countries. Since workplace deviance is a problem in organizations worldwide (Ones, 2002), a reliable prediction of workplace deviance is valuable. In the current study the participants were asked to invite a manager or colleague to complete the other ratings of workplace deviance. We received other ratings of only 22.5% of the participants, given the research topic it is plausible that the other ratings are biased due to several reasons. First, it is likely that participants have asked managers or colleagues which they liked. Likeability causes ratings to be biased through the halo effect, resulting in a more positive rating of the participant (Tsui & Barry, 1986). Second, since participation in the studies was voluntarily a self-selection effect may have occurred, causing deviant individuals (i.e., highly Machiavellianistic individuals) to drop out. Machiavellianistic individuals tend to score low on Agreeableness and Conscientiousness, and tend to score high on Neuroticism (Jakobwitz & Egan, 2006; Lee & Ashton, 2005; Paulhus & Williams, 2002). Previous research on research volunteers has shown that respondents score higher on Agreeableness, Conscientiousness, and Extraversion and lower on Neuroticism compared to non-respondents (Lönqvist et al., 2007). Therefore, we urge replication in an organizational setting, where participants are obligated to participate to avoid the self-selection effect.

Even though a digital work simulation has its advantages over more conventional measurement methods of workplace deviance, some aspects of it are still in need of more research. A particularly interesting aspect to look at is the duration of the simulation. It is

known that Machiavellianistic individuals will first explore their surroundings before displaying defective strategies (Paulhus & Williams, 2002). Therefore it may be interesting to create a digital work simulation which takes longer to complete than the current one.

This article provides results on the first digital work simulation predicting workplace deviance by measuring Machiavellianism and CUB. The digital work simulation was less susceptible to social desirable answering; supporting the notion that a digital work simulation is a good alternative in the measurement of deviant workplace behavior. Furthermore the results provided support for the incremental validity of digital work simulations in predicting deviant behavior over and above existing questionnaires.

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## **Appendix I**

### **Adapted Honesty-Humility Scale**

1. Pretend to be concerned for others.
2. Don't pretend to be more than I am.
3. Tell other people what they want to hear so that they will do what I want them to do.
4. Cheat to get ahead.
5. Would never cheat on my taxes.
6. Would feel very badly for a long time if I were to steal from someone.
7. Love luxury.
8. Have a strong need for power.
9. Am out for my own personal gain.
10. See myself as an average person.
11. Am more capable than most others.
12. Like to attract attention.