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# The relationship between self-report and indirect measures of values : is social desirability a significant moderator?

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24

**Abstract**

25 **Introduction.** La mesure des valeurs personnelles demeure un grand défi en  
26 psychologie sociale en raison de la nature complexe de ce concept. **Objectif.** Basée  
27 sur la théorie des valeurs humaines de Schwartz, cette étude visait à analyser la  
28 relation entre le test des associations implicites de valeurs (VIAT), une mesure  
29 indirecte relativement nouvelle des valeurs, et le Questionnaire des valeurs du  
30 portrait (PVQ), une mesure directe des valeurs connue. De plus, elle a examiné si la  
31 désirabilité sociale modère cette relation. **Méthode.** Soixante-treize participants  
32 (64,4 % de femmes ; âge moyen = 25,46, écart-type = 4,04) ont participé à l'étude  
33 dans un cadre standardisé. **Résultats.** Les résultats ont montré des priorités de valeur  
34 différentes en fonction de la mesure utilisée (c'est-à-dire indirecte ou directe) et, bien  
35 que la désirabilité sociale ait été davantage liée aux réponses des participants au  
36 PVQ qu'au VIAT, elle n'a pas atténué l'association entre les mesures directes et  
37 indirectes pour aucune des valeurs examinées. **Conclusions.** Les implications des  
38 résultats pour la mesure de la valeur et les développements futurs sont discutées.

39

40 Mots-clés : valeurs, test d'association implicite des valeurs, mesures d'auto-  
41 évaluation, mesures indirectes, désirabilité sociale.

42

## 43 **1. Introduction**

44 Values are desirable and trans-situational goals that serve as guiding  
45 principles in people's life (Schwartz, 1992). Schwartz (1992) theorized ten  
46 motivationally distinct value types (i.e., universalism, benevolence, conformity,  
47 tradition, security, power, achievement, hedonism, stimulation, and self-direction)  
48 located in a circular structure: values characterized by similar motivational goals  
49 appear next to each other, while those with different motivational goals are in  
50 opposite positions. Values are also organized along two bipolar dimensions. The first  
51 dimension contrasts openness to change (hedonism, stimulation and self-direction),  
52 characterized by emphasis on change and independence, and conservation (tradition,  
53 conformity and security), which is instead self-restraint, preserving traditional  
54 practices, and safeguarding stability. The second dimension contrasts self-  
55 enhancement (power and achievement), where people prioritize their personal  
56 interests at the expense of others, and self-transcendence (benevolence and  
57 universalism), where people transcend selfish concerns to promote the welfare of  
58 others.

59 Since values predict human behaviour in different life situations, how they  
60 are measured becomes extremely relevant. However, the topic of value assessment is  
61 an open issue in social psychology. Self-report measures are valid and reliable tools,  
62 able to represent subjective motivational goals, but they are lengthy (Roccas, Sagiv,  
63 & Navon, 2017), and possibly characterized by some specific features, such as for  
64 example self-presentation strategies and introspective limitations. Among these, we  
65 here focused on socially desirable responding, which reflects participants' tendency  
66 to respond in a way to gain approval from others or avoiding disapproval (Paulhus,  
67 2002).

68           Indeed, responses on value scales may partially reflect the respondent's  
69 tendency to give answers that are considered as socially desirable and that make  
70 him/her look good. Values are desirable goals (Schwartz, 1992), this likely making  
71 their assessment particularly vulnerable to social desirability. Social desirability  
72 should be intrinsic to values measurement (Schwartz, Verkasalo, Antonovsky, &  
73 Sagiv, 1997) and therefore according to some authors needs to be controlled for  
74 (e.g., Guerra, Gouveia, Sousa, Lima, & Freires, 2012).

75           Differently, an indirect measure of values could be a useful tool to integrate  
76 the results from self-report measures considering the influence of socially desirable  
77 responding. Indirect measures aim at inferring participants' implicit preferences  
78 considering their performance on an experimental paradigm (Gawronski, 2009).  
79 Indirect measures are computer-based tasks that rely on participants' reaction times  
80 (RT) to specific stimuli rather than on their self-reported answers, thus reducing their  
81 possibility to use their self-presentation strategies.

82           The Implicit Association Test (IAT) (Greenwald, McGhee, & Schwartz,  
83 1998) is a well-known indirect measure used to assess several psychological  
84 constructs (e.g., prejudice, self-esteem). It is a computer-based task that assesses the  
85 strength of association in memory between a target concept (e.g., White and Black  
86 persons) and an attribute dimension (e.g., positive and negative), by asking  
87 participants to categorize a stimulus (e.g., Black face) as quickly and accurately as  
88 possible into one of two target categories or two attributes. The stimuli appear one  
89 by one and may only belong to one out of four target categories. In a first combined  
90 block, the two target categories (e.g., Black and White persons) and the two  
91 attributes (e.g., positive and negative) are associated in a specific way (e.g., White-  
92 positive vs. Black-negative), whereas in a second combined block, the pattern is

93 switched (e.g., White-negative vs. Black-positive). The implicit association of the  
94 respondent can be obtained by computing the difference between the mean latencies  
95 of the first and the second combined block. In this case, shorter reaction times (RT)  
96 and less errors in the first combined block compared to the second combined block  
97 are considered as a preference for White people over Black.

98         Scholars believe indirect measures to provide information which is not  
99 directly available by using direct measures or may be partially different. However, in  
100 a variety of domains, direct and indirect measures show diverse patterns of relations:  
101 they range from being highly correlated (e.g., Banse, Seise, & Zerbes, 2001) to be  
102 completely unrelated, supporting instead the view that implicit and explicit attitudes  
103 are independent (e.g., Karpinski & Hilton, 2001). Recently, it has been largely  
104 theoretically (e.g., Gawronski & Bodenhausen, 2006) and empirically (e.g., Dentale,  
105 Vecchione, Gebauer, & Barbaranelli, 2017; Nosek & Smyth, 2007) claimed that  
106 direct and indirect (self-report) measures assess distinct, but related constructs.  
107 Indeed, their joint use can be extremely informative as they allow researchers to tap  
108 a slightly different aspect of reality (Nosek, Hawkins, & Frazier, 2011). Meta-  
109 analyses have shown that the average degree of convergence between the IAT and  
110 self-report measures is around  $r = .21$  (Greenwald, Poehlman, Uhlmann, & Banaji,  
111 2009) and  $r = .24$  (Hofmann, Gawronski, Gschwendner, & Schmitt, 2005).  
112 Differences between measures may be partially explained by social desirability bias  
113 (e.g., Anderson, 2017).

114         So far, few studies have tried to use the IAT to measure values (Dentale et  
115 al., 2017; Souchon, Maio, Hanel, & Bardin, 2017). The IAT was used according to  
116 Schwartz's theory (1992) to measure the relative importance of a value (e.g., power)  
117 compared to the one showing opposite motivational connotation (e.g., universalism);

118 the importance (importance vs. unimportance) dimension replaces here the  
119 evaluative one (positive vs. negative). Indeed, it is the relative importance the  
120 respondent assigns to each value that needs to be measured. In this case, shorter RT  
121 and less errors in the block where power is associated to importance compared to the  
122 block where power is associated to unimportance show the respondents' greater  
123 association to this value to importance compared to universalism.

124       Research dealing with implicit personal values highlighted interesting results;  
125 first of all, Dentale and colleagues (2017) showed a different value hierarchy  
126 depending on the instrument used. When using self-reports, respondents rated  
127 benevolence, universalism, self-direction, and stimulation as more important than  
128 achievement, power, security and tradition. When using indirect measures, results  
129 showed greater importance ascribed to power and achievement compared to  
130 universalism and benevolence; the value hierarchy was therefore somehow different  
131 based on the measure used. In contrast, Souchon and colleagues (2017) found in  
132 their study an implicit importance associated to universalism over power (Study 5).  
133 Second, Dentale and colleagues (2017) also found low to moderate correlations  
134 between indirect and direct measures of values. This study was moreover the only  
135 one addressing the role of social desirability, and this was done by instructing  
136 participants to appear as good as possible when re-answering the direct value  
137 measure. Authors (Dentale et al., 2017) found correlations between implicit values  
138 and actual behaviours expressing benevolence values in a lab setting (measured in  
139 terms of fictitious money distribution to share between the participant him/herself  
140 and an alternative recipient by using a modified version of the Dictator Game);  
141 indeed, the indirect measure was related to the actual behaviour and not to self-  
142 reports of behaviours. The direct measure was related instead to the self-reported

143 behaviour and not to the actual one, and when controlling for social desirability the  
144 correlations between the self-report measures decreased.

145 Social desirability is however a construct characterized by a long research  
146 tradition, which supports its multidimensional nature. Paulhus (2002) emphasized  
147 the existence of two distinct dimensions of socially desirable responding, which are  
148 self-deceptive enhancement (SDE) and impression management (IM) (Bobbio &  
149 Manganelli, 2011). SDE is the participants' unconscious tendency to provide honest  
150 but positively biased responses to protect self-esteem, whereas IM is a conscious  
151 representation of a positive public image.

## 152 **2. The Present Study**

153 The principle aim of this study was to analyse the role of socially desirable  
154 responding, i.e., SDE and IM, in explicit and implicit values. Specifically, the aim  
155 was twofold:

156 1) Analysing the pattern of means of the Values IATs (VIATs) (one  
157 measuring Power vs. Universalism and one Achievement vs. Benevolence) and of  
158 the self-report values and the correlations between them. Based on the available  
159 literature, we expected a different value hierarchy depending on the measure used  
160 (H1), with universalism and benevolence values rated as more important than power  
161 and achievement when using self-reports compared to when using indirect measures,  
162 and the association between the two measures to be far from perfect (H2).

163 2) Analysing the association between the VIATs and social desirability and  
164 exploring its role in shaping the link between direct and indirect measures. We  
165 expected the IAT to be associated to social desirability to a lesser extent (H3)  
166 compared to self-report values, which were expected to be more deeply influenced  
167 by this bias (H4). Social desirability (both SDE and IM) was expected to moderate



168 the association between measures. At high levels of social desirability, the degree of  
169 correspondence between measures was expected to be lower since this may influence  
170 the self-report measure to a greater extent than the indirect one (H5). Although the  
171 literature on the moderating role of social desirability on the relationship between  
172 indirect and direct measures is not fully consistent (see for example Anderson, 2017;  
173 Egloff & Schmukle, 2003), the main hypothesis is that the implicit-explicit relations  
174 may be weaker at high levels of socially desirable responding.

## 175 **2.1. Method**

### 176 **2.1.1. Participants and Procedure**

177 Seventy-three (64.4% female) participants aged between 20 and 41 years ( $M$   
178  $= 25.46$ ,  $SD = 4.04$ ) were involved in the present study. Regarding participants'  
179 education level, 37.5% had completed secondary school. 22.2% of participants had  
180 completed an undergraduate degree, whereas 27.8% had a master's degree; 12.5%  
181 had a Ph.D. or a second-level professional master. Most participants were students  
182 (67.2%), while others were part time (4.1%) or full time (16.4%) workers. A small  
183 percentage was looking for employment (2.7%), while some rated "other" (9.6%) as  
184 a response.

185 Participants were recruited on a voluntary basis and individually completed  
186 the study in a standardized setting, at the presence of a research team member. We  
187 presented a task on a MacBook laptop computer with a 12 inches' screen and  
188 participants seated approximately 40 centimetres from the monitor. At the beginning  
189 of the experimental session, we asked participants to sign an informed consent and  
190 we told them the study aimed at investigating their opinion on different issues and to  
191 participate in different computer tasks. The procedure lasted approximately 30  
192 minutes; the indirect measures always preceded the self-report questionnaire, based

193 both on Bosson and colleagues' (2000) claiming that "preceding the implicit  
194 measures with the explicit ones brings implicit tasks under greater conscious  
195 control" (p. 641) and on Hoffman and colleagues (2005) who showed that the order  
196 of implicit and explicit measurement does not produce a significant effect on  
197 implicit-explicit correlation. The presentation order of the VIATs and of the  
198 combined pairing (see the Measures section) was counterbalanced. For the IATs,  
199 Inquisit 5 Lab software was used. After completing all the tasks, participants were  
200 individually debriefed about the real aim of the study.

201         The research was approved by [masked for review] and followed the APA  
202 ethical guidelines for research. The main investigator of this study had previously  
203 completed the National Institute for Health training course "Protecting Human  
204 Research Participants" (Certification Number: masked for review).

### 205         **2.1.2. Measures**

206         *Implicit Values.* We used the adapted version of the Values Implicit  
207 Association Tests (VIAT) proposed by Souchon and colleagues (2017), composed of  
208 two tests: the Power vs. Universalism IAT (PU IAT) and the Achievement vs.  
209 Benevolence IAT (AB IAT). The IAT was composed of 7 blocks. The stimuli of the  
210 VIATs aimed at assessing the relative importance of power over universalism and of  
211 achievement over benevolence were translated into Italian from the French original  
212 instrument (see Souchon et al., 2017). The D score for the two VIATs was calculated  
213 according to the improved score algorithm (Greenwald, Nosek, & Banaji, 2003). The  
214 final D score was computed by calculating the difference between the mean latencies  
215 of the two combined blocks, divided by the inclusive standard deviations of response  
216 latencies of the two combined blocks. IATs scores range from -2 (importance and  
217 universalism/benevolence as strongly associated in memory) to +2 (importance and

218 power/achievement as strongly associated in memory). A score of zero indicates  
219 instead that the respondent is equally fast at classifying the stimuli words in the first  
220 (e.g., power or important vs. universalism or unimportant) and in the second (e.g.,  
221 power or unimportant vs. universalism or important) combined blocks. In sum, to  
222 make the correlation results clearer, with an IAT positive score, importance was  
223 associated to power (or achievement), whereas an IAT negative score implied that  
224 importance was associated to universalism (or benevolence).

225         The internal consistency of the two VIATs was calculated with the  
226 Spearman-Brown corrected split-half reliability coefficient, based on two partial D  
227 scores calculated on blocks 3-6 and 4-7 respectively (Schnabel, Asendorpf, &  
228 Greenwald, 2008). Both IATs showed good levels of reliability: .91 for Power vs.  
229 Universalism IAT, .81 for Achievement vs. Benevolence IAT.

230         *Self-report Values.* We used the short version of the Portrait Values  
231 Questionnaire (PVQ-21; Schwartz, 2003) composed of 21 verbal portraits of a  
232 person and his/her objectives or aspirations, which reflect the importance of a value.  
233 For example, “It is important to him/her to be rich. He/she wants to have a lot of  
234 money and expensive things” describes a person for whom power is important.  
235 Respondents' values were inferred from their self-reported similarity (from 1 = not  
236 like me at all to 6 = very much like me) to people described. The four dimensions  
237 considered showed different levels of internal consistency (power:  $\alpha = .59$ ;  
238 universalism:  $\alpha = .52$ ; achievement:  $\alpha = .79$ ; benevolence:  $\alpha = .70$ )<sup>1</sup>.

239         *Social desirability:* We used the short version of the Paulhus' Balanced  
240 Inventory of Desirable Responding (BIDR 6) validated in Italian by Bobbio and

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<sup>1</sup> The low internal consistency of the self-report measures of values may be linked to the version of the scale used, the PVQ-21 (Schwartz, 2003). According to Schwartz (2003), the items were selected to cover the different conceptual components of the value (e.g., the power items tap both wealth and authority). Additionally, each of these indexes is based on only two to three items.

241 Manganelli (2011). The scale is a 16-item measure that assesses Self-deceptive  
242 Enhancement (SDE; positively biased responses that respondents believe to be true.  
243 Item example: “My first impressions of people usually turn out to be right”) and  
244 Impression Management (IM; conscious dissimulation of test responses designed to  
245 create a favourable impression in some audience. Item example: “I always obey  
246 laws, even if I’m unlikely to get caught”). Good internal consistency was found for  
247 both dimensions, SDE:  $\alpha=.75$ , IM:  $\alpha=.67$ .

## 248 **2.2. Data analysis**

249 *Direct-indirect measure relationships.* Bivariate Pearson correlations  
250 between direct and indirect measures were calculated.

251 *The moderating role of social desirability.* To examine whether and the  
252 extent to which social desirability, conceptualized as SDE and IM, moderated the  
253 relationships between implicit and explicit measures of values, we conducted  
254 hierarchical regression analysis with implicit values, social desirability and their  
255 interaction as predictors and explicit values as criterion. Specifically, we tested four  
256 regression models (both for PU IAT and for AB IAT) separately considering SDE  
257 and IM.

## 258 **3. Results**

259 Three Value IATs completed by the respondents (one PU IAT and two AB  
260 IATs) were excluded from the analyses because of too many errors done by the  
261 participants when completing the task (more than 20% of errors; see Souchon et al.,  
262 2017).

263 Table 1 shows the implicit values D scores, the explicit values assessed  
264 through PVQ and the correlation between the variables. Based on values of the D  
265 score, respondents did not show a stronger association to one value over the other; a

266 score around 0 indicates the absence of an association between categories (e.g.,  
267 power and importance). For the PVQ, each respondents' value ratings were centred  
268 around his/her mean to control for individual bias in the use of response scale  
269 (Schwartz, 1992, 2003). Benevolence showed the highest score, followed by  
270 universalism and then by achievement. Power was at the bottom of the value  
271 hierarchy.

272

273

Table 1 about here

274

275

276 *Direct-Indirect Measures Relationships.* We found a positive correlation between the  
277 PU IAT and self-report power values and a negative correlation between the PU IAT  
278 and universalism. The AB IAT was related to self-report achievement values, but the  
279 association between this IAT and self-report benevolence was not statistically  
280 significant. It is also worth noting that a statistically significant correlation between  
281 the AB IAT respectively in positive and negative direction with power and  
282 universalism values was found.

283 *The Role of Social Desirability.* Respondents showed a medium level in both  
284 dimensions of socially desirable responding. In Table 2 means, standard deviations,  
285 and ranges for social desirability and Pearson correlations with self-report values and  
286 VIATs are presented.

287

288

Table 2 about here

289

290

291 No statistically significant correlation was found between indirect measures

292 of values and social desirability, whereas several significant statistical correlations

293 were found with direct measures, but only regarding IM. Specifically, IM was  
294 positively related to universalism and benevolence, whereas it was negatively related  
295 to power and achievement.

296 Finally, we carried out the moderation analysis, whose results are presented  
297 in Table 3 (considering PU IAT) and in Table 4 (considering AB IAT). No  
298 moderation effect of SDE nor IM on the relation between indirect and direct  
299 measures of values was found.

300

301 Table 3 and Table 4 about here

#### 302 **4. Discussion and Conclusions**

303 The main aim of this study was to investigate the relations between a direct  
304 and indirect measure of values, and to examine whether and the extent to which  
305 social desirability, conceptualized as self-deceptive enhancement (SDE) and  
306 impression management (IM), moderates these relations. Indeed, it has been widely  
307 recognized that the joint use of direct and indirect measures of the same construct  
308 may be extremely informative (see Nosek et al., 2011). This is highly relevant since  
309 direct measures of values may be extensively affected by social desirability (Egloff  
310 & Schmukle, 2003).

311 Researchers interested in values assessment highlighted the possibility to use  
312 indirect measures of values (Dentale et al., 2017; Souchon et al., 2017), and all  
313 chose, among different indirect measures, the Implicit Association Test (IAT;  
314 Greenwald et al., 1998). In line with these works, we used two Values IATs adapted  
315 to assess the importance ascribed to the values of power vs. universalism (PU IAT)  
316 and of achievement vs. benevolence (AB IAT). Specifically, we considered their

317 relations with self-report measure (PVQ) aimed at assessing the same construct and  
318 the potential role of social desirability in moderating these relationships.

319 From our results, the PU IAT and the AB IAT were found to be significantly  
320 correlated in positive direction. This is interesting from a theoretical point of view,  
321 since it is consistent with Schwartz's (1992) circular model; indeed, power and  
322 achievement values are adjacent in the motivational circle and share similar  
323 motivational content, this also in line with Dentale and colleagues' (2017) results.

324 When self-reporting their values respondents rated benevolence as the most  
325 important guiding principle in their lives, whereas this was not found using the  
326 VIATs. This result was in contrast with the value hierarchy found through self-report  
327 measures, where benevolence was the most important value and power was the least  
328 important one. This result is in line with our first hypothesis (H1) and with previous  
329 studies on this topic (e.g., Dentale et al., 2017), according to which it is possible to  
330 find different values hierarchies depending on the method of assessment used (self-  
331 report vs. indirect measures). This degree of implicit-explicit dissociation suggests  
332 two important considerations. First, responding biases can influence more one kind  
333 of measure and less the other. Second, self-report and indirect measures tap different  
334 but related constructs (Nosek et al., 2011).

335 To better understand the existing relation between direct and indirect  
336 measures the available literature on the topic mainly relies on correlational analyses  
337 (Hofmann et al., 2005). In line with this, we found a significant, although moderate  
338 correlation between the PU IAT and power and universalism assessed through the  
339 self-report measure. When the AB IAT was instead considered, the correlation was  
340 significant only between importance associated to achievement at implicit and  
341 explicit achievement. The existing positive and negative correlations between AB

342 IAT and power and universalism reflect the motivational similarity among the values  
343 which belong to the self-transcendence domain (universalism and benevolence) on  
344 the one hand, and those which pertain instead to self-enhancement (power and  
345 achievement). Indeed, an automatic importance associated to achievement appears to  
346 be related to a coherent - in terms of motivational content- self-reported value, that is  
347 power. The same applies - in a negative direction - for self-reported universalism.

348         The literature dealing with the direct-indirect measures association  
349 emphasizes the possibility of different patterns of relations and the interpretation of  
350 these relationships is still far from being fully understood (Hofmann et al., 2005).  
351 This variety of patterns of relations may be due to different reasons, among which,  
352 biases such as social desirability, introspection, or motivation to control the  
353 responses, that tend to influence self-report measures (and less direct ones).  
354 According to the APE model (associative – propositional evaluative model;  
355 Gawronski & Bodenhausen, 2006), the automatic evaluation is outside awareness  
356 and, at the explicit level, other components (of which social desirability is only one)  
357 may be relevant to consider. Also, method-related factors can influence the  
358 correlation between the two measures; the degree of correspondence in terms of  
359 similarity between the two measures can increase the size of their correlation  
360 (Hofmann et al., 2005). More interestingly, direct and indirect measures have been  
361 also considered as measuring independent representations; low correlations between  
362 measures may be considered as a proof of implicit-explicit dissociation, suggesting  
363 again that indirect and direct measures assess distinct, but related constructs (e.g.,  
364 Nosek et al., 2011). Some authors claim that the correlation between direct and  
365 indirect measures (in our case, of values) may be considered as an ambiguous piece  
366 of information (Perugini, 2005); indeed, we carried out a more complex model to



367 study the relation among measures. However, based on the scarce available literature  
368 dealing with indirect measures of values, we can share Dentale and colleagues'  
369 (2017) point of view, who claim that an IAT used to measure values allow  
370 researchers to capture something which is unique.

371         The role of social desirability in its multidimensional aspects in shaping  
372 values responding and the relationship between direct and indirect measures of  
373 values were investigated in this study. In line with our third (H3) and fourth (H4)  
374 hypothesis, social desirability was related to a greater extent to self-report measures  
375 compared to the indirect ones. Only IM was related to values, being negatively  
376 related to power and achievement and positively to universalism and benevolence,  
377 that are those values on the top of the value hierarchy found through self-reports. In  
378 order to be viewed more favourably, respondents rated as important those values  
379 characterized by a focus on others (universalism and benevolence) and not those by a  
380 personal focus (power and achievement).

381         More interestingly, no relation was found between social desirability and the  
382 indirect measures of values. It would be interesting to find out whether these  
383 measures are not only less associated to social desirability bias, but are, in general,  
384 more immune to faking; some authors, based on their empirical findings, claim in  
385 fact some limits of indirect measures in terms of invulnerability to faking (e.g.,  
386 Steffens, 2004).

387         The present study also aimed at considering participants' social desirability  
388 as a possible moderator in influencing the relation between direct and indirect  
389 measures of values. However, contrary to our hypothesis (H5) we found no  
390 moderation effect, neither of SDE nor of IM. The moderating role of social  
391 desirability between direct and indirect measures of the same construct has been

392 often theoretically claimed but seldom empirically investigated. Other researchers  
393 dealing with this issue did not find any effect (Egloff & Schmukle, 2003); Anderson  
394 (2017) instead recently found that at high level of IM the correspondence between  
395 implicit and explicit attitude towards asylum seeker in Australia become weaker, this  
396 being in line with the most common assumptions on the direct-indirect measures  
397 relations.

398         Based on our results and on the above-mentioned literature, we could claim  
399 that social desirability is not “enough”: it could be a complex interplay of cognitive  
400 and motivational factors that cannot be reduced to the social desirability bias what  
401 really moderates this relation. Consistently, Gawronski and colleagues (2007)  
402 emphasized how social desirability by itself may be too general, since it does not  
403 allow a firm prediction about the direction of the distortion. Other dimensions  
404 together with social desirability should be taken into consideration: It is likely that  
405 the overt motivation to control one’s own responses could be one of these factors.

406         This study is not without limitations. First, the sample is small, and the lack  
407 of a significant moderation effect may also be due to this. Second, caution is needed  
408 when interpreting the results linked to the values dimensions which showed low  
409 reliability (e.g., self-report power and universalism). Third, the indirect measure  
410 assesses the relative importance of a value (e.g., power) compared to the one  
411 showing opposite motivational connotation (e.g., universalism), whereas the direct  
412 measure by independently assessing the importance of each value finally creates a  
413 ranking among the different values. The different nature of the two measures might  
414 influence their association, thus the association between measures can be  
415 reconducted to specific methodological issues associated with the measurement of  
416 the constructs. Fourth, given the complexity of the VIAT task as compared to

417 traditional IAT the study was conducted in laboratory. However, adopting an online-  
418 based approach to administer the instruments could allow researchers to investigate  
419 whether and the extent to which the “context of administration” influences the levels  
420 of socially desirable responding and its role as moderator.

421 Despite of these limitations, the present work, together with the recent works  
422 on this topic (i.e., Dentale et al., 2017; Souchon et al., 2017) proposes an alternative  
423 method of measurement of human values, this being an important step towards a full  
424 comprehension of value assessment. Researchers interested in a method of  
425 measurement of values less likely to be influenced by social desirability may  
426 consider the possibility of using the VIAT.

427 There are several research fields where this method can be applied. A  
428 development of this present research may lay in the study of value transmission  
429 across generations, which plays a relevant role in the development of the individual  
430 and in the functioning of the wider society (Barni, Alfieri, Marta, & Rosnati, 2013;  
431 Barni, Ranieri, Ferrari, Danioni, & Rosnati, 2016). Research on this topic has  
432 highlighted that parent-child value similarity, which is considered the outcome of  
433 intergenerational transmission of values, may be partly influenced by the  
434 predominant value climate experienced by both generations because belonging to the  
435 same society. Parent-child value similarity needs to be more finely distinguished into  
436 stereotype-based (or cultural) similarity, which might partly depend on respondents’  
437 socially desirable responding, and unique dyadic similarity (Barni, Ranieri, &  
438 Scabini, 2012). Research focusing on controlling for stereotypes tends to use an *a*  
439 *posteriori* approach, purifying the data from this effect, whereas indirect measures  
440 may help in reducing *a priori* that part of the cultural stereotype which is linked to  
441 socially desirable responding.

442           In addition to this, Vecchione and colleagues (2014) used an Implicit  
443 Association Test aimed at measuring respondents' implicit personality traits in  
444 organizations as a part of personnel assessment. The perception and feeling of being  
445 evaluated showed consequently a response distortion in self-report measures, but not  
446 in indirect ones. Similarly, respondents might over or underestimate the importance  
447 they associate to values based on their perception of what is relevant in a work  
448 context. However, a discrepancy between personal and work environment values  
449 may cause, among others, dissatisfaction; the use of an indirect measure of values  
450 may reduce the possibility of response distortion in this direction.

451           Indirect measures of values may be used for predicting behaviour. Automatic  
452 associative processes (measured via indirect measures) need to be taken into  
453 consideration for understanding of behaviour; indeed, these can be extremely  
454 informative of spontaneous, undeliberate behaviours (e.g., Perugini, 2005). The  
455 relationship between the instrument proposed and behavioural outcomes is even  
456 more interesting considering the clear link between values and behaviours (e.g.,  
457 Roccas et al., 2017; Dentale et al., 2017). It becomes of great importance to test  
458 whether and the extent to which indirect measures of values proposed are useful  
459 tools in predicting a behavioural outcome over and above self-reports.

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464 **Conflict of Interest:** None.

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## VALUES MEASURES ANS SOCIAL DESIRABILITY

574 Table 1.  
 575 Descriptive statistics and Pearson correlation (r) between the two Value IATs and the four  
 576 PVQ values.

	1	2	3	4	5	6
1. PU IAT	1	.486***	.292*	-.265*	.215	-.148
2. AB IAT		1	.275*	-.316*	.259*	-.196
3. Power			1	-.609***	.491***	-.389**
4. Universalism				1	-.428***	.335**
5. Achievement					1	-.320**
6. Benevolence						1
Mean	.006	.011	-1.08	.56	.02	1.13
Standard Deviation	.558	.523	1.05	.85	1.21	.74
Range	-1.13- 1.29	-.96 - 1.12	-3.67- 1.76	-1.10 - 2.33	-2.64- 2.05	-.76 - 2.52

577 *Note.* \*\*\*p < .001, \*\*p < .01, \*p < .05. PU IAT = Power vs. Universalism IAT, AB IAT =  
 578 Achievement vs. Benevolence IAT  
 579

## VALUES MEASURES AND SOCIAL DESIRABILITY

580 Table 2.  
 581 Descriptive statistics for Pearson correlations (r) between VIATs, self-report values and  
 582 social desirability.

	Self-Deceptive Enhancement	Impression Management
PU IAT	-.04	-.09
AB IAT	-.02	-.11
Power	.185	-.357**
Universalism	-.052	.276*
Achievement	-.011	-.280*
Benevolence	-.039	.258*
Mean	3.40	3.65
Standard Deviation	.74	.82
Range	1.75-5.38	1.63-5.13

583 *Note.* \*\*p < .01, \*p < .05. PU IAT = Power vs. Universalism IAT, AB IAT = Achievement  
 584 vs. Benevolence IAT  
 585

## VALUES MEASURES AND SOCIAL DESIRABILITY

586 Table 3.  
 587 Multiple regression models: Moderation of social desirability on implicit (PU IAT) -  
 588 explicit values links.

Predictor	B	p	CI
Power PVQ ( $R^2/\Delta R^2 = .123/.001$ )			
PU IAT	.546	.010	.137; .954
SDE	.265	.089	-.041; .572
PU IAT x SDE	-.077	.808	-.704; .550
Universalism PVQ ( $R^2/\Delta R^2 = .073/.003$ )			
PU IAT	-.405	.024	-.756; -.054
SDE	-.066	.618	-.329; .197
PU IAT x SDE	-.118	.662	-.656; .419
Power PVQ ( $R^2/\Delta R^2 = .211/.001$ )			
PU IAT	.469	.019	.080; .858
IM	-.438	.001	-.701; -.175
PU IAT x IM	.062	.771	-.358; .481
Universalism PVQ ( $R^2/\Delta R^2 = .137/.027$ )			
PU IAT	-.364	.036	-.703; -.024
IM	.267	.023	.038; .497
PU IAT x IM	-.270	.139	-.630; .090

589 *Note.* PU IAT = Power vs. Universalism IAT.  
 590

## VALUES MEASURES ANS SOCIAL DESIRABILITY

591 Table 4.  
 592 Multiple linear regressions: Moderation of social desirability on implicit (AB IAT) -  
 593 explicit values links.

Predictor	B	p	CI
Achievement PVQ ( $R^2/\Delta R^2 = .067/.001$ )			
AB IAT	.595	.030	.058; 1.132
SDE	.012	.950	-.364; .388
AB IAT x SDE	.078	.840	-.695; .851
Benevolence PVQ ( $R^2/\Delta R^2 = .041/.002$ )			
AB IAT	-.272	.102	-.599; .056
SDE	-.050	.713	-.279; .179
AB IAT x SDE	.079	.738	-.392; .550
Achievement PVQ ( $R^2/\Delta R^2 = .111/.002$ )			
AB IAT	.541	.044	.015; 1.068
IM	-.321	.070	-.669; .027
AB IAT x IM	-.112	.727	-.748; .525
Benevolence PVQ ( $R^2/\Delta R^2 = .075/.032$ )			
AB IAT	-.241	.141	-.565; .082
IM	.176	.105	-.038; .389
AB IAT x IM	.300	.123	-.084; .684

594 *Note.* AB IAT = Achievement vs. Benevolence IAT.