

## AN ITALIAN VERSION OF THE GULLIBILITY SCALE

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These two studies aimed to propose an Italian version of the Gullibility Scale (Teunisse et al., 2020), testing its factor structure and verifying antecedents and consequences of gullibility. The Gullibility Scale is a bidimensional scale, composed of 12 items, that was validated in Australia using a large sample. In Study 1, 198 Italian adults completed a questionnaire containing the Italian version of the Gullibility Scale and the Social Desirability Scale. Results confirmed the two-factor structure (persuadability and insensitivity) with a high order factor (gullibility) of the Italian version of the Gullibility Scale; no correlations were found with social desirability. In Study 2, 287 Italian adults completed a questionnaire containing the Italian version of the Gullibility Scale, the Big Five Inventory, and 11 questions on fake news about COVID-19. Results confirmed the same factor structure found in Study 1. With regards to antecedents, results showed that both persuadability and insensitivity positively correlate with agreeableness and neuroticism; while, regarding consequences, results showed that persuadability positively correlates with fake news about COVID-19. Finally, persuadability mediates the relationship between agreeableness and fake news about COVID-19.

Keywords: Gullibility; Gullibility Scale; Big Five; Fake news; COVID-19.

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Gullibility is defined as a tendency to be deceived or exploited, which is repeated in different situations, even when faced with signs of danger or unreliability (Greenspan, 2009a; Teunisse et al., 2020). Greenspan (2009a) suggested a distinction between credulity and gullibility. Credulity refers to the tendency to believe things that lack science-backed evidence, that are ridiculous, or that are judged without critical capacity; on the other hand, gullibility is the behavioral tendency to be deceived and involves concrete actions (for example, handing over a check to a scammer or bank details to scam companies sending spam emails; Greenspan, 2009a). Credulity is linked to a kind of “state of faith” such as believing that someone knows the truth about something (e.g., people who rely on “magicians” or tarot card readers to know the future). When we talk about “state of faith” we must be careful not to confuse it with trust, a concept related, but not equivalent, to gullibility. Indeed, trust, unlike credulous “state of faith” that can be defined as “foolish,” is a positive and healthy trait (Rotter, 1980). Gullibility differs from credulity because it provides psychological coercion, being based on a certain level of “forcing” to do something (Greenspan, 2009a). These two concepts are closely related because the exploitation of a victim’s credulity (state of faith) provides the basis for gullible behaviors (actions carried out by people who let themselves be deceived). Therefore, credulity is the basis of gullibility. Greenspan (2009a) proposed a causative model of gullibility

that is based on four types of factors: situational (e.g., a salesperson making false claims to sell a product), cognitive (e.g., the victim is naive and believes in the type of investment the scammer offers him/her), affective (e.g., the victim is emotionally attached or attracted to the seller), and personality-based (e.g., the victim is a confident or agreeable person). Thus, gullible behavior is the result of one or several of these factors.

#### FACTORS RELATED TO GULLIBILITY

Studies about gullibility are few, partly because many factors can contribute to this behavior (Greenspan, 2009a, 2009b; Greenspan et al., 2001; Langenderfer & Shimp, 2001; Mercier, 2017; Yamagishi et al., 1999). Nevertheless, many studies, starting from the beginning of the 1900s, have analyzed pseudoscientific beliefs and investigated the causes and the motivations that induce a person to be gullible (Conklin, 1919; Zusne & Jones, 1989). They found that even people with good critical thinking are inclined to engage in superstitious and magical thinking. Cognitive (Gilovich, 1991) and motivational (Case et al., 2004; Vyse, 2013) factors underlie these two types of thinking. Gullibility does not depend, however, only on popular superstitions and magical beliefs. The inability to detect subtle signals also depends on other factors. Teunisse et al. (2020) focused on situational factors (e.g., divided attention, cognitive or emotional overload, and fatigue). Others have investigated low social intelligence (i.e., the ability to understand one's internal states and those of others and to know how to deal with them in social situations) as a possible factor linked to gullible behavior (Yamagishi et al., 1999). More recent studies have highlighted a relationship between this behavior and the cognitive style underlying some religious orientations (e.g., dogmatism or religious fundamentalism; Bronstein et al., 2019). Moreover, personality traits such as extraversion, agreeableness, and conscientiousness may signal social conformity and be linked to gullibility (Bègue et al., 2015; Gil de Zúñiga et al., 2017). All of these factors should be investigated further to confirm or refute these relationships.

#### THE GULLIBILITY SCALE

The best known measure to assess gullibility is the Social Vulnerability Scale (Pinsker et al., 2011) based on Greenspan's theoretical model (2009b). It is composed of 15 items representing two factors: gullibility and credulity. The credulity factor is composed of eight items considering financial exploitation behaviors; and seven items assessing the tendency to believe information even though the source from which it comes has proved to be misleading. This scale was intended to identify gullible seniors at risk of financial exploitation. While it is a valid measure of gullibility, it has some limitations. It was created for use with people with cognitive deficits, therefore it is not generalizable to healthy people. Furthermore, it does not distinguish whether an individual is truly gullible or responds to a desire for social acceptance. Another method for measuring gullibility is through the Barnum effect which evaluates the propensity of individuals to accept something unclear and vague (Dickson & Kelly, 1985; Piper-Terry & Downey, 1998). This measure is not free from limitations either; indeed, it could measure rationality rather than gullibility (Layne, 1979).

Recently, Teunisse et al. (2020) tried to validate a new scale for measuring gullibility, seen as the tendency to believe false information even in the face of unreliable signals. They initially created a list of

66 items (e.g., “I think I’m more gullible than the average person,” “I’m not that good at reading the signals of someone trying to manipulate me”) derived from scales involving the concept of gullibility, such as the Social Vulnerability Scale (Pinsker et al., 2011). Through various studies, the scale was reduced to 12 items representing two factors — persuadability and insensitivity. The persuadability factor represents the personal beliefs about susceptibility to persuasion, while insensitivity to cues of unreliability represents the ability and speed to detect signs of unreliability. Moreover, Teunisse et al. (2020) found that gullibility was not related to trust or social desirability, but was related to high levels of agreeableness, social vulnerability, and paranormal beliefs, and to low levels of social intelligence. Finally, the scale was tested in two different samples, a group of victims of scam and a group with high critical thinking; results of this study showed that scam victims presented higher scores on the Gullibility Scale, compared to the group with high critical thinking (Teunisse et al., 2020).

## STUDY 1

The general aim of the present study was to present an Italian version of the Gullibility Scale (Teunisse et al., 2020), verifying its psychometric characteristics and factor structure. In the original paper, Teunisse et al. (2020) proposed a two-factor (persuadability and insensitivity) structure of the Gullibility Scale; however, they also used the general gullibility score. For this reason, we tested a structure with a second-order factor (gullibility) and two first-order factors (insensitivity and persuadability). The effects of social desirability, age, level of education, and gender were tested as well.

## Method

### *Participants and Procedure*

Participants were 198 Italians (35 males and 163 females) born and living in Italy, who completed an online questionnaire posted on popular social networks (e.g., Facebook) between February and March 2020. The participants’ age ranged from 19 to 70 years ( $M = 29.20$ ,  $SD = 10.65$ ); while, regarding the level of education, 116 participants had a junior high or high school diploma and 82 participants had a bachelor’s or master’s degree. Participants were informed that their responses would remain confidential. Ethical approval for this research was granted by the principal investigator’s institution.

### *Measures*

*Gullibility Scale.* The Italian version of the Gullibility Scale (Teunisse et al., 2020) consists of 12 items representing two factors: persuadability and insensitivity to cues of untrustworthiness. The items of the scale were obtained by translating the original items into Italian using the forward-backward method, preserving the original meaning of the items as much as possible. Sample items (with the Italian translation) are “I’m pretty good at working out when someone is trying to fool me (Sono abbastanza bravo a capire quando qualcuno sta cercando di ingannarmi)” for the insensitivity factor, and “My family thinks I am an easy target for scammers (La mia famiglia pensa che io sia un bersaglio facile per i truffatori)” for the

persuadability factor.<sup>1</sup> For each item, participants indicated their level of agreement on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) with 4 being *neither agree nor disagree*. Higher scores mean greater insensitivity and persuasiveness and, therefore, tendencies toward gullibility.

*Social Desirability Scale.* The Italian adaptation of the Social Desirability Scale proposed by Manganeli et al. (2000) was used. The scale consists of 9 items, for each of which participants responded on a 7-point scale ranging from 1 (*absolutely false*) to 7 (*absolutely true*) with 4 being *neither true nor false*. Sample items are: “It doesn’t matter who I’m talking to, I’m always a good listener,” “There have been times when I’ve taken advantage of someone.” The reliability was .57.

## Results

Table 1 shows the item analysis of the Italian version of the Gullibility Scale. As can be observed, skewness and kurtosis for most items were between  $-1.00$  and  $+1.00$  (Bollen, 1989). Moreover, Mardia’s (1970) index was acceptable (1.81) and satisfied the criteria (between  $-1.96$  and  $+1.96$ ). However, the tests for multivariate skewness ( $Z = 5.48, p < .001$ ) and kurtosis ( $Z = 5.53, p < .001$ ) were significant.

TABLE 1  
 Item analysis of the Italian version of the Gullibility Scale

Item	Mean	SD	Skewness	Kurtosis
Insensitivity 1	2.98	1.33	.74	.49
Insensitivity 2	3.23	1.33	.45	-.08
Insensitivity 3	2.87	1.56	.78	-.20
Insensitivity 4	2.89	1.39	.73	-.08
Insensitivity 5	2.99	1.57	.66	-.31
Insensitivity 6	2.90	1.60	.78	-.34
Persuadability 1	2.08	1.37	1.40	1.65
Persuadability 2	2.24	1.42	1.32	1.39
Persuadability 3	2.13	1.33	1.35	1.52
Persuadability 4	1.97	1.20	1.29	1.14
Persuadability 5	2.81	1.64	.64	-.71
Persuadability 6	2.18	1.31	.98	-.07

To test the factor structure of the Gullibility Scale, a confirmatory factor analysis, with a second-order factor (gullibility) and two first-order factors (insensitivity and persuadability), was performed (LISREL 8; Jöreskog & Sörbom, 1996-2001). Because results indicated that the assumption of multivariate normality cannot be accepted, a confirmatory factor analysis with the robust maximum likelihood method was carried out (Schermelleh-Engel et al., 2003). To verify the adequacy of the models we used  $\chi^2$ : a solution fits the data well when  $\chi^2$  is nonsignificant ( $p > .05$ ). Given that this statistic is sensitive to sample size, the two-index strategy (Hu & Bentler, 1999) proposing the combined use of comparative fit index (CFI; Bentler, 1990) and standardized root mean square residual (SRMR; Bentler, 1995) was applied. The model fits the data well if CFI is greater than or equal to .95 and SRMR is smaller than or equal to .08. Results showed that the model fitted the data well —  $\chi^2(53) = 206.28, p < .001$ ; CFI = .95; SRMR = .08 —

and all factor loadings were significant (Figure 1). Also, as for reliability, Table 2 shows that both insensitivity and persuadability factors, as well as the total of Gullibility Scale, have good internal reliability.

With regards to the relation between gullibility and social desirability, results suggested that for both insensitivity and persuadability, as well as the total score of gullibility, no correlations were found with social desirability ( $r_s < .11$ , *ns*). Finally, concerning socio-demographic variables, for both insensitivity and persuadability, as well as the total score of gullibility, no significant differences emerged for gender,  $t_s(196) < 1.28$ , *ns*, and level of education,  $t_s(196) < 0.62$ , *ns*, and no correlations were found with age ( $r_s < .10$ , *ns*).

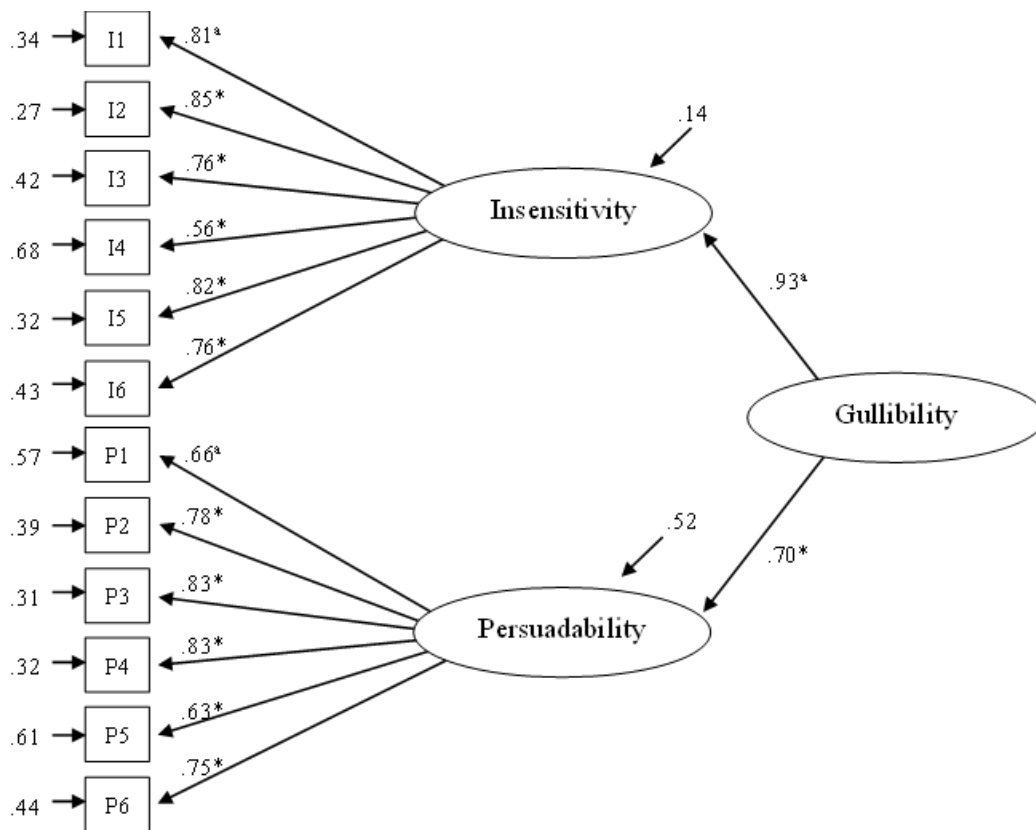


FIGURE 1  
 Standardized parameter estimates in a second-order confirmatory factor analysis  
 of the Italian version of the Gullibility Scale.

Note. <sup>a</sup> fixed parameter. \*  $p < .001$ .

TABLE 2  
 Descriptive statistics and reliability

	Mean	SD	Alpha	Split-half
Insensitivity	2.99	1.18	.89	.80
Persuadability	2.24	1.09	.88	.76
Gullibility	2.61	1.01	.91	.86

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## STUDY 2

The aim of the second study was to verify antecedents and consequences of gullibility. Regarding antecedents, we considered the Big Five personality factors; the literature showed that personality traits such as extraversion, agreeableness, and conscientiousness may emphasize social conformity and therefore, be linked to gullibility (Bègue et al., 2015; Gil de Zúñiga et al., 2017; Standing, & Keays, 1986). However, many studies indicated that only agreeableness was related to levels of gullibility (Greenspan, 2009b; Neel et al., 2016; Teunisse et al., 2020). Agreeableness is, in fact, a personality trait that emphasizes compliance, avoidance of the violation of social norms, and respect for social expectations (Bègue et al., 2015). Agreeable people may be more likely to conform to public opinion and to follow suggestions more readily than others. However, in what way agreeable individuals are more gullible than others is an issue that has yet to be studied. Some authors argue that gullibility is a maladaptive personality trait considered as extreme on the spectrum of agreeableness (Gore et al., 2012; Petterson et al., 2014). For these reasons, we hypothesized a positive relation between gullibility and agreeableness. With regards to neuroticism and openness, no studies have analyzed their relationships with gullibility. However, a study proved that a high level of neuroticism is related to a high level of superstitions (Wiseman & Watt, 2004); so it can be hypothesized that neuroticism should positively correlate with gullibility. In the same way, a study carried out by Swami and colleagues (Swami et al., 2016) found a negative relationship between belief in myths and openness to experience; therefore, it is possible to hypothesize that openness should negatively correlate with gullibility. Moreover, gullibility and suggestibility have been studied together and the literature indicates that introverts are more susceptible to suggestion than extraverts (White, 2008), thus it is possible to hypothesize that extraversion should negatively correlate with gullibility. Finally, as for conscientiousness, no studies have analyzed its relationships with gullibility; however, it is possible to hypothesize that conscientiousness should negatively correlate with gullibility because being careful, or diligent should lead to not being deceived.

Concerning consequences, we considered beliefs in fake news about COVID-19; indeed, various studies indicated that individuals prone to illusion show high trust in fake news which often contains implausible and irrelevant contents (Bronstein et al., 2019; Colliander, 2019; Fletcher & Nielsen, 2018). A study conducted by Shen et al. (2019), found that some social media users are more gullible to fake news than others because they are more susceptible. Susceptibility to fake news is related to the degree of agreement of other network users. We hypothesized that gullibility should be positively related to fake news about COVID-19.

## Method

### *Participants and procedure*

Participants were 287 Italians (170 males and 117 females) born and living in Italy, who completed an online questionnaire posted on popular social networks (e.g., Facebook) between March and May 2020. The participants' age ranged from 20 to 80 years ( $M_{age} = 32.73$ ,  $SD = 11.11$ ); while, regarding the level of education, 119 participants had a junior high or high school diploma, and 167 participants had a bachelor's or master's degree (one participant did not indicate the level of education). Participants were

informed that their responses would remain confidential. Ethical approval for this research was granted by the principal investigator's institution.

### Measures

*Gullibility Scale.* The 12 items of the Italian version of the Gullibility Scale described in Study 1 were used. For each item, participants indicated their level of agreement on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) with 4 being *neither agree nor disagree*. The Cronbach's alphas in the present study were .90 for insensitivity, .90 for persuadability, and .92 for the general gullibility score.

*Big Five Inventory.* The Italian adaptation of the Big Five Inventory (BFI) proposed by Ubbiali et al. (2013) was used. The scale consists of 44 items representing five factors: extraversion, agreeableness, conscientiousness, neuroticism, and openness. Sample items are: "I see myself as a person who is talkative" (extraversion), "I see myself as a person who tends to find fault with others" (agreeableness), "I see myself as a person who does a thorough job" (conscientiousness), "I see myself as a person who gets nervous easily" (neuroticism), "I see myself as a person who is inventive" (openness). For each item, participants indicated their level of agreement on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) with 3 being *neither agree nor disagree*. The Cronbach's alphas were .81 for extraversion, .71 for agreeableness, .81 for conscientiousness, .79 for neuroticism, and .77 for openness.

*Fake news about COVID-19.* Twelve fake news reports about COVID-19, identified by the Italian Ministry of Health (2020) were used (e.g., "Drinking water or hot drinks kills COVID-19," "Pets can transmit COVID-19," "Eating lots of oranges and lemons prevents contagion because vitamin C has a protective action against COVID-19"). For each item, participants indicated their level of agreement on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) with 4 being *neither agree nor disagree*. The reliability was .81.

### Results

#### Factor structure

As in Study 1, to test the factor structure of the Gullibility Scale, we performed a confirmatory factor analysis, with a second-order factor (gullibility) and two first-order factors (insensitivity and persuadability). To verify the adequacy of the models, the same goodness-of-fit indices as in Study 1 were used. In this case too, Mardia's (1970) index was acceptable (1.64) and satisfied the criteria, nevertheless, the tests for multivariate skewness ( $Z = 35.62, p < .001$ ) and kurtosis ( $Z = 17.89, p < .001$ ) were significant, therefore, confirmatory factor analysis with the robust maximum likelihood method was carried out (Schermelleh-Engel et al., 2003). Results showed that the model fitted the data well —  $\chi^2(53) = 304.83, p < .001$ ; CFI = .97; SRMR = .08 — all factor loadings, as well as the paths from second-order factor to first-order factors, were significant ( $\lambda_s$  comprised between .69 and .91;  $\gamma_{11} = .77$  and  $\gamma_{21} = .71$ ).

To investigate the divergent and convergent validity of the Italian version of the Gullibility Scale, a confirmatory factor analysis, aimed to detect associations between the two factors of gullibility (insensitivity and persuadability), the Big Five factors (extraversion, agreeableness, conscientiousness, neuroticism, and openness), and fake news about COVID-19, was performed. To test the model, two aggregated



indicators were obtained for each variable by randomly splitting the respective items (Bagozzi & Heatherton, 1994). The goodness-of-fit indexes indicated that the model fit the data well:  $\chi^2(76) = 196.86$ ,  $p < .001$ ; CFI = .95; SRMR = .042; moreover, all factor loadings were significant and ranged between .69 and .96. As reported in Table 3, insensitivity is negatively correlated with extraversion, conscientiousness, and openness, whereas it is positively correlated with neuroticism. Persuadability is negatively correlated with conscientiousness and positively correlated with neuroticism. Finally, both factors of gullibility are positively correlated with fake news about COVID-19.

With regards to descriptive statistics of measure (Table 3), results showed that participants have low levels of insensitivity and persuadability (general gullibility score:  $M = 2.61$ ,  $SD = 1.11$ ). In Study 1, no correlation was found between age and both factors of gullibility ( $r_s < .04$ ,  $ns$ ), nor any effect of level of education,  $t_s(284) < 0.73$ ,  $ns$ . As for gender, no effect was observed for persuadability,  $t(285) = 1.80$ ,  $ns$ , while a small difference was found for insensitivity,  $t(285) = 2.16$ ,  $p < .05$ : male participants ( $M = 2.83$ ,  $SD = 1.22$ ) seemed to be less insensible to cues of unreliability than female participants ( $M = 3.17$ ,  $SD = 1.33$ ). Concerning other variables, results proved that participants had medium-high levels of extraversion, agreeableness, conscientiousness, and openness, and low levels of neuroticism; finally, participants did not believe in fake news about COVID19.

#### *Antecedents and Consequences of Gullibility*

To verify antecedents and consequences of gullibility, as well as its potential mediating effects on the relationship between the Big Five factors and fake news about COVID-19, a path analysis with latent variables was run (LISREL 8; Jöreskog & Sörbom, 1996-2001).<sup>2</sup> Results demonstrated that the model fit the data well:  $\chi^2(76) = 196.86$ ,  $p < .001$ ; CFI = .95; SRMR = .042. As seen in Figure 2, agreeableness and neuroticism positively correlated with both insensitivity and persuadability. Moreover, results showed that persuadability positively correlates with fake news about COVID-19. Consequently, people characterized by high levels of trust, compliance, emotional instability, and maladjustment tend to be more gullible; furthermore, people characterized by high levels of persuadability tend to believe in fake news. As for the mediating effects of persuadability and insensitivity, results indicated a significant indirect effect only for agreeableness, whose effects on fake news were partially mediated by persuadability ( $Z = 2.57$ ,  $SE = 0.08$ ,  $p < .01$ ), while the mediating effects of insensitivity were not significant ( $Z = -1.20$ ,  $SE = 0.03$ ,  $ns$ ). Concerning the mediating effect of persuadability, the direct effect of agreeableness on fake news is negative, while the indirect effect is positive, indicating that persuadability acts as a suppressor variable (MacKinnon et al., 2007; MacKinnon et al., 2000).

#### DISCUSSION

This paper aimed to propose an Italian version of the Gullibility Scale (Teunisse et al., 2020). In Study1 we tested a structure with a second-order factor (gullibility) and two first-order factors (insensitivity and persuadability) and the effect of social desirability. Results showed that the scale possessed a good internal consistency, and its bi-factorial structure with a high order factor was confirmed. As for the relation between gullibility and social desirability, results proved that for both insensitivity and persuadability, as well as the total score of gullibility, no correlations were found with social desirability.



TABLE 3  
Means, standard deviations, and correlations

	Mean	SD	1	2	3	4	5	6	7	8
1 Extraversion	3.40	0.69	1							
2 Agreeableness	3.75	0.58	.34***	1						
3 Conscientiousness	3.83	0.63	.39***	.38***	1					
4 Neuroticism	3.15	0.73	-.33***	-.24**	-.52***	1				
5 Openness	3.84	0.59	.38***	.13	.20**	-.17*	1			
6 Insensitivity	3.03	1.29	-.19***	.06	-.17*	.27***	-.16*	1		
7 Persuadability	2.18	1.25	-.06	.13	-.14*	.19**	-.04	.60***	1	
8 Fake news about COVID-19	1.81	0.74	.02	-.14	.02	.02	-.02	.17*	.44***	1

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

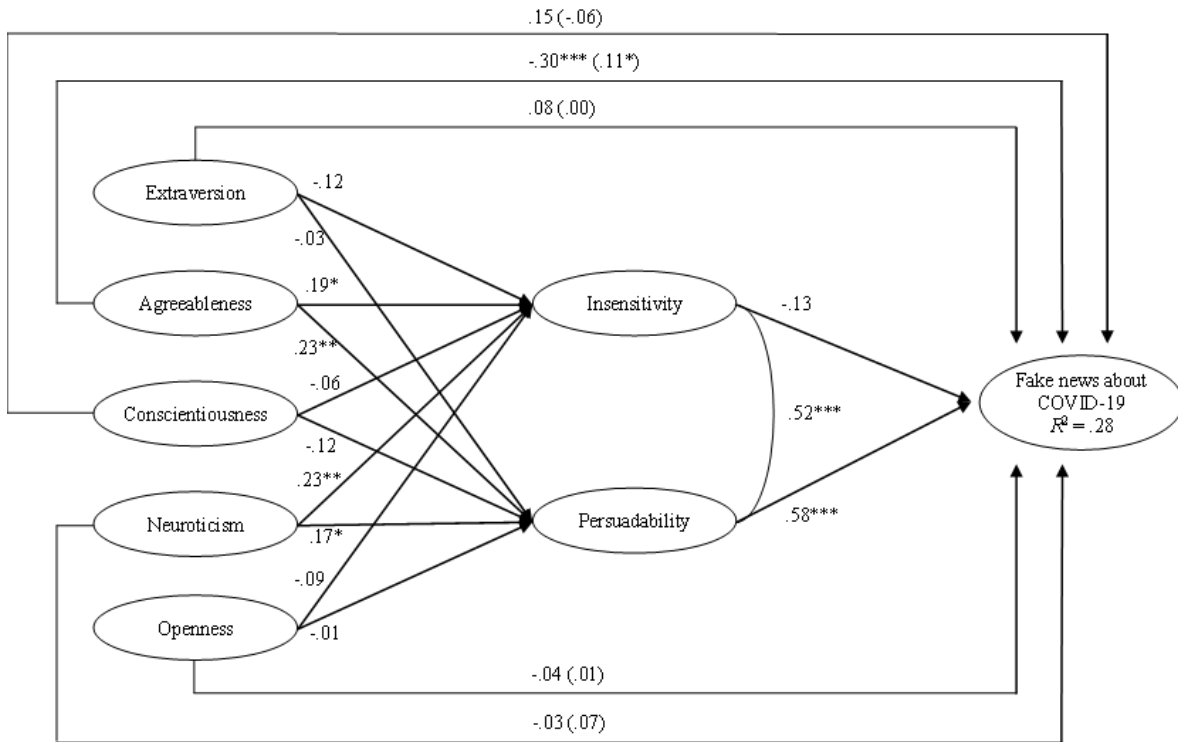


FIGURE 2  
 Antecedents, consequences, and mediating effects of gullibility.  
 Note. Indirect effects are shown in brackets. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

The factor structure of the scale was also confirmed in Study 2. Moreover, this second study tested antecedents and consequences of gullibility. Regarding antecedents, we considered the Big Five personality factors; whereas, regarding consequences, we considered beliefs in fake news about COVID-19. As in the original study (Teunisse et al., 2020), we found a significant positive relationship between both factors of gullibility and agreeableness: the more confident and compliant people are, the more gullible they are. The link between agreeableness and gullibility seems to be confirmed by neuroendocrinological studies which suggested that people with high levels of oxytocin (a hormone promoting factors such as empathy and trust, strictly tied with agreeableness) are less able to distinguish true statements from false ones (Pfundmair et al., 2017). Moreover, we found that persuadability mediates the relationship between agreeableness and fake news. The direct effect of agreeableness on fake news is negative: the more agreeable people are the less they believe in fake news. However, the indirect effect is positive: high levels of agreeableness are related to high levels of persuadability, which in turn are related to believing in fake news. Finally, our results indicated that neuroticism positively correlated with both insensitivity and persuadability: the more emotionally unstable people are, the more gullible they are.

With regards to consequences, our results demonstrated that persuadability is positively correlated to fake news about COVID-19, suggesting that people with high persuadability more easily believe in fake news. Also insensitivity presented a positive correlation with fake news, but this correlation disappears when entering persuadability in the regression model. That means that people believing in fake news do so more because they are easily persuaded than because they are insensitive to untrustworthy clues.

Finally, concerning socio-demographic variables, for both insensitivity and persuadability no effects of age, gender, and level of education were found in Study 1, and little effects of gender only for insensitivity were found in Study 2. These results only partially confirmed those obtained by Teunisse and colleagues (2020); indeed, in the original study for both gullibility factors, women had significantly higher scores than men. Studies 1 and 2 confirmed that the Gullibility Scale, both in the original and in the Italian version, is a reliable and valid measure of gullibility.

### Strengths and Limitations

As discussed in the introduction, little research has been done on gullibility. These two studies, therefore, are greatly innovative elements from an applied point of view. Indeed, this scale may be a useful self-assessment measure of gullibility and could help identify potential victims of scams in the Italian context. As we have seen in the second study, the scale may be useful in preventing beliefs about fake news, such as those about COVID-19. This would allow many people to be assisted in advance and prevent false information from causing economic, health, emotional, cultural, and other related damage.

Despite the Gullibility Scale seeming to be a good tool, it is a self-report measure which might hide a potential limitation. Indeed, gullible people may not be aware of their gullibility; the scale, therefore, runs the risk of not accurately assessing levels of gullibility. Future research is needed to investigate other factors related to gullibility to further validate the scale.

These two studies, however, have some limitations. The first one is related to the gender of participants, which, especially in Study 1, was not well balanced (35 males and 163 females). This limitation derives from the fact that the sample was obtained through voluntary participation, and women were more willing to answer the questionnaire. It would be desirable to repeat the study with a well-balanced sample in the future.

The second limitation concerns the interference of other variables that were not considered, such as the direct or indirect personal experience (for example of a family member or close friend who experienced episodes of fraud or scam), the degree of exposure or use of social media, or other related factors that could play a role in determining gullibility. These factors potentially influencing gullible tendencies should be considered as a starting point for future research.

### CONCLUSION

Fake news and misinformation are very dangerous when it comes to health, and it is often not easy to wade through millions of pieces of information. In this particular historical period characterized by the COVID-19 pandemic, the spreading of false information has given rise to many problems (World Health Organization [WHO] et al., 2020). The WHO (2020) defines it as “infodemic” — the circulation of an excessive amount of information, which makes it difficult to orient oneself on a specific topic due to the difficulty of identifying reliable sources (see also, Skarpa & Garoufallou, 2021). Our studies on gullibility are placed precisely in this particular context. During the emergency caused by COVID-19, articles were disseminated proposing remedies to avoid contagion, recommending various drugs available on the market to treat the virus, or constructing conspiracy theories on the causes of its spreading (WHO, 2021).

This gullibility self-assessment scale can be considered a prevention tool helping identify potential victims of fake news. This would allow the early assessment of the tendency to believe fake news and prevent them from causing damage to health.

#### NOTES

1. The Italian version of the Gullibility Scale is available from the corresponding author upon request.
2. Due to the limited effects of demographic variables on gullibility (no effects of age, gender, and level of education in Study 1 and little effects of gender only for insensitivity in Study 2) these variables were not included in the model.

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