

## MEASUREMENT PROPERTIES OF THE SYSTEM JUSTIFICATION SCALE: A RASCH ANALYSIS

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In the present study, we analyzed the measurement properties of the general version of the System Justification Scale in Italy using the Partial Credit Model with a sample of 544 youths (182 males,  $M_{\text{age}} = 17.47$ ,  $SD = 1.59$ ). The scale was unidimensional and showed acceptable measurement properties. However, its format should be reduced from seven to four categories. Moreover, the scale was able to discriminate people with intermediate system justification scores, while it did not discriminate those with extreme scores. Directions for future research are discussed in light of the present findings.

**Key words:** System justification; System Justification Scale; Rasch model; Political psychology; Partial Credit Model.

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*There are no more ideologies in the authentic sense of false consciousness,  
only advertisements for the world through its duplication  
and the provocative lie which does not seek belief but commands silence.*  
(Theodor W. Adorno)

As reflected in the quotation above, ideology may lead people to support the system (in terms of cultural worldviews, social organization, and economic stratification), that is, the structure through which people may draw rules, meanings, predictions, judgments, and so on, even to their detriment. The system justification theory, originally formulated by Jost and Banaji (1994) to explain intergroup relations and prejudice toward outgroups, posits that people differ in their motivation to accept and to support the societal status quo even at the expense of their own, or of their own group's, interest (Jost, Banaji, & Nosek, 2004; Jost & van der Toorn, 2012). People who strongly endorse system-justifying beliefs support the legitimacy of the status quo, internalize inequality, and derogate potential alternative worldviews (Jost & Hunyady, 2005; Zimmerman & Reyna, 2013).

Compared to research based on other models, such as social identity theory (Tajfel & Turner, 1986), social dominance theory (Sidanius & Pratto, 1999), or the just world theory (Lerner, 1980), research based on system justification theory has addressed a much wider set of concerns, from the use of stereotypes to the development and maintenance of self-esteem and psychological wellbeing among members of disadvantaged groups who support the system and oppose egalitarian reforms (Jost & Thompson, 2000; Major, Mendes, & Dovidio, 2013; Olson, Dweck, Spelke, & Banaji, 2011; Osborne & Sibley, 2013). These various phenomena pertain, in one way or another, to the antecedent conditions, manifestations, and/or consequences of the system justification motives, described in terms of epistemic needs aimed to reduce feelings of uncertainty, randomness, and uncontrollability (Kay et al., 2009). Similarly, existential and relational needs may be behind these epistemic needs. Uncertainty and randomness are especially salient when individuals cope with threats (Jost, Glaser, Kruglanski, & Sulloway, 2003), while uncontrollability often stems from belongingness and shared beliefs (Jost, Ledgerwood, & Hardin, 2008).

Believing that the world is a fair and just place may have significant effects on quality of life at both at the individual and societal level. On the individual level, research has shown that system-justifying ideologies may serve as coping mechanisms that promote mental health and reduce negative affect (Dzuka & Dalbert, 2007; Rankin, Jost, & Wakslak, 2009). However, the endorsement of system-justification ideologies can also have negative consequences in that it may contribute to the stability of unjust and unfair social and political systems (Kay et al., 2009; Jost & Hunyady, 2005).

Past work on system justification has shown that people differ in their tendency to hold favorable attitudes toward social, economic, and political systems (Jost & Thompson, 2000; Jost et al., 2010; Kay & Jost, 2003). These results were found via the System Justification Scale, a partially balanced scale (just two items are “con-trait”) composed of eight items with seven response (or sometimes nine) categories that aim to evaluate people’s general motivation to perceive the status quo as stable, reasonable, fair, and legitimate. The original System Justification Scale was developed in the USA, and translated versions have been administered in other countries, such as Israel, Turkey, UK (Jost, Kivetz, Rubini, Guermandi, & Mosso, 2005), Germany (Ullrich & Cohrs, 2007), Poland, Italy, Canada (Laurin, Shepherd, & Kay, 2010), and Hungary (Jost et al., 2005) to cross-culturally validate the theory (Cichočka & Jost, 2014). Table 1 reports the original items of the scale and their Italian version, developed by Jost and colleagues (2005) and systematically used in subsequent research (e.g., Mosso, Briante, Aiello, & Russo, 2013; Pacilli, Taurino, Jost, & van der Toorn, 2011). All of the items response categories have a label.

The psychometric characteristics of all of these versions have been tested according to standards from the classical test theory (based mainly on the analysis of Cronbach’s alpha). However, in the methodological literature, these standards have been complemented by more advanced psychometric approaches, particularly by the Rasch (1960) measurement model. Although not fully widespread in psychological and social research, this approach is particularly promising for researchers who aim to analyze the psychometric properties of a scale, for two main reasons. First, it allows for the identification of key measurement issues not easily detectable by classical test theory analyses (e.g., Lambert et al., 2013; Pallant & Tennant, 2007; Tennant & Conhagan, 2007). Second, attitude scales developed and validated using the Rasch model may be used in different contexts and with different samples without resorting to complex and questionable administration to normative samples (Miceli, 2001).

TABLE I  
Items of the original System Justification Scale and of the Italian version of the scale

SJ1	In general, you find society to be fair [In generale ritieni che la società sia equa]
SJ2	In general, the American political system operates as it should [In generale, il sistema politico italiano opera come dovrebbe]
SJ3	American society needs to be radically restructured (reversed) [La società italiana dovrebbe essere radicalmente ristrutturata]
SJ4	The United States is the best country in the world to live in [L'Italia è il miglior paese del mondo in cui vivere]
SJ5	Most policies serve the greater good [La maggior parte delle politiche sono dirette a ottenere il miglior risultato possibile]
SJ6	Everyone has a fair shot at wealth and happiness [Ognuno ha le sue opportunità di perseguire ricchezza e felicità]
SJ7	Our society is getting worse every year (reversed) [La nostra società sta peggiorando di anno in anno]
SJ8	Society is set up so that people usually get what they deserve [La società è strutturata in modo tale che le persone ottengano ciò che meritano]

Note. The categories' labels are as follows. 1: *I completely disagree*. 2: *I strongly disagree*. 3: *I moderately disagree*. 4: *I do not disagree, nor agree*. 5: *I moderately agree*. 6: *I strongly agree*. 7: *I completely agree*.

#### THE RASCH MODEL IN THE EVALUATION OF ATTITUDE SCALES

The Rasch (1960) measurement model is based on the general assumption that the answers given by a sample of participants to a test of ability composed of dichotomous items depend only on two parameters, the ability of the single participant ( $\beta_n$ ) and the difficulty of the single item ( $\delta_i$ ), conceptualized as expressions of the same latent trait. In this paper, we will use the standard terminology to refer to the tests of ability instead of jumping systematically from such terminology to that concerning attitude measurement. One important consequence of applying the Rasch model is the linearity of the estimated scores, which are expressed in logits (Wright & Masters, 1982), corresponding to the logarithm of the ratio between the probability of giving the correct answer and that of giving an incorrect answer. The possibility of getting separate estimates for participants and items using the same unit of measurement allows the researcher to place participants' and items' parameters on the same continuum and to make invariant (i.e., independent of the sample and of the items used) comparisons among participants, among items, and among participants and items. Thus, using the Rasch model, it is possible to test the adequacy of the items' difficulty compared to the participants' ability, and vice versa.

Different probabilistic measurement models have been proposed for polytomous items with ordered categories, such as the Rating Scale Model (RSM; Andrich, 1978) and the Partial Credit Model (PCM; Master & Wright, 1997). The distinguished characteristics of the polytomous models are presented in numerous publications (e.g., Embretson & Reise, 2000; van der Linden & Hambleton, 1997). For items with the same response format, the RSM describes each item with a single scale location parameter ( $\delta_i$ ), which reflects the relative item difficulty, while the category thresholds ( $\tau_j$ ) of all items in the measures govern the transition from the category  $k-1$  to the category  $k$ . Response categories are considered equal across items. On the other hand, the

PCM makes no assumption about the relative difficulties of the steps within any item. Thus, it is the most appropriate for analyzing responses to multi-category attitude scales, as in this case (Wright & Masters, 1982).

In the PCM framework, given a polytomous item with response categories  $J = 1, 2, \dots, J$  being the response variable for a particular individual to the  $i$ th item denoted by  $Y_i$ , the probability of  $Y_i = j$  can be expressed as:

$$P(Y_i = j | \beta_n, \delta_i, \tau_{ij}) = \frac{\exp \sum_{k=0}^j (\beta_n - \delta_i - \tau_{ij})}{\sum_{l=0}^J \exp \sum_{k=0}^l (\beta_n - \delta_i - \tau_{ij})}$$

where the parameter  $\tau_{ij}$  represents the difficulty associated with the transition from category  $j-1$  to  $j$  in relation to the difficulty of the item ( $\delta_i$ ). The step parameter can be defined as an additive term that includes the item and threshold effects ( $\gamma_{ij} = \delta_i + \tau_{ij}$ ).

In applying the PCM, it is important to consider the extent to which the threshold parameters ( $\tau_{ij}$ ) should be ordered. Here, the problem is whether the transition from a lower to a higher response category within an item is consistent with an increase in the underlying trait. Where this does not occur, "disordered thresholds" are present, and such categories should be collapsed before fitting the model. The presence of disordered thresholds may be due to not discriminant response categories (Giampaglia, 1990) or tests that are not one-dimensional (Giampaglia, 2008).

The main aim of this study was to analyze the measurement properties of the standard Italian version of the System Justification Scale using the Partial Credit Model.

### Procedure

The standard Italian version of the System Justification Scale was administered in an Italian sample of 544 students (182 males, mean age = 17.47,  $SD = 1.59$ , range 14-20). The items were rated on a 7-point Likert scale, from 1 (*I completely disagree*) to 7 (*I completely agree*). The data were collected in the students' classroom. Before performing our analyses, we reversed the two con-trait items. At present, a formal validation of this scale does not exist, and the full list of these items has never been published (even if the third and the fourth authors of this article have used it in their previous research).

### Data Analysis

The PCM was used to jointly estimate the items' and the participants' parameters. For each item, infit and outfit indexes were computed. Infit and outfit respectively measure unexpected responses to items with a difficulty level close to the respondents' ability and unexpected responses to items with a difficulty level different from their ability. Items with a mean square fit between .70 and 1.3 were considered to have acceptable fit (Wright & Stone, 1979). We analyzed the order of the thresholds for each item, collapsing categories with disordered thresholds.

Two separate PCMs were implemented, the first on the original 7-category scale items and the second on a reduced format scale (4-category scale). Both models were evaluated with respect to the Person Separation Index (PSI), which indicates the internal consistency of the scale

and its power to discriminate among participants with different ability levels of the construct under analysis. Based on Tennant and Conhagan (2007), we considered the solution's PSI acceptable when above the .70 threshold. Like Cronbach's alpha, the PSI is influenced by the number of the items of the scale. Thus, as suggested by Briggs and Cheek (1986), given that we used a short scale, we also analyzed the item-total correlation, which provides a basic review of the PCM assumption that items have similar discriminability. Moreover, we evaluated the fit of our solutions at the participant and item levels.

All analyses were performed using Winsteps (Linacre & Wright, 1999).

## RESULTS

Table 2 shows the descriptive statistics for the items, while Table 3 reports the percentage of each response category.

TABLE 2  
 Descriptive analysis of the items of the System Justification Scale

Item	Mean	SD	Skewedness	Kurtosis	Median	Quartile range
SJ1	2.45	1.25	.78	.56	2	2
SJ2	2.07	1.13	.91	.43	2	2
SJ3(Reversed)	2.68	1.41	.71	.18	3	2
SJ4	3.05	1.52	.43	-.20	3	2
SJ5	3.11	1.42	.31	-.55	3	2
SJ6	3.43	1.66	.33	-.65	3	3
SJ7 (Reversed)	2.66	1.44	.75	.28	3	3
SJ8	2.51	1.28	.74	.34	2	2

TABLE 3  
 Percentage of responses for each response category. All rows sum 100

Item	Seven response categories						
	1	2	3	4	5	6	7
SJ1	27.21	26.47	29.41	10.29	4.96	.92	.74
SJ2	27.21	26.47	29.41	10.29	4.96	.92	.74
SJ3	40.63	26.47	21.51	8.64	2.21	.37	.18
SJ4	25.37	21.88	28.13	14.15	6.43	2.57	1.47
SJ5	20.40	17.46	21.69	27.21	7.17	2.94	3.13
SJ6	14.15	22.79	24.82	20.04	13.97	3.13	1.10
SJ7	14.34	16.18	26.10	15.07	17.10	6.07	5.15
SJ8	26.47	23.35	23.16	17.46	5.88	1.47	2.21

The higher categories (categories 5, 6, and 7) of almost all the items were selected by less than the 5% of the respondents. This small percentage helped to identify potential categories to collapse. However, before collapsing them, a PCM on the original scale was performed. Table 4 reports the items' difficulty ( $\delta$ ) and the threshold parameters ( $\tau$ ) that confirmed that disordering involved categories 4 through 7.

TABLE 4  
 Psychometric characteristics of the items of the System Justification Scale (seven response categories)

	SJ1	SJ2	SJ3	SJ4	SJ5	SJ6	SJ7	SJ8
$\delta$ (SE)	.2 (.04)	.63 (.05)	.0 (.04)	-.27 (.04)	-.19 (.04)	-.54 (.04)	-.06 (.04)	.23 (.04)
Response format	Category thresholds: $\tau$							
1	None	None	None	None	None	None	None	None
2	-1.41	-1.25	-1.16	-1.03	-1.87	-1.23	-1.11	-1.43
3	-1.05	-1.03	-1.06	-.88	-.87	-1.00	-.74	-1.18
4	.40	-.05	.17	-.58	-.24	.35	-.17	.38
5	.32	.64	.51	1.23	.17	-.07	.87	.23
6	1.50	1.29	.85	1.00	1.53	1.31	1.37	.83
7	.24	.40	.69	.25	1.29	.64	-.23	1.18

Note. The person reliability and separation indexes were .73 and 1.63, respectively, and the item reliability and separation indexes were .98 and 8.01, respectively.  $\delta$  = Justification level, SE = standard error, and  $\tau$  = step calibration, that is, the difficulty associated with the transition from category  $j-1$  to  $j$  for each item.

After collapsing the disordered categories, the items were recalibrated. The mean person location was  $.05 \pm 1.17$  (range =  $-3.92$  to  $4.14$ ), the person separation index (PSI =  $.74$ ) and the reliability (=  $1.69$ ) were acceptable, indicating that the scale may be used to separate people into two statistically distinct strata. Moreover, the PSI of the scale resembled the alphas it showed in previous administrations, that ranged from  $.67$  (Pacilli et al., 2011) to  $.77$  (Mosso et al., 2013). Finally, there was no response category threshold disordering. Fit statistics, justification ratings ( $\delta_i$ ), standard error, threshold parameters ( $\tau_{ij}$ ) and item-total correlation are presented in Tables 5a and 5b.

The item-total correlations suggest that items had highly similar discrimination indexes, ranging from  $.57$  (item 4) to  $.68$  (item 2). Items 2 and 4 presented borderline infit and/or outfit statistics. Although the reduced format items showed good fit statistics, they showed a reduced breadth of item difficulty. Indeed, people's abilities ranged from a  $-3$  to a  $+3$  logits, while the range covered from the lowest category of the easiest item (i.e., of item 6) to the highest category of the most difficult item (i.e., of item 2) ranged from  $-1.00$  to  $1.65$ . Thus, as depicted by the items/person map shown in Figure 1, the scale failed to represent higher and lower levels of justification and tended to be redundant around the center of the person distribution.

TABLE 5A  
 Psychometric characteristics of the items of the System Justification Scale (four response categories)

Item	Difficulty		Infit		Outfit		Correlation
	$\delta$	SE	MNSQ	Z	MNSQ	Z	
SJ1	.31	.05	1.00	.1	.99	-.1	.62
SJ2	.79	.05	.81	-3.6	.84	-2.4	.68
SJ3	.06	.05	1.05	.9	1.05	.8	.61
SJ4	-.35	.05	1.20	3.3	1.25	2.9	.57
SJ5	-.51	.05	.92	-1.5	.90	-1.5	.65
SJ6	-.61	.05	1.06	1.1	1.05	.6	.60
SJ7	.05	.05	1.08	1.5	1.10	1.5	.60
SJ8	.25	.05	.88	-2.2	.89	-1.9	.66

Note. The person reliability and separation indexes were .74 and 1.69, respectively, and the item reliability and separation indexes were .99 and 8.22, respectively.  $\delta$  = Justification System level; MNSQ = mean square fit statistics; z = standardized mean square fit statistics. Correlation reports the point-biserial correlation between items and the total system justification level based on the PCM estimates.

TABLE 5B  
 Category thresholds for reduced response format (four response categories)

	SJ1	SJ2	SJ3	SJ4	SJ5	SJ6	SJ7	SJ8
Response format	Category thresholds: $\tau$							
1	None	None	None	None	None	None	None	None
2	-.75	-.62	-.46	-.20	-.79	-.39	-.45	-.69
3	-.27	-.24	-.25	.03	.28	-.07	.02	-.32
4	-1.02	.86	.71	.17	.51	.46	.43	1.01

Note.  $\tau$  = step calibration, that is, the difficulty associated with the transition from category  $j-1$  to  $j$  for each item.

## DISCUSSION

In the present study, we evaluated the measurement properties of the System Justification Scale in Italy using the Partial Credit Model. The reliability and criterion validity of the scale were good. The scale proved to be unidimensional and, as a whole, showed a reasonable fit. However, two main problems stemmed from our analyses. Both of them could be detected thanks to the advanced psychometric approaches we used and would not have been identified through approaches based on the standard classical test theory.

First, the PCM allowed us to test the adequacy of the number of categories of the System Justification Scale. Our analyses showed that specific attention should be given to the response format of the System Justification Scale. As sometimes happens in psychological research (see, for instance, Altemeyer, 1996; Sidanius & Pratto, 1999), Jost and colleagues (1994) chose a 7- and





sometimes even a 9-point scale, larger than the standard 4 to 6) response categories, possibly with the idea to give their participants the possibility to express their answers in a fine-graded way. However, Rasch analyses systematically show that scales with such a large number of categories often include nondiscriminant categories (e.g., Di Stefano & Roccato, 2005; Gattino & Roccato, 2002; Giampaglia & Roccato, 2002). This held true also in this research, which showed that the optimal number of categories of the System Justification Scale is four and that using wider formats would lead to the inclusion of nondiscriminant categories (Giampaglia, 1990). Our suggestion to use the 4-category format, stemmed from our Rasch analyses, is consistent with methodological research showing that is not too restrictive for the large majority of people who take part in surveys and polls (Schuman & Presser, 1981).

Second, the System Justification Scale was shown to be a valuable tool in discriminating people with intermediate system justification scores but was found to be inadequate to do the same among people with more extreme system justification scores. We believe that this is a relevant problem because it implies that, to date, the research on the predictors, causes, and correlates of system justification (on October 22, 2014 PsycInfo reported 111 articles with “system justification” in their title) has failed to adequately identify people who endorse system justification either very strongly or very weakly. In fact, the large majority of psychological studies are performed on student samples, systematically composed of people who, compared to the general population, show lower levels of prejudice (Joe, Jones, & Ryder, 1977; Sears, 1986) and thus plausibly show low levels of system justification. In this light, the impossibility of discriminating people high in system justification might be considered not very negative. However, researchers interested in surveying samples from the general population would have serious problems measuring their system justification level properly.

Two specific comment should be made on the partially balanced structure and on the content of some items of the System Justification Scale. First, according to the literature (e.g., Bode, 2001; Enos, 2000; Grosse & Wright, 1986; Wright & Masters, 1982), reversed items may cause measurement problems and, consequently, may be affected by high misfit values. However, in social and psychological research balanced scales are the standard, as they allow to detect acquiescent responses (Alreck & Settle, 1995) and to fix data biased by this response bias (Marsch, 1989). Moreover, our reversed items did not show misfit indexes. Hence, their inclusion in the System Justification Scale seems useful and adequate. Second, the sixth item of the scale (“Everyone has a fair shot at wealth and happiness”) is double-barrelled, in that it contains two meanings (“Everyone has a fair shot at wealth” and “Everyone has a fair shot at happiness”). In fact, items like this are somewhat common in psychological scales. For instance, in Altemeyer’s (1996) Right-Wing Authoritarianism scale there are items such as “Our country will be great if we honor the ways of our forefathers, do what the authorities tell us to do, and get rid of the ‘rotten apples’ who are ruining everything,” and in Berzonsky’s (1989) Identity Style Inventory there are items such as “I’ve spent a good deal of time reading and talking to others about religious ideas.” However, non-double-barrelled items should be the standard in sound questionnaires (Funke, 2005), and item 6 of the Social Justification Scale is not fully convincing.

To conclude, based on the relevant opportunities afforded by the PCM, future research should be performed to add new, more extreme, non-doubled-barrelled, and possibly con-trait items to those that compose the standard System Justification Scale, to discriminate more adequately among participants along the entire system justification continuum. Due to the mathe-

metrical properties of the Rasch model, this new research should include at least one item of the standard scale. Contrary to what happens in studies based on the classical test theory, it would not require large-scale, questionable pre-tests.

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