

## Further Validation of the Multidimensional Measure of Parasocial Relationships (MMPR)

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The Multidimensional Measure of Parasocial Relationships (MMPR) was described by the authors as a preliminary study (Garcia et al., 2022). One of our objectives was to further validate the MMPR by testing its factor structure, reliability, and validity by correlating the measure with the Celebrity Attitude Scale (CAS) and replicating a mediation model with both the MMPR and the CAS in samples from three countries. Another objective was to determine if the pattern of relationships observed in the Garcia et al. (2022) study would also be observed using the MMPR and the CAS. Specifically, do MMPR and CAS scores predict self-esteem mediated by social comparison scores in three countries? We administered the Multidimensional Measure of Parasocial Relationships (MMPR), the Celebrity Attitude Scale (CAS), a short version of the Iowa-Netherlands Comparison Orientation Measure (INCOM) and Rosenberg's Self-esteem scale to university students in Hungary ( $N = 285$ ), Canada ( $N = 252$ ) and Indonesia ( $N = 321$ ). A bifactor structure of the MMPR with correlated factors showed acceptable fit in all three countries, similar to the original study. Reliability of the MMPR subscales was generally low, but the internal consistency of the total scale was good. Though the purpose of the scales is a bit different from each other, we found a moderately positive correlation between the MMPR and the CAS in all three countries. Social comparison fully mediated the association between parasocial relationship and self-esteem in the Indonesian and Canadian samples, while partial mediation was found in the Hungarian sample. Moreover, social comparison fully mediated the association between celebrity worship and self-esteem in all three countries. Evidence suggesting a primarily unidimensional structure of the MMPR, low reliability of the subscales, and inconsistent findings regarding the mediation model across countries indicate that further development of the MMPR is necessary.

Keywords: Multidimensional Measure of Parasocial Relationships, Celebrity Attitude Scale, self-esteem, parasocial, comparison orientation

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*North American Journal of Psychology*, 2025, Vol. 27, No. 1, 35-52.  
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A parasocial relationship is a one-sided relationship resulting from exposure to a celebrity through the media (Garcia et al., 2022). The study of celebrity worshipers, defined as those who invest much time and energy in parasocial relationships with a favorite celebrity, is of considerable importance, given that excessive celebrity admiration is frequently associated with problematic attitudes (Collisson et al., 2018; Maltby et al., 2011; McCutcheon et al., 2016), behaviors (Aruguete et al., 2014; Giles & Maltby, 2004) and cognitive deficits (McCutcheon et al., 2003, 2021). Furthermore, a recent review of 35 studies using the same measure of celebrity worship showed a 20-year trend toward an increase in excessive celebrity admiration (McCutcheon & Aruguete, 2021). Given that 20-year trend and an alarming tendency for some celebrities to misuse their fame by spreading lies, promoting conspiracy theories, and advocating violence (Grabbe et al., 2022), it is important to continue to learn more about those who worship such celebrities.

Over the course of several years, McCutcheon and colleagues (Ashe et al., 2005; Griffith et al., 2013; Maltby et al., 2002, 2011; Maltby & McCutcheon, 2001) have measured degrees of admiration for a favorite celebrity using the *Celebrity Attitude Scale* (CAS). Its 23 items were created to measure the *extent* to which individuals admired their favorite celebrities. To date more than 100 published articles have used the *Celebrity Attitude Scale* (CAS) in one form or another, and a host of studies have established its reliability and its convergent and external validities (e.g., Griffith et al., 2013, Hitlan et al., 2021; & see Brooks, 2018, for a review).

Garcia et al. (2022) developed the *Multidimensional Measure of Parasocial Relationships* (MMPR) to measure people's attitude towards social media figures and the extent to which these celebrities influence their daily lives. Respondents are directed to first think of a media figure that they follow the most, then, respond to 18 items about that media figure on a Likert scale. There is a strong emphasis on the posts that the media figure makes and how those posts might influence the feelings, thoughts, and behaviors of the respondent. For example, "I experience a feeling of connectedness with the media figure through his/her posts on social media," "I often comment on the media figure's posts in the comment field," and "The media figure's posts often inspire me to make changes in my own life."

There are a few differences between the MMPR and the CAS. The former focuses on reactions to posts made by one's favorite celebrity, whereas the CAS does not. However, it is reasonable to assume that most of the favorite celebrities chosen by respondents on the CAS are on social media, given that previous research has shown that the large majority of favorite celebrities are either musicians, actors, or athletes

(Bui, 2012; Hitlan et al., 2021; McCutcheon et al., 2016), and that high CAS scores predict high scores on a measure of social media addiction (Reyes et al., 2021). There are also similarities, such as use of Likert-type scales, use of factor analysis, and some similar item content (e.g. “I experience a feeling of connectedness with the media figure through his/her posts on social media” MMPR, and “I share with my favorite celebrity a special bond that cannot be described in words” CAS). Other similar item pairs include “I often feel that I get inspired by the media figure’s posts” MMPR, and “When something good happens to my favorite celebrity I feel like it happened to me” CAS; “It often happens that I, in conversations with other people in my everyday life, point out things that the media figure has mentioned in his/her posts on social media” MMPR, and “I love to talk with others who admire my favorite celebrity” CAS). As a result of these similarities, and Williams et al. (2024) finding of a positive association between parasocial relationships and celebrity worship, our first hypothesis is that there will be a positive association between parasocial relationship and celebrity worship (i.e., scores on the MMPR and scores on the CAS).

Garcia et al., (2022) also found that parasocial relationships were associated with lower self-esteem, which was partially explained by social comparison. We sought to replicate this finding, so our second hypothesis is that MMPR scores will be associated with lower self-esteem mediated through scores on a brief measure of social comparison.

Given the similarities between the MMPR and the CAS, would a similar relationship be found if CAS was used as a measure of a parasocial relationship instead of the MMPR? In other words, would stronger admiration for one’s favorite celebrity as measured by the CAS be linked to lower self-esteem through a brief measure of social comparison as a mediator? Previous research comparing CAS scores with various measures of self-esteem have yielded mixed results. Kusuma and Yuliawati (2013) found no relationship between scores on two of the three subscales of the CAS and scores on a measure of self-esteem, but a weak negative relationship between CAS borderline pathological and self-esteem. In other words, as the tendency to endorse a dangerously pathological attachment toward one’s favorite celebrity increased, the level of self-esteem slightly decreased. Stepanyan (2019) found a weak negative relationship between total CAS scores and scores on a measure of self-esteem. Sitisari et al. (2019) found that self-esteem correlated negatively with the CAS in a sample of Indonesian fan club members. Chia and Poo (2009) also found that CAS borderline pathological scores were negatively (but weakly) related to self-esteem scores in Singaporean adolescents, but their self-comparisons with favorite celebrities were unrelated to self-esteem. Ashe et al. (2005) found that self-esteem was

positively correlated with two of the three CAS subscales in a sample from the United Kingdom, but self-esteem was unrelated to any of the CAS subscales in an American sample. Because most of the literature suggests that CAS scores are either unrelated or negatively correlated with self-esteem, our third hypothesis is that stronger admiration for one's favorite celebrity as measured by the CAS will be linked to lower self-esteem, and this association will be mediated by social comparison.

Overall, this study seeks further evidence for the applicability of the MMPR, which was developed by Garcia et al. (2022) in the framework of a pilot study. The present study aims to (1) replicate Garcia et al. (2022) by investigating the factor structure, reliability, and validity of the MMPR, based on the protocol by Garcia et al. (2022), and (2) extend the findings regarding the MMPR by testing the psychometric properties of the scale in samples from three different countries, and extending the findings to a comparative analysis between the MMPR and the CAS. The following hypotheses were proposed:

- H1. The MMPR and CAS scores will be positively associated.
- H2. Social comparison will partially mediate the association between MMPR and self-esteem.
- H3. Social comparison will partially mediate the association between CAS and self-esteem.

## METHOD

### Participants

We recruited 1004 participants from universities located in Hungary ( $N = 297$ ; 76.01% women, 22.64% men, 1.35% other,  $M_{\text{age}} = 21.69$  years,  $SD = 3.03$ , age range: 18–45), Indonesia ( $N = 409$ ; 84.08% women, 15.92% men, 0% other,  $M_{\text{age}} = 19.50$  years,  $SD = 1.42$ , age range: 18–32), and Canada ( $N = 298$ ; 61.60% women, 37.26% men, 1.14% other,  $M_{\text{age}} = 20.48$  years,  $SD = 3.87$ , age range: 18–46). Of these, 99 failed to complete one or more of the study measures ( $n_{\text{Hungary}} = 11$ ;  $n_{\text{Indonesia}} = 52$ ;  $n_{\text{Canada}} = 36$ ), and an additional 47 participants failed the validity check ( $n_{\text{Hungary}} = 1$ ;  $n_{\text{Indonesia}} = 36$ ;  $n_{\text{Canada}} = 10$ ), and were therefore removed from subsequent analyses. The final sample consisted of 858 participants of which 285 participants comprised the Hungarian sample (75.79% women, 22.81% men, 1.40% other,  $M_{\text{age}} = 21.68$  years,  $SD = 3.05$ , age range: 18–45), 321 comprised the Indonesian sample (85.05% women, 14.95% men, 0% other,  $M_{\text{age}} = 19.45$  years,  $SD = 1.25$ , age range: 18–25), and 252 comprised the Canadian sample (61.11% women, 37.70% men, 1.19% other,  $M_{\text{age}} = 20.55$  years,  $SD = 3.93$ , age range: 18–46). A minimal amount of course credit was awarded to each participant. Informed consent was obtained from all participants. Ethical approvals were gained from the Institutional Review Boards of the principal

investigators' universities. The research protocol adhered with the Declaration of Helsinki. After obtaining permission from Institutional Review Boards, we administered the four scales in random order to minimize the likelihood of systematic order bias to potential participants in Qualtrics.

### Measures

The *Multidimensional Measure of Parasocial Relationships* (MMPR) was developed to measure attitudes toward social media figures and the perception to which these media figures influence their daily lives (Garcia et al., 2022). It has 18 items, divided into four subscales (i.e., affective, behavior, cognitive, decisional). Each subscale comprises 4 items, except for the decisional dimension, which has 6 items. Sample items include "I think the media figure represents values that are important to me," and "The media person seems to be a genuine person that I would get along with in real life." Respondents use a four-point Likert scale with 1 = *Totally disagree*, 2 = *Partly disagree*, 3 = *Partly agree*, and 4 = *Totally agree*. Alphas for the total scale ranged from .85 to .93. Alphas in the present study are presented in Table 3.

The *Celebrity Attitude Scale* (CAS) consists of three subscales. *Entertainment-Social* (ES, 10 items) is reflected in agreement with items like "I love to talk with others who admire my favorite celebrity." A second level of celebrity worship is characterized by more *Intense-Personal* (IP, 9 items) feelings, defined by items like "I have frequent thoughts about my celebrity, even when I don't want to." The third level, labeled *Borderline-Pathological* (BP, 4 items), is exemplified in items like: "If I were lucky enough to meet my favorite celebrity, and he/she asked me to do something illegal as a favor I would probably do it." The response format for the CAS is a 5-point scale, ranging from 1(*strongly disagree*) to 5(*strongly agree*). High scores indicate a strong attachment to one's favorite celebrity. Previous studies have established its reliability and its convergent and external validities (e.g., Greenwood et al., 2018; Griffith et al., 2013, Hitlan et al., 2021; & see Brooks, 2018, for a review). Typical alphas for the total scale range from .84 to .94. Alpha in the present study was 0.93 in the Hungarian sample (0.87 for ES, 0.89 for IP, and 0.62 for BP), 0.91 in the Indonesian sample (0.83 for ES, 0.83 for IP, and 0.49 for BP), and 0.93 in the Canadian sample (0.87 for ES, 0.86 for IP, and 0.63 for BP).

The *Iowa-Netherlands Comparison Orientation Measure* consists of 11 items about how respondents compare themselves with others. It uses a 5-point Likert scale ranging from 1, "*strongly disagree*," to 5, "*strongly agree*" (Gibbons & Buunk, 1999). However, we used a six-item version developed by Schneider and Schupp (2014) because of the length of our

other scales. Sample items include: “I often compare how I am doing socially (e. g. social skills, popularity) with other people,” “I am not the type of person who compares often with others (reverse-scored),” and “I often try to find out what others think who face similar problems as I face.” The authors found that their short version (INCOM-S) had good reliability and both construct and discriminant validity, and was not contaminated by social desirability. High scores indicate a high level of social comparison. Alpha in the present study was 0.83 in the Hungarian sample, 0.71 in the Indonesian sample, and 0.65 in the Canadian sample.

The *Rosenberg Self-esteem Scale* (RSES) consists of 10 items (e.g., “On the whole, I am satisfied with myself” and “All in all, I am inclined to feel that I am a failure” (reverse-scored). It has been widely used and has good psychometric properties (Rosenberg, 1965). It uses a four-point Likert scale (1 = *strongly disagree*, 4 = *strongly agree*). High scores suggest a person with high self-esteem. Alpha in the present study was 0.89 in the Hungarian sample, 0.79 in the Indonesian sample, and 0.87 in the Canadian sample.

### Statistical analysis

Data analysis was conducted using SPSS 21.0 and Mplus 7.4 (Muthén & Muthén, 1998–2017). Following the protocol by Garcia et al. (2022), the present study replicates the factor analysis, correlation analysis, and mediation analysis of the original study using the MMPR. Moreover, correlations between the MMPR and CAS subscales were examined, and the proposed mediation model was also tested using the CAS to extend the findings by Garcia et al. (2022). All analyses were performed on all samples (i.e., Hungarian, Indonesian, Canadian samples) to confirm these findings.

First, first-order, second-order, and bifactor models with uncorrelated and correlated factors were tested on the MMPR with a series of confirmatory factor analyses (CFAs), as proposed by Garcia et al. (2022). A mean- and variance-adjusted weighted least squares estimator (WLSMV) was used as in Garcia et al. (2022). Goodness of fit was evaluated based on the following fit indices (Bentler, 1990; Brown, 2015): Comparative fit index (CFI;  $\geq 0.95$  for good,  $\geq 0.90$  for acceptable), the Tucker-Lewis index (TLI;  $\geq 0.95$  for good,  $\geq 0.90$  for acceptable) and the root-mean-square error of approximation (RMSEA;  $\leq 0.06$  for good,  $\leq 0.08$  for acceptable) with its 90% confidence interval.

Second, Pearson-correlations were conducted to explore associations between the MMPR and CAS subscales and total scores. Skewness ( $< 2$ ) and kurtosis ( $< 7$ ) were within the suggested threshold by Hair et al. (2010) for normal distribution across all variables across the three samples in this analysis.

Third, the mediation model proposed by Garcia et al. (2022) was tested in which social comparison (i.e., the total score of the INCOM) mediates the association between parasocial relationship (i.e., the total score of the MMPR) and self-esteem (i.e., the total score of the RSES). To extend previous findings, this model was also examined using celebrity worship (i.e., the total score of the CAS) instead of the MMPR. As total scores were used in the mediation analysis (i.e., observed variables were entered in the models) as in the study by Garcia et al. (2022), fully saturated models were performed (CFI = 1.00, TLI = 1.00, RMSEA = 0.00) using a maximum likelihood estimator with robust standard errors (MLR).

## RESULTS

### Factor structure and reliability of the MMPR

First, the factor structure of the MMPR was tested using a series of CFAs. The first-order model comprised the theoretical four dimensions including the affective, behavioral, cognitive, and decisional factors defined by the respective items, while these latent factors contributed to a higher-order factor (i.e., parasocial relationships) in the second-order model. The bifactor models allowed for the items to load on the specific factors (i.e., affective, behavioral, cognitive, and decisional factors) and also on a general factor (i.e., parasocial relationships). In the first step, a bifactor model was estimated in which correlations among the specific factors and the general factor were fixed to zero. In the second step, inter-factor correlations were allowed in the bifactor model. According to the results (Table 1), none of the proposed models fit the data in either country. However, fit indices of the bifactor models with correlated factors were close to the thresholds of acceptance. Therefore, after inspection of the modification indices, an error covariance between items A3R (“I don’t feel like I personally can relate to the content in the media figure’s posts”) and CR2 (“I don’t think that the media figure portrays himself/herself in an authentic way on social media”) were added. As a result, the bifactor model with correlated factors showed an acceptable fit for the Hungarian and the Indonesian data. Both items were reverse-scored items, which represented the media figure’s credibility in content. An additional error covariance term between items D1 (“I prefer things that the media figure is marketing [e.g., products, nutrition advice, training advice, etc.] before similar things that are marketed in other places”) and D3R (“I never buy products that the media figure is marketing or giving advice about on social media”) was added for the Canadian model. These items represented the willingness to buy products motivated by the media figure. D3R was basically the reverse of D1 in content. After adding these error covariance terms, the bifactor model with correlated factors also showed an acceptable fit to the Canadian data

(see Table 1). Factor loadings are presented in Table 2. Based on these factor loadings, the contribution of the D3R item (“I never buy products that the media figure is marketing or giving advice about on social media”) to the decisional factor and the general parasocial relationships factor across the three countries was generally low. Future studies using an exploratory statistical approach should possibly consider the exclusion of this item.

Table 1 Fit indices for the tested factor structures across countries

Model	$\chi^2$	CFI	TLI	RMSEA [90% CI]
<b>First-order</b>				
HU	555.829*	0.891	0.873	0.107 [0.098–0.116]
IND	553.719*	0.816	0.785	0.098 [0.089–0.107]
CA	437.660*	0.865	0.842	0.096 [0.086–0.106]
<b>Second-order</b>				
HU	702.191*	0.854	0.832	0.123 [0.114–0.132]
IND	693.103*	0.744	0.705	0.115 [0.106–0.123]
CA	570.521*	0.807	0.778	0.114 [0.105–0.124]
<b>Bifactor (uncorrelated factors)</b>				
HU	404.583*	0.927	0.907	0.091 [0.082–0.101]
IND	359.521*	0.890	0.860	0.079 [0.070–0.088]
CA	364.384*	0.892	0.862	0.090 [0.079–0.101]
<b>Bifactor (correlated factors)</b>				
HU	330.118*	0.945	0.926	0.082 [0.071–0.092]
IND	310.789*	0.910	0.879	0.073 [0.064–0.083]
CA	297.371*	0.919	0.891	0.080 [0.069–0.091]
<b>Bifactor with error covariances (correlated factors)</b>				
HU**	304.464*	0.951	0.934	0.077 [0.067–0.088]
IND**	269.278*	0.929	0.903	0.066 [0.056–0.076]
CA**	282.886*	0.925	0.898	0.077 [0.066–0.089]
CA***	263.174*	0.933	0.909	0.073 [0.062–0.085]

Notes.\* $p < 0.001$ ; \*\* An error covariance was added between A3R and CR2 in this model.

\*\*\* The CA appears twice because the \*\* model with one error covariance did not fit the data, and we needed to add multiple error covariates in another model (\*\*\*).

Error covariance terms were added between A3R and CR2, and D1 and D3R in this model.

HU=Hungarian dataset ( $N = 285$ ), IND = Indonesian dataset ( $N = 321$ ), CA = Canadian dataset ( $N = 252$ )

Table 2 Factor loadings for the bifactor model with correlated factors across countries

Item	Hungary ( $N = 285$ )*		Indonesia ( $N = 321$ )*		Canada ( $N = 252$ )**	
	Specific factor	General factor	Specific factor	General factor	Specific factor	General factor
A1	<b>0.58</b>	<b>0.58</b>	<b>0.58</b>	<b>0.58</b>	<b>0.58</b>	<b>0.58</b>
A2	<b>0.46</b>	<b>0.54</b>	-0.009	<b>0.17</b>	<b>0.21</b>	<b>0.29</b>
A3R	<b>0.15</b>	<b>0.17</b>	<b>0.54</b>	<b>0.52</b>	<b>0.42</b>	<b>0.52</b>
A4	0.13	<b>0.75</b>	-0.04	<b>0.70</b>	-0.15	<b>0.80</b>
B1	<b>0.56</b>	<b>0.41</b>	<b>0.52</b>	<b>0.51</b>	<b>0.31</b>	<b>0.53</b>
B2	<b>0.67</b>	0.17	<b>0.62</b>	<b>0.39</b>	<b>0.38</b>	<b>0.40</b>
B3	<b>0.54</b>	<b>0.38</b>	<b>0.40</b>	<b>0.43</b>	<b>0.45</b>	<b>0.54</b>
B4R	<b>0.52</b>	<b>-0.21</b>	<b>0.31</b>	-0.12	<b>0.50</b>	-0.04
C1	<b>0.32</b>	<b>0.75</b>	<b>0.18</b>	<b>0.61</b>	<b>0.49</b>	<b>0.60</b>
C2R	<b>0.62</b>	<b>0.24</b>	<b>0.19</b>	-0.08	<b>0.50</b>	<b>0.26</b>
C3	<b>0.49</b>	<b>0.75</b>	<b>0.50</b>	<b>0.50</b>	<b>0.50</b>	<b>0.52</b>
C4	<b>0.51</b>	<b>0.77</b>	<b>0.46</b>	<b>0.52</b>	<b>0.63</b>	<b>0.50</b>
D1	<b>0.64</b>	<b>0.43</b>	<b>0.63</b>	<b>0.46</b>	<b>0.58</b>	<b>0.56</b>
D2	<b>0.45</b>	<b>0.60</b>	-0.13	<b>0.66</b>	<b>0.21</b>	<b>0.80</b>
D3R	<b>0.50</b>	-0.02	<b>0.34</b>	<b>0.29</b>	0.07	0.13
D4	<b>0.19</b>	<b>0.81</b>	-0.06	<b>0.65</b>	<b>-0.24</b>	<b>0.72</b>
D5	<b>0.31</b>	<b>0.54</b>	0.01	<b>0.74</b>	<b>0.17</b>	<b>0.52</b>
D6	<b>0.49</b>	<b>0.62</b>	-0.06	<b>0.58</b>	<b>0.47</b>	<b>0.65</b>

Notes.\* An error covariance term was added between A3R and C2R in this model.\*\* Error covariances were added between A3R and CR2, and D1 and D3R in this model. Boldfaced factor loadings are significant at least at  $p < 0.05$ .

Further reliability indices for the bifactor structure were estimated (i.e., ECV,  $\Omega$ ,  $\Omega$  hierarchical, and H) based on the suggestions by Rodriguez et al. (2016) to gain a more complex picture of the factor structure of the MMPR. Reliability was consistently poor for the affective and behavioral dimensions of the MMPR across the three countries (see Table 3). Moreover, internal consistency was generally low for all factors on the Indonesian data. Cronbach's alphas showed good internal consistencies only for the total MMPR (range: 0.79–0.83). Reliability indices for multidimensional constructs were also calculated

(see Table 3). The factor loadings (see Table 2), explained common variance,  $\Omega$ ,  $\Omega$  hierarchical, and H values suggest that the MMPR can be considered a primarily unidimensional measure with some multidimensionality based on the Indonesian and the Canadian data. However, these values were slightly lower on the Hungarian sample. Therefore, more research is needed to confirm the essentially unidimensional structure of the Hungarian version of the MMPR, despite the satisfactory reliability of the total MMPR in the present study.

Table 3 Reliability indices & descriptive statistics for the Multi-dimensional Measure of Parasocial Relationships across countries

<b>Dimensions of the MMPR</b>				
	Affective	Behavioral	Cognitive	Decisional
<b>Mean (SD)</b>				
HU	2.52 (0.57)	1.93(0.57)	2.95(0.68)	2.34 (0.59)
IND	2.77 (0.49)	2.39 (0.58)	2.76 (0.45)	2.77 (0.46)
CA	2.52 (0.61)	2.00 (0.56)	2.90 (0.63)	2.38 (0.58)
<b><math>\alpha</math></b>				
HU	0.62	0.52	0.82	0.75
IND	0.52	0.54	0.46	0.66
CA	0.63	0.49	0.74	0.71
<b>ECV</b>				
HU	0.06	0.14	0.11	0.13
IND	0.09	0.13	0.07	0.07
CA	0.07	0.08	0.14	0.08
<b><math>\Omega</math></b>				
HU	0.73	0.72	0.89	0.84
IND	0.69	0.66	0.62	0.78
CA	0.74	0.65	0.81	0.81
<b><math>\Omega</math> hierarchical</b>				
HU	0.22	0.65	0.33	0.36
IND	0.14	0.47	0.26	0.04
CA	0.14	0.37	0.45	0.10
<b>H</b>				
HU	0.45	0.67	0.58	0.64
IND	0.48	0.56	0.40	0.45
CA	0.44	0.46	0.62	0.48

*Notes.* HU = Hungarian dataset ( $N = 285$ ), IND = Indonesian dataset ( $N = 321$ ), CA = Canada dataset ( $N = 252$ ); SD = standard deviation; ECV = explained common variance ECV,  $\Omega$ ,  $\Omega$  hierarchical, and H were calculated on bifactor models with correlated factors. Error covariance terms between A3R and C2R in the HU and IND samples, and A3R and CR2, and D1 and D3R in the Canadian sample were added to the models. Total scores for the MMPR were  $M = 9.74$ ,  $SD = 1.75$  for the Hungarian sample,  $M = 10.69$ ,  $SD = 1.46$  for the Indonesian sample, and  $M = 9.81$ ,  $SD = 1.77$  for the Canadian sample. ECV ranged between 0.56 and 0.64;  $\Omega$  values ranged from 0.89 to 0.91, H values ranged from 0.88 to 0.91, and  $\Omega$  hierarchical values were 0.73 for the Hungarian sample, 0.79 for the Indonesian sample, and 0.80 for the Canadian sample for the total MMPR.

### **Convergent Validity of the MMPR**

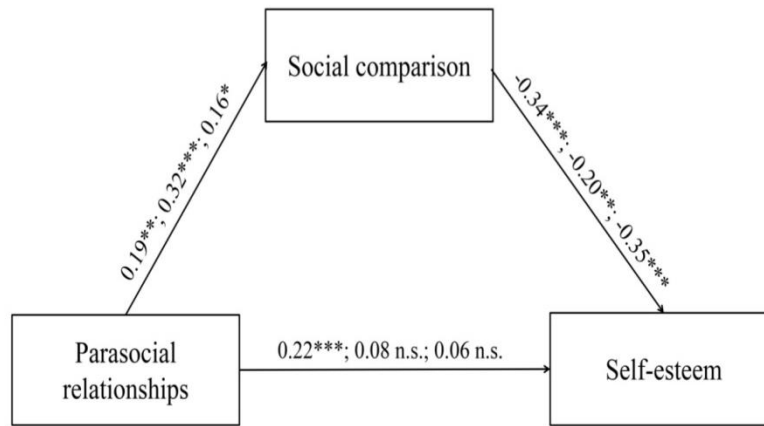
Our first hypothesis was that there would be a positive correlation between scores on the MMPR and scores on the CAS. This hypothesis was supported: Positive and moderate associations were found between the total scores of the MMPR and the CAS in all three countries ( $r$ s ranged from 0.45 to 0.59,  $p < 0.001$ ). Consistently, correlations of the affective dimension of the MMPR were positive and moderate-to-strong with the cognitive and decisional dimensions ( $r$ s ranged from 0.50 to 0.58,  $p < 0.001$ ), while all other inter-factor correlations were positive and weak-to-moderate across all countries ( $r$ s ranged from 0.13 to 0.47,  $p < 0.05$ ). The CAS subscales showed positive and strong correlations across all three countries ( $r$ s ranged from 0.63 to 0.79,  $p < 0.001$ ), except for one association: the relationship between the ES and BP dimensions were positive and moderate in the Indonesian sample ( $r = 0.56$ ,  $p < 0.001$ ).

### **Mediation models**

Our second hypothesis was that MMPR scores would be associated with lower self-esteem mediated through scores on a brief measure of social comparison as they did in Garcia et al. (2022). We ran a mediation analysis to see if social comparison mediated the relationship between total MMPR scores and self-esteem. Our results showed that stronger parasocial relationships were associated with higher social comparison tendencies, which in turn were associated with lower levels of self-esteem across all countries (see Figure 1). However, direct association between the strength of parasocial relationships and self-esteem was found only in the Hungarian sample, which was weak. Therefore, more evidence is needed to confirm the direct association between parasocial relationship, measured by the MMPR, and self-esteem. Total and total indirect effects for the model are presented in Table 4, indicating partial mediation in the Hungarian sample, and full mediation in the Indonesian and Canadian samples.

Our third hypothesis was that stronger admiration for one's favorite celebrity as measured by the total CAS scores will be linked to lower self-esteem with a brief measure of social comparison as a mediator. A similar pattern of associations showed as for the MMPR: higher celebrity worship was associated with higher social comparison tendencies, which in turn were associated with lower self-esteem in all countries (see Figure 2). However, no direct association was found between celebrity worship and self-esteem in either sample. Therefore, social comparison fully mediated the association between celebrity worship and self-esteem (see Table 4 for total and total indirect effects).

Figure 1 Mediation analysis representing the associations between the strength of parasocial relationships, social comparison, and self-esteem across countries



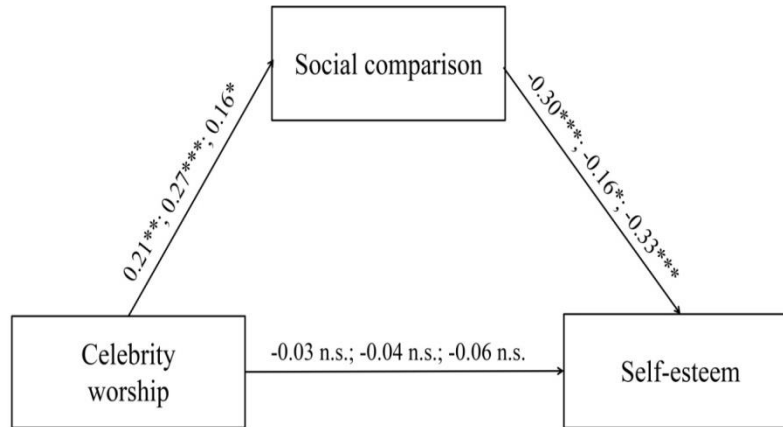
Notes.  $***p < 0.001$ ;  $**p < 0.01$ ;  $*p < 0.05$ ; n.s. = nonsignificant ( $p > 0.05$ )  
 Standardized  $\beta$  coefficients are presented on the arrows. The first values represent the coefficients estimated on the Hungarian sample ( $N = 285$ ), the second values represent coefficients for the Indonesian sample ( $N = 321$ ), while the third values indicate coefficients for the Canadian sample ( $N = 252$ ).

Table 4 Total and total indirect effects for the mediation models across countries

	Total effect $\beta$ [95% CI]	Total indirect effect $\beta$ [95% CI]
<b>Mediation with the MMPR</b>		
HU	0.15 [0.03; 0.23]*	-0.07 [-0.12; -0.02]*
IND	0.02 [-0.12; 0.16]	-0.06 [-0.11; -0.02]*
CA	0.00 [-0.34; 0.34]	-0.06 [-0.31; -0.02]*
<b>Mediation with the CAS</b>		
HU	-0.09 [-0.21; 0.02]	-0.06[-0.11; -0.02]**
IND	-0.09[-0.22; 0.05]	-0.04[-0.09; -0.002]*
CA	-0.11[-0.23; 0.01]	-0.05[-0.09; -0.01]*

Notes.  $**p < 0.01$ ;  $*p < 0.05$ ; HU = Hungarian dataset ( $N = 285$ ), IND = Indonesian dataset ( $N = 321$ ), CA = Canadian dataset ( $N = 252$ )

Figure 2 Mediation analysis representing the associations between celebrity worship, social comparison, and self-esteem across countries



*Notes.* \*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$ ; n.s. = nonsignificant ( $p > 0.05$ ) Standardized  $\beta$  coefficients are presented in the figure. The first values represent coefficients estimated using the Hungarian sample ( $N = 285$ ), the second values represent coefficients for the Indonesian sample ( $N = 321$ ), while the third values indicate  $\beta$  coefficients for the Canadian sample ( $N = 252$ ).

## DISCUSSION

Our first hypothesis was that we would find a positive correlation between the MMPR and the CAS. This hypothesis was confirmed. Furthermore, all of the four subscales of the MMPR correlated positively with all of the three subscales of the CAS in all three countries, with one exception. Most of these correlations were modest, suggesting that the MMPR and the CAS cannot be used interchangeably. However, given the overwhelming amount of validity evidence in support of the CAS, the results of our first hypothesis provides some validation for the MMPR. A very recent study conducted in the United States also found a positive correlation between the total MMPR scores and the CAS total scores. Affective subscale scores correlated positively with CAS total scores, as they did in the present study, but cognitive subscale scores did not (Williams et al., 2024). Additional research will be needed to resolve this difference.

Our second hypothesis was partially confirmed, namely that MMPR scores will be associated with lower self-esteem mediated through scores on a brief measure of social comparison. Garcia et al. (2022) found a weak significant direct relationship between the MMPR and the self-esteem measure mediated by social comparison, whereas, in the present study the direct relationship between MMPR and the self-esteem measure was non-significant in two out of the three samples. Therefore, the

present findings largely did not confirm the direct association between parasocial relationship and self-esteem, only through social comparison. More research is needed to investigate the nature of the relationship between parasocial attachment and self-esteem.

Our third hypothesis, namely that CAS scores will be associated with lower self-esteem mediated through scores on a brief measure of social comparison, was also partially confirmed. Specifically, in the present study, the direct relationship between CAS and the self-esteem measure was non-significant in all three samples. Therefore, similar to the findings in relation to the MMPR, social comparison fully mediated the association between celebrity worship and self-esteem. Results of the third hypothesis may help to explain why some of the previous attempts to directly link the CAS with self-esteem have met with findings of either no relationship or very weak ones (Ashe et al. 2005; Chia & Poo, 2009; Kusuma & Yuliawati, 2013; Stepanyan, 2019).

Similar to the study by Garcia et al. (2022), only the bifactor model with correlated factors showed an acceptable fit across the three different samples in this study. Internal consistency of the subscales was generally low, and reliability indices were good only for the total scale across the three samples. Indicators of the reliability for multidimensional constructs also suggested that the MMPR can be considered as a primarily unidimensional measure in the Indonesian and Canadian samples. However, more evidence is needed to confirm the scale's unidimensionality based on the Hungarian data. The item, "I don't feel like I personally can relate to the content of the media figure's posts" also showed modest contribution to the general and its specific factor in the bifactor model across this sample, suggesting that this item could possibly be excluded if future explorative studies confirm this finding. Supporting this notion, this item is technically the reverse of "I experience a feeling of connectedness with the media figure through his/her posts on social media," therefore, retaining only one of these items may result in a more accurate measurement without considerable information loss. However, more research is needed to confirm this result. Future studies applying an explorative approach would also be desirable to further develop the MMPR. As the primary aim of the present study was to replicate the study by Garcia et al. (2022) in order to further validate the MMPR, this study used a confirmatory, evidence-based approach for model testing; therefore, scale optimization and further development is beyond the scope of the present research, although it is warranted based on the present evidence. This study replicated the bifactor structure of the MMPR with correlating factors across three different samples. However, the measurement model of this bifactor structure was not comparable across the three samples, preventing

invariance testing, which could have allowed for cross-cultural comparison. Therefore, the MMPR may not be appropriate for cross-cultural comparisons based on the present findings, due to the inconsistency of the measurement model. Future studies optimizing the MMPR should create a measure which can be used for cross-cultural comparisons.

### Limitations

One limitation of our study is the unbalanced numbers between males and females in our sampling. Future research on this topic should address this imbalance. Because our data are correlational we cannot claim that any of the variables we studied are causally linked.

### Conclusion

In conclusion, Garcia et al. (2022) urged researchers to replicate their results in different populations. We have done that, and found that, for the most part, their findings have been replicated. The finding of a moderate correlation between total MMPR scores and total CAS scores provides evidence for the validity of the MMPR. However, further research is warranted, since the reliability of their subscales was low and no consistent factor structure was found across the three samples, which could allow for possible cross-cultural investigations. This was especially true for the Behavioral and Affective subscales. Therefore, future studies should further optimize the MMPR to reach appropriate psychometric properties and to be applicable in cross-cultural research practice. The present findings suggest that the MMPR has some limitations with regard to its consistency in the factor structure, reliability, and cross-cultural application.

### REFERENCES

- Aruguete, M., Griffith, J., Edman, J., Green, T., & McCutcheon, L. (2014). Body image and celebrity worship. *Implicit Religion, 17*(2), 223-234. Doi: 10.1558/imre.v17i2.223
- Ashe, D. D., Maltby, J., & McCutcheon, L. E. (2005). Are celebrity-worshippers more prone to narcissism? A brief report. *North American Journal of Psychology, 7*, 239-246.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238-246. <https://doi.org/10.1037/0033-2909.107.2.238>
- Brown, T. A. (2015). *Confirmatory factor analysis for applied research*. New York, NJ: Guilford Press.
- Brooks, S. K. (2018). FANatics: Systematic literature review of factors associated with celebrity worship, and suggested directions for future research. *Current Psychology*. <https://doi.org/10.1007/s12144-018-9978-4>

- Brown, Z., & Tiggemann, M. (2016). Attractive celebrity & peer images on Instagram: Effect on women's mood & body image. *Body Image, 19*, 37-43.
- Bui, N. H. (2012). False consensus in attitudes toward celebrities. *Psychology of Popular Media Culture, 1*(4), 236-242. Doi:10.1037/a0028569
- Chia, S. C., & Poo, Y. L. (2009). Media, celebrities, & fans: An examination of adolescents' media usage & involvement with entertainment celebrities. *Journalism & Mass Communication Quarterly, 86*(1), 23-44.
- Collisson, B., Browne, B. L., McCutcheon, L. E., Britt, R., & Browne, A. M. (2018). The interpersonal beginnings of fandom: The relation between attachment style, trust, & the admiration of celebrities. *Interpersona, 12*(1), 23-33. Doi: 10.5964/ijpr.v12i1.282
- Garcia, D., Bjork, E., & Kazemitabar, M. (2022). The A(ffect) B(havior) C(ognition) D(ecision) of parasocial relationships: A pilot study on the psychometric properties of the Multidimensional Measure of Parasocial Relationships (MMPR). *Heliyon, https://doi.org/10.1016/j.heliyon.2022.e10779*
- Gibbons, F. X. & Buunk, B. P. (1999). Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology, 76*(1), 129-142.
- Giles, D. C., & Maltby, J. (2004). The role of media figures in adolescent development: Relations between autonomy, attachment, and interest in celebrities. *Personality and Individual Differences, 36*, 813-822.
- Grabbe, J., McCutcheon, L. E., Johnston, M., Gillen, M. M., & Jenkins, W. J. (2022). Admiration for celebrities and belief in conspiracy theories: A brief report. *North American Journal of Psychology, 24*(3), 443-450.
- Greenwood, D., McCutcheon, L. E., Collisson, B., & Wong, M. (2018). What's fame got to do with it? Clarifying links among celebrity attitudes, fame appeal, and narcissistic subtypes. *Personality and Individual Differences, 131*, 238-243.
- Griffith, J., Aruguete, M., Edman, J., Green, T., & McCutcheon, L. E. (2013). The temporal stability of the tendency to worship celebrities. *SAGE Open, April-June, 3*, 1-5. DOI: 10.1177/2158244013494221
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Prentice-Hall.
- Hitlan, R. T., McCutcheon, L. E., Volungis, A., Joshi, A., Clark, C. B., & Pena, M. (2021). Social desirability and the Celebrity Attitude Scale. *North American Journal of Psychology, 23*(1), 105-114.
- Kusuma, L., & Yuliawati, L. (2013). Relationship between self-esteem and celebrity worship in late adolescents. *Anima, Indonesian Psychological Journal, 28*(4), 202-209.
- Maltby, J., Houran, J., Lange, R., Ashe, D., & McCutcheon, L. E. (2002). Thou shalt worship no other gods -- unless they are celebrities: the relationship between celebrity worship and religious orientation. *Personality and Individual Differences, 32*, 1157-1172. [https://doi.org/10.1016/s0191-8869\(01\)00059-9](https://doi.org/10.1016/s0191-8869(01)00059-9)
- Maltby, J. & McCutcheon, L. E. (2001). Correlations between scores on attitudes toward celebrities and authoritarianism. *Psychological Reports, 88*, 979-980. <https://doi.org/10.2466/PRO.88.4.979-980>

- Maltby, J., McCutcheon, L. E., & Lowinger, R. J. (2011). Brief report: Celebrity worshipers and the Five-factor Model of Personality, *North American Journal of Psychology*, *13*, 343-348.
- McCutcheon, L. E., & Aruguete, M. S. (2021). Is celebrity worship increasing over time? *Journal of Studies in Social Sciences and Humanities*, *7*(1), 66-75.
- McCutcheon, L. E., Aruguete, M., McCarley, N. G., & Jenkins, W. J. (2016). Further validation of an indirect measure of celebrity stalking. *Journal of Studies in Social Sciences*, *14*(1), 75-91.
- McCutcheon, L. E., Ashe, D.D., Houran, J., & Maltby, J. (2003). A cognitive profile of individuals who tend to worship celebrities. *The Journal of Psychology, Interdisciplinary and Applied*, *137*, 309-322.
- McCutcheon, L. E., Zsila, A., & Demetrovics, Z. (2021) Celebrity worship and cognitive skills revisited: applying Cattell's two-factor theory of intelligence in a cross-sectional study. *BMC Psychology*, *9*, 174. <https://doi.org/10.1186/s40359-021-00679-3>
- Muthén, L., & Muthén, B. (1998-2017). *Mplus User's Guide*. (8th ed.). Muthén & Muthén.
- Reyes, M. E., Ayuste, J. M., Cabarles, J. A., Castillo, A. L., & McCutcheon, L. E. (2021). The relationship of celebrity admiration to social media use among Filipino youth: A brief report. *North American Journal of Psychology*, *23*(3), 509-518.
- Rodriguez, A., Reise, S. P., & Haviland, M. G. (2016). Evaluating bifactor models: Calculating and interpreting statistical indices. *Psychological Methods*, *21*(2), 137-150. <https://doi.org/10.1037/met0000045>
- Rosenberg, M. (1965). *Society and the adolescent self image*. Princeton, NJ: Princeton University Press.
- Schneider, S. M., & Schupp, J. (2014). Individual differences in social comparison and its consequences for life satisfaction: Introducing a short scale of the Iowa-Netherlands Comparison Orientation measure. *Social Indicators Research*, *115*, 767-789. [Doi:10.1007/s11205-012-0227-1](https://doi.org/10.1007/s11205-012-0227-1)
- Stepanyan, A. (2019). *New media literacy: Celebrity worship, Instagram, and self-esteem*. Unpublished masters thesis, Sacramento State University.
- Sitsari, N. W., Rozali, Y. A., Arumsari, A. D., & Setyawan, D. (2019). Self-esteem and celebrity worship in social network Bollywood Mania Club members in Jakarta. *ICBCP*. [Doi:10.4108/eaf.13-2-2019.2285982](https://doi.org/10.4108/eaf.13-2-2019.2285982)
- Williams, J. L., Locker, Jr., L. L., Roberts, J. E., Abernathy, B., Johnson, A., & Mahoney, M. (2024). Brief report: Exploring the relationship between the Celebrity Attitude Scale and the Multidimensional Measure of Parasocial Relationships. *North American Journal of Psychology*, *26*(1), 231-236.

