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## **An Examination of Chen and Starosta's Model of Intercultural Sensitivity in Germany and United States**

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## **An Examination of Chen and Starosta's Model of Intercultural Sensitivity in Germany and United States**

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### **Abstract**

This study examines, via a replication study, Chen and Starosta's Model of Intercultural Sensitivity which is developed in the USA context. Although an earlier attempt to reproduce the model in Germany has been successful, the present replication study does not reach the same result based on German and US-American sample. Consequently, the intercultural validity of Chen and Starosta's Model becomes doubtful for the time being, and which demands more close examinations in future research.

Despite enormous set-backs of the worldwide economy since 2002, international business will increase in the long term. Consequently, there is a growing need of interculturally competent personnel especially in the areas of marketing and communication which strongly demand culturally sensitive ability.

As a significant dimension of intercultural competence, intercultural sensitivity has long been emphasized in business management. Among the studies, Chen and Starosta's (2000) Model of Intercultural Sensitivity is one of the models tested in different cultures. In a previous study Fritz, Möllenberg, and Chen (2002, 2003) used German sample to verify the model and found that it was basically successful, though individual aspects of the model could not be validated with the German data. In order to improve this insufficiency the present study attempts to launch a new empirical replication.

### **Literature Review**

Due to the globalizing economy, the ability of intercultural competence has become increasingly significant (Bradford, Allen, & Beisser, 1998). However, in spite of extensive research efforts have been made on the subject, neither a generally accepted definition nor an empirically validated model of intercultural competence exists (Fritz, 2001; Fritz, Möllenberg, & Werner, 1999; Müller & Gelbrich, 2001). Instead, numerous lists of capabilities, skills and

characteristics have been introduced that are regarded as important elements for intercultural interactions (Dinges & Baldwin, 1996; Kealey & Ruben, 1983).

In more recent research, intercultural competence was classified into three dimensions: affective, cognitive, and behavioral (Bennett, 2001; Chen & Starosta, 1996; Fritz, 2001; Graf, 2004a; Müller & Gelbrich, 2001; Spitzberg, 2000; Ting-Toomey, 1999). It is assumed that affective, cognitive as well as behavioral components must be developed in order to communicate efficiently and properly with individuals from different cultures. However, there is still a disagreement concerning the appropriateness of the three dimensions (Chen & Starosta 2000). Thus, a theoretically sound conceptualization of each dimension is required before a valid and reliable measurement of the overall intercultural competence can be reached (Fritz, Möllenberg, & Werner, 1999).

Chen and Starosta (1996) have intended to elaborate elements for the three dimensions of intercultural competence and to develop tools to assess the respective skills. They delineated three constructs of intercultural competence, including intercultural sensitivity, intercultural awareness and intercultural adroitness. The authors used intercultural sensitivity to conceptualize the affective component of intercultural competence. Their model of intercultural sensitivity, which is tested in this paper, includes a person's ability to receive and send positive emotional signals before, during and after intercultural interaction. These positive emotional responses will in turn lead to acknowledge and respect cultural differences.

According to Chen and Starosta (1997), intercultural sensitivity is comprised of four elements: self-concept, open-mindedness, nonjudgmental attitudes and social relaxation. In order to assess this dimension of intercultural competence, Chen and Starosta (2000) developed the Intercultural Sensitivity Scale, which was also translated into German language and empirically validated (Fritz & Möllenberg, 1999; Fritz, Möllenberg, & Chen, 2002, 2004). Chen and Starosta's Intercultural Sensitivity Scale is the only scientific survey so far assessing the emotional dimension of intercultural competence.

Chen and Starosta (1996) used intercultural awareness to define the cognitive component of intercultural competence. Intercultural awareness refers to the ability to comprehend and explain other cultures. The authors distinguished between two elements and abilities of intercultural awareness: self-awareness and cultural awareness (Chen & Starosta 1996, 1999). Chen (2000) and Kim and Chen (1995) have developed the Intercultural Awareness Scale to assess this dimension of Intercultural competence.

Intercultural adroitness represents the behavioral component of intercultural competence. It comprises the capability of an individual to get the job done and attain communication goals in intercultural interactions (Chen & Starosta, 1996). Those abilities of intercultural adroitness include message skills, interaction management, behavioral flexibility, identity management, and relationship cultivation (Chen, 2002).

The purpose of this study is to empirically replicate Chen and Starosta's Intercultural Sensitivity Scale to see if it is valid to German and US sample.

## **Method**

### **Research Design**

The data of this study were gathered by one of the authors (Graf, 2004b). In addition to the overall sample, two matched samples also were analyzed in this study. For international comparative studies non-random samples are usually recommended, because random samples

often cause difficulty in comparison due to various influences such as participants' age and level of education, and the structure of settlement (Brislin & Baumgardner, 1971; Douglas & Craig, 2000; Holzmüller, 1986; Lonner & Berry, 1986). Thus, Holzmüller (1995) recommended the use of matched samples in order to reduce the error variance. The design was adopted in this study.

### Participants

Participants in this study were selected from a medium-sized Midwestern university in the USA and a medium-sized university in Germany. The selection was based on the matching criteria, including age, level of education, study major, and the size of the university (see Table 1). In two successive semesters at both universities all students enrolled in "Management" class at the College of Master of Business Administration were included in the study. Totally 188 US and 179 German students were asked to complete the Intercultural Sensitivity Scale. Among US participants, 122 were males and 66 females; and 123 males and 56 females in German sample. The average age for US sample is 28 and 26 for German sample. Because the number of German female sample in this study is lower than the US', a t-test was conducted to check whether a gender-specific influence exists. The result did not show a significant difference.

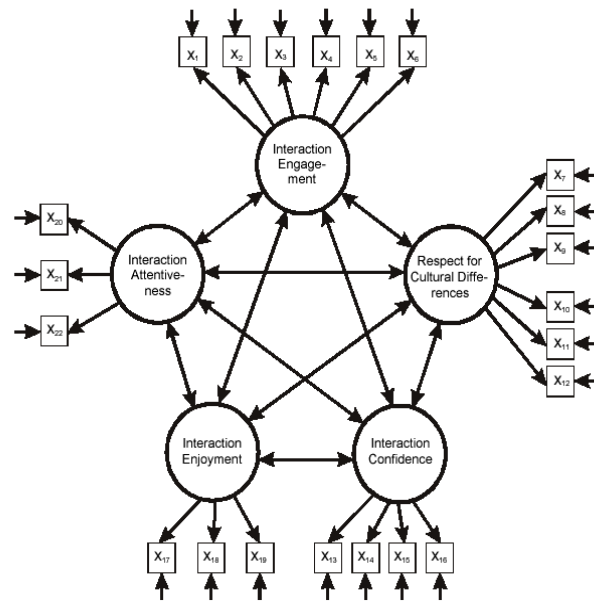
**Table 1: Data of the two partial Samples and the Population**

	Sample USA	Sample Germany	Overall Sample
Size of Sample	188	179	367
Age Average	28	26	27
Percentage of Women	66 (36.8 %)	56 (31.2 %)	131 (35.6 %)
Level of Education	final exam	Abitur (comparable to final exam)	final exam
Study Subject	MBA	MBA	MBA
Specialization	Management	Management	Management
Size of the visited University	14,300	14,500	14,400

**Instrument** Figure 1 shows the structure of Chen and Starosta's Model of Intercultural Sensitivity based on the items in the scale. The five factors, including "interaction engagement," "respect for cultural differences," "interaction confidence," "interaction enjoyment," and "interaction attentiveness," of the model were found valid in German sample (Fritz, Möllenberg, & Chen, 2002). It is assumed that the five factors of the model should be reproduced by the new sample data in this replication study. Accordingly, this study attempted to confirm the "configural invariance" which deals with reproducing the original factor-indicator relationship into a new sample without the need to exactly match the numerical form of the decisive factors (Steenkamp & Baumgartner, 1998). Table 2 shows the meaning of the indicator variables.



Figure 1: The Structure of the Chen and Starosta's Model of Intercultural Sensitivity



## DATA ANALYSIS

Because a confirmatory factor analysis based on LISREL 8 has been administered in previous studies by Fritz, Möllenberg, and Chen (2002, 2004) to verify the structure of the Model of Intercultural Sensitivity, this study followed the same procedures for the test (Fritz, 1992; Jöreskog & Sörbom, 1993; Homburg & Pflesser, 1999).

Table 2: The Meaning of Indicators

Factor	Indicator	Meaning of the Indicator
Interaction Engagement	X1	I am open-minded to people from different cultures
	X2	I often show my culturally-distinct counterpart my understanding through verbal or nonverbal cues.
	X3	I have a feeling of enjoyment towards differences between my culturally-distinct counterpart and me.
	X4	I enjoy interacting with people from different cultures.
	X5	I avoid those situations where I will have to deal with culturally-distinct persons.
	X6	I tend to wait before forming an impression of culturally-distinct counterparts.

Respect for Cultural Differences	X <sub>7</sub>	I don't like to be with people from different cultures.
	X <sub>8</sub>	I think my culture is better than other cultures.
	X <sub>9</sub>	I think people from other cultures are narrow-minded.
	X <sub>10</sub>	I respect the values of people from different cultures.
	X <sub>11</sub>	I respect the ways people from different cultures behave.
	X <sub>12</sub>	I would not accept the opinions of people from different cultures.
Interaction Confidence	X <sub>13</sub>	I am pretty sure of myself in interacting with people from different cultures.
	X <sub>14</sub>	I find it very hard to talk in front of people from different cultures.
	X <sub>15</sub>	I always know what to say when interacting with people from different cultures.
	X <sub>16</sub>	I can be as sociable as I want to be when interacting with people from different cultures.
Interaction Enjoyment	X <sub>17</sub>	I get upset easily when interacting with people from different cultures.
	X <sub>18</sub>	I often get discouraged when I am with people from different cultures.
	X <sub>19</sub>	I often feel useless when interacting with people from different cultures.
Interaction Attentiveness	X <sub>20</sub>	I try to obtain as much information as I can when interacting with people from different cultures.
	X <sub>21</sub>	I am sensitive to my culturally-distinct counterpart's subtle meanings during our interaction.
	X <sub>22</sub>	I am very observant when interacting with people from different cultures.

## Results

### For Overall Sample

Model 1, containing 22 indicators, shows the results that Chen and Starosta's Model of Intercultural Sensitivity was largely confirmed by data from German sample. Model 2, adjusted for the indicators with very low reliabilities, was also estimated. This model is based on the data of the overall sample and includes only 13 indicator variables. The results show that consistence and identification of the models need to be further examined before moving into the findings shown in Tables 3 to 5.

Regarding the consistence for both models, no nonsensical results were found and the following rule was obtained: the sample size  $n$  that should exceed the parameter  $t$  by five times was given (Bentler & Chou, 1987). The results for Model 1 is  $367/54 = 6.8$  and  $367/36 = 10.2$  for Model 2.

The results as well show that the identification is supported, because in both cases the number  $t^*$  of empirical observations (variances and covariances) exceeds the number of the estimated parameter  $t$  ( $t^* = q(q+1)/2$ , with  $q$  = number of indicators). For Model 1  $t^* =$

$253 > t = 54$ , and for Model 2  $t^* = 91 > t = 36$  applies, while the necessary prerequisite for identification is satisfied.

As to the global and local measures of fit, the results show that both models are different. However, the test of these models does not yet lead to fully satisfying results. Tables 3 to 5 show the criteria of fit for the two models. The global fit is presented in Table 5. In both models, just 6 out of 10 relevant criteria confirm the research hypothesis. Since a model cannot be accepted if one of the global fit criteria is not fulfilled, both models should be rejected based on the data in this study (Fritz, 1992). However, both comparative criteria (AIC und ECVI) show that Model 2 is slightly more preferable concerning the aspect of global adjustment (which could also depend on the smaller number of parameters).

The local model fit shows that only 7 out of 22 indicators are reliable for Model 1 and over half of the indicators do not achieve an indicator reliability of 0.4 in Model 2 (Table 3 on the next page). However, the factor reliabilities are, except for the factor of “interaction attentiveness,” basically acceptable. Nevertheless, in the average variance extracted, major adjustment problems are noticeable. Especially critical is the discriminant validity, which is evaluated according to the Fornell-Larcker criterion (Table 4 on the next pages). This criterion fails in most of the cases. The partially high intercorrelations, e.g. between the factors of “interaction engagement” and “respect for cultural differences” (0.67/0.77) are responsible for the insufficient discriminant validity.

In sum, due to the insufficient global fit, it is concluded that the data are not able to confirm Chen and Starosta’s Model of Intercultural Sensitivity. Neither the original model (Model 1) nor the alternative (Model 2) matches the criteria of the causal analysis. Nevertheless, Model 2 shows a better result according to AIC and ECVI, and thus should be a preferable one.

### **For German and US Sample**

In order to further understand the results the alternative Model was analyzed separately within the German (Model 3) and American sample (Model 4). The results show that the consistence and identification of both models seem to be warranted. Nonsensical results do not exist and the  $n/t \geq 5$ -rule is practically met, for in both cases  $n/t = 4.97$ . For both models  $t^* (= 91) > t (= 36)$  is also found.

The results in Tables 6 to 8 show an enormous lack of fit of the two models in both German and USA sample. The global fit of the German model seems to be more favorable than the American’s as AIC and ECVI demonstrate. However, three of the other global criteria are not consistent in German Model, comparing 5 out of 10 in American Model (see Table 8). The American Model seems demonstrate a better local fit than the German’s in regard to the factor reliability and the average variance extracted (see Table 6 on following pages). Moreover, in both cases the discriminant validity does not meet the Fornell-Larcker criterion (see Table 7 on following pages).

Overall, the reduced Chen and Starosta’s Model of Intercultural Sensitivity is unable to be sufficiently reproduced in both American and German sample.



**Table 3: Measures of Reliability and Validity for Models 1 and 2**

(Note: The underlined values fail to meet the requirements)

Factor	Indicator	Indicat or Reliability		Factor Reliability		Average Variance Extracted	
		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Interaction Engagement	x <sub>1</sub>	.52	.54	.77	.75	<u>.30</u>	.50
	x <sub>2</sub>	<u>.01</u>	•				
	x <sub>3</sub>	.49	.49				
	x <sub>4</sub>	.46	.48				
	x <sub>5</sub>	<u>.10</u>	•				
	x <sub>6</sub>	<u>.24</u>	•				
Respect for Cultural Differences	x <sub>7</sub>	<u>.33</u>	<u>.30</u>	.70	<u>.59</u>	<u>.32</u>	<u>.32</u>
	x <sub>8</sub>	<u>.28</u>	<u>.32</u>				
	x <sub>9</sub>	<u>.20</u>	•				
	x <sub>10</sub>	<u>.25</u>	•				
	x <sub>11</sub>	.40	<u>.33</u>				
	x <sub>12</sub>	.48	•				
Interaction Confidence	x <sub>13</sub>	.48	<u>.37</u>	.61	<u>.50</u>	<u>.29</u>	<u>.33</u>
	x <sub>14</sub>	<u>.16</u>	•				
	x <sub>15</sub>	<u>.22</u>	•				
	x <sub>16</sub>	<u>.29</u>	<u>.30</u>				
Interaction Enjoyment	x <sub>17</sub>	<u>.30</u>	<u>.30</u>	.64	.64	<u>.37</u>	<u>.37</u>
	x <sub>18</sub>	.48	.46				
	x <sub>19</sub>	<u>.34</u>	<u>.35</u>				
Interaction Attentiveness	x <sub>20</sub>	<u>.30</u>	<u>.32</u>	<u>.51</u>	<u>.51</u>	<u>.26</u>	<u>.35</u>
	x <sub>21</sub>	<u>.28</u>	<u>.38</u>				
	x <sub>22</sub>	<u>.21</u>	•				
Requirement		≥ .40	≥ .40	≥ .60	≥ .60	≥ .40	≥ .40

**Table 4: Analyses of the Discriminant Validity in Model 1 and Model 2**

		Interaction Engagement	Respect for Cultural Differences	Interaction Confidenc e	Interaction Enjoyment	Interaction Attentiveness
Interaction Engagement	$\rho = .30/.50$	•	$\varphi^2 = \underline{.67/.77}$	$\varphi^2 = \underline{.46/.66}$	$\varphi^2 = \underline{.58/.58}$	$\varphi^2 = \underline{.56/.37}$
Respect for Cultural Differences	$\rho = .32/.32$	$\varphi^2 = \underline{.67/.77}$	•	$\varphi^2 = .12/.26$	$\varphi^2 = \underline{.49/.56}$	$\varphi^2 = .22/.15$
Interaction Confidence	$\rho = .29/.33$	$\varphi^2 = \underline{.46/.66}$	$\varphi^2 = .12/.26$	•	$\varphi^2 = \underline{.32/.38}$	$\varphi^2 = .24/.21$
Interaction Enjoyment	$\rho = .37/.37$	$\varphi^2 = \underline{.58/.58}$	$\varphi^2 = \underline{.49/.56}$	$\varphi^2 = .32/.38$	•	$\varphi^2 = .28/.20$
Interaction Attentiveness	$\rho = .26/.35$	$\varphi^2 = \underline{.56/.37}$	$\varphi^2 = .22/.15$	$\varphi^2 = .24/.21$	$\varphi^2 = \underline{.28/.20}$	•

(Note:  $\rho$  = average variance extracted;

$\phi^2$  = Square of the correlation between two factors;  
the first value refers to model 1, the 2<sup>nd</sup> refers to model 2  
Fornell-Larcker criterion:  $\rho > \phi^2$ ;  
underlined values fail to meet the requirements.)

**Table 5: Empirical Model Comparison**

Measures of Fit	Requirement	Model 1	Model 2
a) Global Adjustment			
$\chi^2/\text{df}$	$\leq 2.50$	1.84	2.50
RMSEA	$\leq .050$	.04	<u>.06</u>
GFI	$\geq .90$	.92	.95
AGFI	$\geq .90$	<u>.89</u>	.91
RMR	$< .10$	.03	.03
NFI	$\geq .90$	<u>.80</u>	<u>.88</u>
NNFI	$\geq .90$	<u>.88</u>	<u>.89</u>
RFI	$\geq .90$	<u>.77</u>	<u>.84</u>
IFI	$\geq .90$	.90	.93
CFI	$\geq .90$	.90	.93
AIC	min	474.67	209.92
ECVI	min	1.30	.57
b) Local Fit			
		(Average)	
Indicator Reliability	$\geq .40$	<u>.31</u>	<u>.38</u>
Factor Reliability ( $\rho_c$ )	$\geq .60$	.65	.60
Average Variance Extracted ( $\rho_v$ )	$\geq .40$	<u>.31</u>	<u>.37</u>
Convergent Validity Given			
if $\rho_c$	$\geq .60$	.65	.60
if $\rho_v$	$\geq .50$	<u>.31</u>	<u>.37</u>
Discriminant Validity (Fornell/Larcker criterion)	$\rho_{\bar{v}_i} > \phi_{ij}^2$	<u>.31 &lt; .39</u>	<u>.37 &lt; .41</u>

(Note: underlined values fail to meet the requirements)

**Table 6: Measures of Reliability and Validity for Models 3 (German) and 4 (USA)**

Factor	Indicator	Indicator Reliability		Factor reliability		Average Variance Extracted	
		Model 3	Model 4	Model 3	Model 4	Model 3	Model 4
Interaction	$x_1$	.55	.50	.77	.73	.53	.48

Engagement	x <sub>2</sub>	•	•		
	x <sub>3</sub>	.50	.49		
	x <sub>4</sub>	.53	.44		
	x <sub>5</sub>	•	•		
	x <sub>6</sub>	•	•		
Respect for Cultural Differences	x <sub>7</sub>	<u>.38</u>	<u>.23</u>		
	x <sub>8</sub>	<u>.24</u>	.55		
	x <sub>9</sub>	•	•	.56	.64
	x <sub>10</sub>	•	•		<u>.30</u> <u>.38</u>
	x <sub>11</sub>	<u>.28</u>	<u>.36</u>		
	x <sub>12</sub>	•	•		
Interaction Confidence	x <sub>13</sub>	<u>.23</u>	<u>.57</u>		
	x <sub>14</sub>	•	•		
	x <sub>15</sub>	•	•	.38	.63
	x <sub>16</sub>	<u>.24</u>	<u>.36</u>		<u>.24</u> .47
Interaction Enjoyment	x <sub>17</sub>	<u>.20</u>	<u>.35</u>		
	x <sub>18</sub>	<u>.33</u>	.54	.49	.71
	x <sub>19</sub>	<u>.21</u>	.46		<u>.25</u> .45
Interaction Attentiveness	x <sub>20</sub>	<u>.27</u>	<u>.29</u>		
	x <sub>21</sub>	.49	<u>.34</u>	.55	.48
	x <sub>22</sub>	•	•		<u>.38</u> <u>.31</u>
Requirement		≥ .40	≥ .40	≥ .60 ≥ .60	≥ .40 ≥ .40

(Note: underlined values fail to meet the requirements)

**Table 7: Analysis of the Discriminant Validity in Model 3 (German) and Model 4 (US)**

		Interaction Engagement	Respect for Cultural Differences	Interaction Confidence	Interaction Enjoyment	Interaction Attentiveness
Interaction Engagement	$\rho = .53/.48$	•	$\varphi^2 = \underline{.66}/.98$	$\varphi^2 = \underline{.61}/.69$	$\varphi^2 = \underline{.56}/.79$	$\varphi^2 = .14/.84$
Respect for Cultural Differences	$\rho = .30/.38$	$\varphi^2 = \underline{.66}/.98$	•	$\varphi^2 = .24/.35$	$\varphi^2 = \underline{.45}/.79$	$\varphi^2 = .00/.62$
Interaction Confidence	$\rho = .24/.47$	$\varphi^2 = \underline{.61}/.69$	$\varphi^2 = \underline{.24}/.35$	•	$\varphi^2 = \underline{.98}/.26$	$\varphi^2 = .09/.30$
Interaction Enjoyment	$\rho = .25/.45$	$\varphi^2 = \underline{.56}/.79$	$\varphi^2 = \underline{.45}/.79$	$\varphi^2 = \underline{.98}/.26$	•	$\varphi^2 = .02/.53$
Interaction Attentiveness	$\rho = .38/.31$	$\varphi^2 = .14/.84$	$\varphi^2 = .00/.62$	$\varphi^2 = .09/.30$	$\varphi^2 = \underline{.02}/.53$	•

(Note:  $\rho$  = average variance extracted;  
 $\varphi^2$  = Square of the correlation between two factors;  
the first value refers to model 1, the 2<sup>nd</sup> refers to model 2  
Fornell-Larcker criterion:  $\rho > \varphi^2$ ;  
underlined values fail to meet the requirements.)

**Table 8: Empirical Model Comparison**

Measures of Fit	Requirement	Model 3 (Germany)	Model 4 (USA)
a) Global Fit			
$\chi^2/df$	$\leq 2.50$	1.50	2.03
RMSEA	$\leq .050$	.05	<u>.07</u>
GFI	$\geq .90$	.93	.92
AGFI	$\geq .90$	<u>.89</u>	<u>.86</u>
RMR	$< .10$	.04	.03
NFI	$\geq .90$	<u>.84</u>	<u>.86</u>
NNFI	$\geq .90$	.91	<u>.89</u>
RFI	$\geq .90$	<u>.77</u>	<u>.81</u>
IFI	$\geq .90$	.94	.93
CFI	$\geq .90$	.93	.92
AIC	min	154.70	183.97
ECVI	min	.87	1.03
Local Fit		(Average)	
Indicator Reliability	$\geq .40$	<u>.34</u>	.42
Factor Reliability ( $\rho_c$ )	$\geq .60$	<u>.55</u>	.64
Average Variance Extracted ( $\rho_v$ )	$\geq .40$	<u>.34</u>	.42
Convergent Validity Given			
if $\rho_c$	$\geq .60$	<u>.55</u>	.64
if $\rho_v$	$\geq .50$	<u>.34</u>	<u>.42</u>
Discriminant Validity (Fornell/Larcker criterion)	$\rho_{v_i} > \phi_{ij}^2$	<u>.34 &lt; .37</u>	<u>.42 &lt; .61</u>

(Note: underlined values fail to meet the requirements)

### Discussion

In a nutshell, the results in this study did not sufficiently verify the five-factor structure of Chen and Starosta's Model of Intercultural Sensitivity. The results applied to the original model with 22 indicators (Model 1) and the reduced alternative Model with 13 indicators (Model 2), based on the data of the overall sample as well as to the reduced model that has been examined separately with American and German sample (Model 3 and Model 4). Regarding the different analyses, the basic requirements of global and local model fit of the LISREL models have been met only with 33% to 70%. Examining all the used fit criteria, a share of not-met requirements are ranging from 53% to 60% in the four models. (see Table 9).

**Table 9: The Falsification Quota of the Models**

Model	Not-met requirements		
	Global Criteria	Local Criteria	All Criteria
Model 1	40 %	64 %	60 %
Model 2	40 %	63 %	58 %
Model 3	30 %	67 %	60 %
Model 4	50 %	54 %	53 %

It needs to be pointed out that the sample used in this study differs from those in Chen and Starosta's and Fritz, Möllenberg, and Chen's. While previous studies had over 400 more participants separately, the sample in this study mixes German and American participants. However, though the sample size in this study seems to be sufficient for the necessary analyses, it still cannot guarantee that the results would be the same as the double sample size in previous studies, because, according to Bentler and Chou (1987), parameter estimates and model behavior are often directly influenced by the sample size. In addition, analyses of three of the four models are based on the five-factor Model of Intercultural Sensitivity extracted from multiple indicators, this reduction of indicators might negatively affect some factors of local fit in terms of factor reliability and average variance. Despite all these possible limitations, the findings in this study raise some reasonable doubts on the validity of Chen and Starosta's Model of Intercultural Sensitivity.

Finally, while the present study raises doubts, more studies in future research are needed to further validate Chen and Starosta's Model of Intercultural Sensitivity in international contexts, especially for participants from non-Western cultures.

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