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DISCOVERY AND EXPLOITATION OF HISTORY: LAY THEORIES OF
HISTORY AND THEIR CONNECTIONS TO NATIONAL IDENTITY AND
INTEREST IN HISTORY. MEMORY STUDIES.

Supplementary Materials

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1 TESTING THE INTERNAL RELIABILITY OF THE LAY THEORIES OF HISTORY SCALE

The Lay Theories of History Scale (LTHS) 's reliability, and inner structure were tested in three major steps (please see Table 1 for the sample details). In the 1st step, we conducted an exploratory study on the representative sample of the Polish city Oswiecim. This early version of the scale contained eight items. In the 2nd step, we tested the scale on two representative samples of Polish citizens using the CAWI methodology. In this step, we have used 14 items to select the best item for the final version of the scale. In the 3rd and final step, we tested the ninth item version of the scale on a huge sample of Polish citizens from 6 Polish cities. The sample was representative on a city level. While the first two steps were based on the exploratory approach, the last step was confirmatory, and it allowed to analyze whether the factorial structure holds.

Table 1 The basic statistics of samples used for the validation of LTHS.

Study:	Sample type	N	<i>M</i> _{age} (<i>SD</i>)	No of items	% women
1	Oświęcim ^b	549	38.07 (16.43)	8	59.8
2	CAWI ^a	500	35.02 (13.23)	14	50.7
3	CAWI ^a	500	34.47 (13.54)	14	51.2
4	Six Polish cities ^c	2430		9	
	6C: Białystok	410	44.94 (16.39)		53.7
	6C: Kraków	414	45.83 (17.05)		53.9
	6C: Łódź	400	48.33 (17.41)		55.8
	6C: Olsztyn	402	44.73 (16.78)		54.2
	6C: Poznań	401	45.40 (16.22)		54.4
	6C: Wrocław	401	46.14 (17.74)		53.9

Notes: ^a – Computer Assisted Web Interview – a quota (gender, age, education) representative sample of Polish internet users; ^b – a quota representative sample of Oswiecim dwellers; ^c – quota representative samples of six cities

Regardless of the study and step, we have consequently received a three-factor structure of the scale as described in the original work:

- 1) Historical realism – is a set of beliefs congruent with the normative approach to history and the belief that the central aim of history should be to discover the truth about past events. The exemplary items are: *In history, the most important thing is to know the truth about the past; We should even remember those historical events which today may give rise to conflicts and disputes*
- 2) Historical instrumentalism – a set of beliefs that legitimizes the distortion of history if used to justify a national in-group's current actions. The exemplary items are: *Sometimes, it is better to remain silent about certain historical events in order not to weaken the image of our nation; The knowledge of the past should be communicated in such a way that it serves the interests of our nation today.*
- 3) Historical relativism – is a set of beliefs that treat history as something that may never fully be understood and known. The exemplary items: *The past can never be fully understood; We will never know the real course of many historical events.*

At the end of Supplementary Materials, we include the final nine items version of the scale.

2 TESTING THE INITIAL VERSION OF THE SCALE.

The first research using the initial version of the LTHS was conducted in 2011 on a representative sample of the Polish city Oswiecim citizens. The research was conducted with a local NGO – Auschwitz Jewish Center.

To test the factorial structure of LTHS, we have used Exploratory Structural Equation Modelling – ESEM (Asparouhov and Muthén 2009; Marsh et al. 2009; 2014). This technique combines the confirmatory and exploratory approach to factor analysis as it allows items to be partially loaded by several latent variables simultaneously. This approach is treated as more realistic than restrictive presumptions of Confirmatory Factor Analysis.

The results suggested that the three-factor model fit the data better than a single or two-factor model (see Table 2 for details) and obtained satisfying overall fit indices (Hu and Bentler 1999; Chen 2007).

Table 2 Fit indices of ESEM for the initial version of the scale – Oswiecim Study

Model:	df	Chi ²	Chi2/df	RMSEA ^a	Δ Chi ² ^b
1 factor	20	336.497*	16.82	.17 (.15, .19)	-
2 factors	13	104.913*	8.07	.11 (.09, .13)	p < .001
3 factors	7	10.187	1.46	.03 (.00, .07)	p < .001

Notes: ^a – with 90% confidence intervals; ^b – significant change is a sign of better overall fit of a more complex model.

In Table 3, we present factor loadings for the EFA analysis with the Varimax rotation. The three identified factors accounted for 61.8% of the total variance. The 1st factor was interpreted as Historical Instrumentalism. The 2nd factor was interpreted as Historical Relativism and the third one as Historical Realism. The factor loadings of items that loaded primarily on a specific factor are bolded.

Table 3 Standardized factor coefficients for the Exploratory Factor Analysis - Varimax Rotation

Item	Factor		
	1	2	3
History is always written by the victors.	.26	.67	.10
There is no historical truth.	-.01	.81	-.13
We will never know the actual course of many historical events.	.00	.81	-.05
He truth about majority of historical events may be discovered.	.25	-.06	.75
The knowledge about the past should be communicated in a way that serves currents interests of our nations.	.80	.11	.16
The history should serve the current interests of our nation, it is more important than historical truth.	.85	.11	.09
Sometimes it is better not to talk about some historical events, so they cannot damage our country's image.	.78	.00	-.30
We should discuss even those historical events that may damage our country's image.	-.44	-.04	.68

3 TESTING THE EXTENDED VERSION OF LTHS

We decided to expand the initial items pool to balance the number of items across factors in the second step. We have conducted two studies (CAWI 1 & 2) on representative Polish samples using an internet panel. We have extended the initial items pool to 14. As previously,

we have started with the ESEM analysis for two studies separately. The results are presented in Table 4. The global fit indices suggested that the three-factors model fits data better in both cases. It also achieved satisfying global fit indices.

Table 4 Fit indices of ESEM for an extended version of the scale – CAWI 1 & CAWI 2

Model:	df	Chi ²	Chi2/df	RMSEA ^a	Δ Chi ² ^b	CFI	SRMR
CAWI 1							
2 factors	64	442.733*	6.92	.11 (.10, .12)	-	.82	.07
3 factors	52	169.230*	3.25	.07 (.06, .09)	p < .001	.95	.03
CAWI 2							
2 factors	64	402.693*	6.29	.10 (.09, .13)	-	.84	.06
3 factors	52	159.864*	3.07	.06 (.05, .08)	p < .001	.95	.03

Notes: ^a – with 90% confidence intervals; ^b – significant change is a sign of better overall fit of more complex model.

In Table 5, we present standardized factor loadings for specific scale items. As previously, the 1st factor was interpreted as Historical Instrumentalism. The 2nd factor was interpreted as Historical Relativism and the third one as Historical Realism. The factor loadings of items that loaded primarily on a specific factor are bolded.

Table 5 Standardized factor loadings using orthogonal rotation Geomin for the CAWI 1 & CAWI 2

Item:	Factor 1		Factor 2		Factor 3		% variance	
	S1	S2	S1	S2	S1	S2	S1	S2
1. The history should serve the current interests of our nation, it is more important than historical truth.	.77	.72	.19	.33	-.06	-.22	.64	.67
2. The knowledge about the past should be communicated in a way that serves currents interests of our nations.	.68	.64	.11	.30	.01	.05	.47	.50
3. Sometimes it is better not to talk about some historical events, so they cannot damage our country's image.	.45	.40	.37	.30	-.31	-.46	.43	.47
4. History is always written by the victors.	.30	.09	.32	.35	.06	.00	.19	.13
5. There is no historical truth.	.09	.08	.65	.62	.03	.05	.44	.40
6. We will never know the actual course of many historical events.	.12	-.02	.59	.67	.28	.18	.44	.48
7. The past can never be fully understood.	-.01	-.01	.57	.65	.07	.07	.33	.43
8. There is no single truth in history. Every event may be described from many different perspectives.	.00	.01	.60	.63	.31	.34	.45	.51
9. The history is too complicated to be fully understood.	.09	.06	.59	.57	.01	-.01	.36	.33
10. The truth about the majority of the historical events may never be discovered.	.26	.21	.04	-.03	.47	.43	.29	.23
11. We should discuss even those historical events that may damage our country's image.	-.06	-.22	.09	.03	.77	.67	.60	.50
12. In history, the most important thing is to know the truth about the past.	.09	.13	-.04	.01	.68	.59	.47	.36
13. We should commemorate even those historical events which today may give rise to conflicts and disputes	-.01	.02	.07	.06	.79	.82	.62	.67
14. Historians should explore the past even though their findings may cause disputes or conflicts.	-.02	-.03	.07	.03	.81	.80	.67	.65

Notes: S1 – Study CAWI 1; S2 – Study CAWI 2; ^a – procent wariacji wyjaśnianej przez zmienne latentne dla poszczególnych wskaźników

4 THE FINAL VERSION OF LTHS

The final version of the scale was validated in a research conducted on six independent samples of citizens of Polish cities. The samples were representative on a city level. We have used selected items taken from studies CAWI 1 & CAWI 2 by selecting three items with the highest standardized factor loadings per factor. As previously, we have used the ESEM modelling, but to cope with the clustered nature of the data, we used its multi-group extension. Additionally, we have assumed that: (1) the scale will consist of three independent factors; (2) that the scale will have similar properties in all six samples, and that metric invariance will be obtained (Davidov et al. 2013). The results confirmed our assumption as the global fit indices were more than satisfying: $\chi^2(162) = 299.06$, ($p < .001$); $\chi^2/df = 1.85$; RMSEA = .05 (.04; .05); CFI = .96; SRMR = .05.

In Table 6, we present standardized factor loadings for specific scale items. The 1st factor was interpreted as Historical Instrumentalism. The 2nd factor was interpreted as Historical Realism, and the third one as Historical Relativism. The factor loading of items that loaded primarily on a specific factor are bolded.

Table 6 Standardized factor loadings using orthogonal rotation Geomin for the 6C study.

	Factor		
	1	2	3
The history should serve the current interests of our nation, it is more important than historical truth.	.65	-.03	-.03
The past can never be fully understood.	.19	-.03	.47
The truth about the majority of the historical events may never be discovered.	.22	.25	.55
The knowledge about the past should be communicated in a way that serves current interests of our nations.	.71	.12	.00
Historians should explore the past even though their findings may cause disputes or conflicts.	.00	.69	.08
Sometimes it is better not to talk about some historical events, so they cannot damage our country's image.	.54	-.30	.17

In history, the most important thing is to know the truth about the past.	-01	.68	.05
The history is too complicated to be fully understood.	.28	.01	.43
We should commemorate even those historical events which today may give rise to conflicts and disputes	-.03	.55	.04

The final study confirmed our previous results and allowed us to formulate the final version of LTHS as presented below:

Historical Instrumentalism:

The history should serve the current interests of our nation, it is more important than historical truth.

The knowledge about the past should be communicated in a way that serves currents interests of our nations.

Sometimes it is better not to talk about some historical events, so they cannot damage our country's image.

Historical Relativism:

The past can never be fully understood.

The truth about the majority of the historical events may never be discovered.

The history is too complicated to be fully understood.

Historical Realism:

Historians should explore the past even though their findings may cause disputes or conflicts

In history, the most important thing is to know the truth about the past.

We should commemorate even those historical events which today may give rise to conflicts and disputes

5 ADDITIONAL ANALYSES FOR THE CONNECTION BETWEEN LTH AND NATIONAL IDENTIFICATION

Additionally, we expanded this analysis with a regression model for the 6C Study, where we have tested in-group attachment and glorification as simultaneous predictors of LTHs.

Because both forms of identity share common variance, it was probable that the connections between LTHs and different forms of national identity will accentuate. The results are presented in Table 7.

Congruently with initial hypotheses, Historical Instrumentalism was predicted only by in-group glorification. In contrast, Historical Realism was predicted positively by in-group attachment but negatively by in-group glorification.

Table 7

The regression results for six cities study of three types of lay theories of history on measures of national identification with 95% bootstrapped confidence intervals.

	Instrumentalism		Realism		Relativism	
	<i>B</i> (<i>CI</i> _{min} ; <i>CI</i> _{max})	<i>B</i>	<i>B</i> (<i>CI</i> _{min} ; <i>CI</i> _{max})	<i>B</i>	<i>B</i> (<i>CI</i> _{min} ; <i>CI</i> _{max})	<i>β</i>
Glorification	0.15 (0.12; 0.41)	.29***	-0.17 (-0.29; -0.08)	-.20**	-0.03 (-0.15; 0.12)	- .04
Attachment	0.06 (-0.12; 0.17)	.06	0.47 (0.37; 0.55)	.49***	0.12 (-0.07; 0.21)	.15
R ²	.10*		.18***		.02	

Notes: ** p < .01; *** p < .001

6 ADDITIONAL ANALYSES FOR THE CONNECTION BETWEEN LTH AND INTEREST IN HISTORY

Additionally, we expanded this analysis with a regression model where we have tested interest in history and focus on the present as simultaneous predictors of LTHs. Because both forms of historical interest share a common variance (they are negatively correlated), it was probable that the connections between LTHs and different forms of national identity will accentuate. The results are presented in Table 7.

Table 8.

The regression results of three lay theories of history on the measures of interest in history for six cities study with 95% bootstrapped confidence intervals.

	Instrumentalism		Realism		Relativism	
	<i>B</i> (<i>CI</i> _{min} ; <i>CI</i> _{max})	β	<i>B</i> (<i>CI</i> _{min} ; <i>CI</i> _{max})	<i>B</i>	<i>B</i> (<i>CI</i> _{min} ; <i>CI</i> _{max})	β
Interest in History	0.11 (0.04; 0.19)	.11**	0.18 (0.06; - 0.26)	.20**	0.10 (0.03; 0.15)	.12**
Focus on the present	0.40 (0.32; 0.51)	.37***	-0.16 (-0.20; - 0.09)	- .16***	0.16 (0.09; 0.15)	.20***
R^2	.14**		.07*		.05*	

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$

References:

- Asparouhov, Tihomir, and Bengt Muthén. 2009. "Exploratory Structural Equation Modeling." *Structural Equation Modeling: A Multidisciplinary Journal* 16 (3): 397–438. <https://doi.org/10.1080/10705510903008204>.
- Chen, Fang. 2007. "Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance." *Structural Equation Modeling* 14 (3): 464–504. <https://doi.org/Article>.
- Davidov, Eldad, Bart Meuleman, Jan Cieciuch, Peter Schmidt, and Jaak Billiet. 2013. "Measurement Equivalence in Cross-National Research." *Annual Review of Sociology*, July. <https://doi.org/10.1146/annurev-soc-071913-043137>.
- Hu, Li-tze, and Peter M. Bentler. 1999. "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives." *Structural Equation Modeling: A Multidisciplinary Journal* 6 (1): 1–55. <https://doi.org/10.1080/10705519909540118>.
- Marsh, Herbert W., Alexandre J.S. Morin, Philip D. Parker, and Gurvinder Kaur. 2014. "Exploratory Structural Equation Modeling: An Integration of the Best Features of Exploratory and Confirmatory Factor Analysis." *Annual Review of Clinical Psychology* 10 (1): 85–110. <https://doi.org/10.1146/annurev-clinpsy-032813-153700>.
- Marsh, Herbert W., Bengt Muthén, Tihomir Asparouhov, Oliver Lüdtke, Alexander Robitzsch, Alexandre J. S. Morin, and Ulrich Trautwein. 2009. "Exploratory Structural Equation Modeling, Integrating CFA and EFA: Application to Students' Evaluations of University Teaching." *Structural Equation Modeling: A Multidisciplinary Journal* 16 (3): 439–76. <https://doi.org/10.1080/10705510903008220>.