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An index of relative deprivation for children under 12 years of age

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Relevance

- Relative deprivation:
 - Concept for measuring poverty = lack of resources to obtain the activities and living conditions that are "*widely encouraged and approved, in the society to which they belong*"
(Townsend, 1979: p. 31)
 - Focus on multidimensionality of poverty instead of income distribution
 - EU: poverty as a lack of income and resources precluding people "*from having a standard of living considered acceptable in the society in which they live*"
(Council of the European Communities, 1985)

Relevance

- Recent studies:
 - Apply multidimensional concept
(Dotto et al., 2019; Dudek & Szczesny, 2021)
 - Compare adults, households, or regions, often referring to the EU-SILC dataset
(e.g., Blatná, 2017; Dudek, 2019; Israel & Spannagel, 2019; Kis & Gábos, 2016; Łuczak & Kalinowski, 2020; Šoltés & Ulman, 2015; Whelan & Maître, 2012)
 - Relative deprivation of children is less in focus
 - Exception: MODA-tool by UNICEF
(Chzhen et al., 2014)

Relevance

- Aims:
 1. Compare children according to what extent they are deprived
 2. Differing living conditions of deprived children

Theory

- Living conditions according to welfare literature as potential to realize aspirations and gain subjective satisfaction:
 (Erikson, 1974; Lane, 1994)
 - Health
 - Skills/knowledge
 - Financial resources
 - Political Influence
 - Working and living environment (residency, leisure)
 - Services, public infrastructure, justice, safety/security
 - Fellowship

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Individual

Household

Regional
infrastructure

Theory

- Living conditions according to welfare literature as potential to realize aspirations and gain subjective satisfaction:
(Erikson, 1974; Lane, 1994)
 - Children with ...
 - lower (1) economic, (2) educative, (3) supportive/social, and (4) health resources on an (a) individual, (b) household-related, and (c) regional level ...
 - more and younger siblings ...
 - ... have a higher risk to live in materially deprived circumstances
- No differences between children with and without migration background, or with one and two parents ceteris paribus

Data

- AID:A 2019 main sample: random household sample (CAPI) of German population under 32 years of age
(Kuger et al., 2020)
- Household reference persons (regularly mothers) assessed financial restrictions in the activities and living conditions of every child under the age of 12 (N = 3690) living in the household (N = 2215)
- Household design weights with calibration according education
- Household live in regions (N = 180) → regional statistics available from INKAR database
(German Federal Institute for Research in Building, Urban Affairs, and Spatial Development)

Analysis – Step 1

- "Counting Approach" counts the number of deprivations present and then compares different degrees of relative deprivation
(Atkinson, 2003; Dudek, 2019; Najera Catalan, 2017)
- Ward Cluster Analysis: classify children into different types of relative deprivation
- Selection of 4-Cluster solution according to similarity values

Results – Step 1

Table 1: Ward Cluster Solution of Deprived Children under 12 Years of Age

Item	Cluster				Total
	1 no vacation	2 used clothes & no vacation	3 restricted nutrition & activities	4 leisure restrictions & no vacation	
Indoor toys	0%	4%	2%	0%	0%
A high-quality meal once a day	0%	1%	7%	0%	0%
Fresh fruits and vegetables once a day	0%	1%	8%	0%	0%
Birthday parties etc.	0%	1%	8%	0%	0%
Three meals a day	0%	0%	12%	0%	0%
Outdoor toys	0%	1%	13%	4%	0%
Two pairs of matching shoes	3%	9%	4%	1%	0%
Invite friends	0%	3%	24%	3%	0%
Age-appropriate books in the house	0%	4%	2%	33%	1%
New, unused clothing	0%	100%	3%	4%	2%
Regular leisure activity	0%	18%	53%	82%	2%
At least one week vacation	99%	47%	27%	91%	11%
N	453	77	95	76	701
Avg. count of deprivations	1.0	1.9	1.6	2.2	1.3

Analysis – Step 2

- Multinomial logistic regression models: estimate each child's probability of being assigned to each type
- Reference category of dependent variable: “not deprived”
- Independent variables:
 - Child characteristics
(e.g., age, birth order, gender, migration background, health)
 - Household characteristics
(e.g., income, occupation, education, social support from family/friends/neighbors)
 - Regional characteristics → latent factors (EFA)
(e.g., urbanization, labor market, demography)

Analysis – Step 2

- Multinomial logistic regression models: estimate each child's probability of being assigned to each type
- Reference category of dependent variable: “not deprived”
- Independent variables:
 - Multi level concept
(child < household < region)
 - Centering of lower-level variables to determine effects “within” and “between” levels independently

Results – Step 2

Table 2a: Multinomial Logistic Regression Analysis on Ward Cluster Solution – Resources

Ref.: not deprived		No vacation		Used clothes & no vacation		Restricted nutrition & activities		Leisure restrictions & no vacation	
		Beta	SEp	Beta	SEp	Beta	SEp	Beta	SEp
Level 3 (region)	Household income (log10) average	-3.738	5.365	0.360	10.792	1.771	7.457	-1.933	13.094
Level 2 (household)	Household income (log10) centered	-1.661	0.379 ***	-1.185	0.590 *	-1.236	0.489 *	-1.465	0.582 *
	Household earned income (log10) total	0.090	0.120	-0.041	0.222	0.271	0.274	-0.490	0.172 **
	Occupational prestige (ISEI08) highest	-0.019	0.006 **	-0.034	0.011 **	-0.011	0.007	0.001	0.013
	Employment intensity share (%) of 80h	0.005	0.005	-0.034	0.007 ***	0.001	0.008	-0.007	0.015
	Education level (CASMIN) highest (Ref.: basic vocational qualif.)								
	Intermediate vocational qualification	0.180	0.297	0.407	0.539	-0.359	0.416	0.367	0.567
	Tertiary education	-0.614	0.392	0.412	0.822	-0.756	0.543	-0.671	0.887
	Factor social support	-0.200	0.147	-0.270	0.298	-0.155	0.223	-0.256	0.320
	Hours per week for child caring (log10) total	0.278	0.309	1.844	0.835 *	-0.111	0.639	1.383	0.764
...
N (children)		3,690							
N (households)		2,215							
N (regions)		180							
Pseudo R ²		0.277							

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, weighted

Results – Step 2

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Results – Step 2

Table 2b: Multinomial Logistic Regression Analysis on Ward Cluster Solution – Regional Characteristics

Ref.: not deprived		No vacation		Used clothes & no vacation		Restricted nutrition & activities		Leisure restrictions & no vacation	
		Beta	SEp	Beta	SEp	Beta	SEp	Beta	SEp
Level 3 (region)	Factor urbanized	-0.013	0.566	0.301	1.014	-0.246	0.835	1.291	0.987
	Factor strength labor market	0.245	0.285	-1.289	0.493 **	0.688	0.473	-0.529	0.690
	Factor qualification	-0.347	0.281	-0.208	0.630	-0.759	0.538	0.265	0.662
	Factor investments	0.507	0.343	0.162	0.603	0.033	0.466	-0.468	0.602
	Factor government infrastructure	-0.010	0.127	0.326	0.292	-0.001	0.238	0.060	0.292
	Factor impoverishment last 5 years	0.414	0.301	-0.042	0.419	-0.103	0.463	0.532	0.689
	Factor urbanization last 5 years	0.027	0.310	0.592	0.570	-0.211	0.551	-0.537	0.682
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	N (children)	3,690							
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Results – Step 2

Table 2c: Multinomial Logistic Regression Analysis on Ward Cluster Solution – Health, Unemployment, Residency

Ref.: not deprived		No vacation		Used clothes & no vacation		Restricted nutrition & activities		Leisure restrictions & no vacation	
		Beta	SEp	Beta	SEp	Beta	SEp	Beta	SEp
Level 2 (household)	Subjective health average	-0.432	0.176 *	-0.582	0.409	-0.537	0.284	-1.062	0.406 **
Level 1 (child)	Subjective health centered	0.237	0.137	0.072	0.219	0.135	0.203	-0.198	0.251
Level 3 (region)	Social security benefit share (%)	0.971	0.290 **	1.100	0.568	0.808	0.424	1.825	0.694 **
Level 2 (household)	Social security benefit centered	0.868	0.287 **	1.399	0.510 **	0.810	0.428	1.793	0.598 **
Level 3 (region)	One-/two-family house share (%)	0.031	0.022	0.026	0.046	-0.024	0.039	0.060	0.050
Level 2 (household)	One-/two-family house centered	-0.008	0.002 ***	-0.001	0.004	0.002	0.003	0.000	0.005
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Results – Step 2

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Discussion

- Household characteristics most important
 - Centering around labor market position and related resources (income, health and wealth)
 - Limited importance of regional and individual characteristics
 - Education, social support, public infrastructure, demographic characteristics not relevant
- Better prediction of material deprivation per sé; bad distinction of different types of deprivation
 - Result of individual preferences?
 - Social milieus with collective preferences?

Limitations

- Cross-sectional dataset → no conclusion regarding causes of deprivation, but corresponding living conditions
- Indicators driven by parents' assessment
 - Children's perspective?
 - Rationalization of deprivation as financially caused?

References

- Atkinson, A. B. (2003). Multidimensional Deprivation: Contrasting Social Welfare and Counting Approaches. *The Journal of Economic Inequality*, 1(1), 51–65. <https://doi.org/10.1023/A:1023903525276>
- Blatná, D. (2017). *Analysis of EU Countries' Material Deprivation Rate*. Prague. 11th International Days of Statistics and Economics. https://msed.vse.cz/msed_2017/article/272-Blatna-Dagmar-paper.pdf
- Chzhen, Y., Neubourg, C. de, Plavgo, I., & Miliano, M. de. (2014). *Understanding Child Deprivation in the European Union: The Multiple Overlapping Deprivation Analysis (EU-MODA) Approach* (Innocent Working Paper 2014-18). Florence. UNICEF Office of Research.
- Council of the European Communities (1985). Council Decision on specific Community action to combat poverty. *Official Journal of the European*, 28(L 2), 24–25. <https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=OJ:L:1985:002:TOC>
- Dotto, F., Farcomeni, A., Pittau, M. G., & Zelli, R. (2019). A Dynamic Inhomogeneous Latent State Model for Measuring Material Deprivation. *Journal of the Royal Statistical Society Series a: Statistics in Society*, 182(2), 495–516. <https://doi.org/10.1111/rssa.12408>
- Dudek, H. (2019). Country-level Drivers of Severe Material Deprivation. *Ekonomický Časopis*, 67(1), 33–51. <http://hdl.handle.net/11159/3966>
- Dudek, H., & Szczesny, W. (2021). Multidimensional material deprivation in Poland: a focus on changes in 2015–2017. *Quality & Quantity*, 55(2), 741–763. <https://doi.org/10.1007/s11135-020-01024-3>
- Erikson, R. (1974). Welfare as a Planning Goal. *Acta Sociologica*, 17(3), 273–288. <https://doi.org/10.1177/000169937401700305>
- Israel, S., & Spannagel, D. (2019). Material deprivation in the EU: A multi-level analysis on the influence of decommmodification and defamilisation policies. *Acta Sociologica*, 62(2), 152–173. <https://doi.org/10.1177/0001699318778735>
- Kis, A. B., & Gábos, A. (2016). Consistent Poverty across the EU. *Corvinus Journal of Sociology and Social Policy*, 7(2), 3–27. <https://doi.org/10.14267/CJSSP.2016.02.01>
- Kuger, S., Prein, G., Linberg, A., Hoffmann-Recksiedler, C., Herz, A., Gille, M., Berngruber, A., Bernhardt, J., Pötter, U., Zerle-Elsässer, C., Steiner, C., Zimmermann, J., Quellenberg, H., Walper, S., Rauschenbach, T., Maly-Motta, H., Schickle, V., Naab, T., Guglhör-Rudan, A., . . . Deutsches Jugendinstitut. (2020). *Aufwachsen in Deutschland: Alltagswelten 2019 (AID:A 2019)*. <https://doi.org/10.17621/aida2019>
- Lane, R. E. (1994). Quality of Life and Quality of Persons. *Political Theory*, 22(2), 219–252. <https://doi.org/10.1177/0090591794022002002>
- Łuczak, A., & Kalinowski, S. (2020). Assessing the level of the material deprivation of European Union countries. *PLoS One*, 15(9), e0238376. <https://doi.org/10.1371/journal.pone.0238376>
- Najera Catalan, H. E. (2017). Multiple Deprivation, Severity and Latent Sub-Groups: Advantages of Factor Mixture Modelling for Analysing Material Deprivation. *Social Indicators Research*, 131(2), 681–700. <https://doi.org/10.1007/s11205-016-1272-y>
- Šoltés, E., & Ulman, P. (2015). Material Deprivation in Poland and Slovakia – a Comparative Analysis. *Zeszyty Naukowe Uniwersytetu Ekonomicznego W Krakowie*(11(947)), 19–36. <https://doi.org/10.15678/ZNUEK.2015.0947.1102>
- Townsend, P. (1979). *Poverty in the United Kingdom: A survey of household resources and standards of living*. Univ. of Calif. Press.
- Whelan, C. T., & Maître, B. (2012). *Understanding Material Deprivation in Europe: A Multilevel Analysis* (GINI Discussion Paper No. 37). Amsterdam. AIAS. https://gini-research.org/wp-content/uploads/2021/03/DP_37_Understanding-Material-Deprivation-in-Europe.-A-Multilevel-Analysis.pdf