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Samples, Weights and Nonresponse

NEPS Starting Cohort 2 — Kindergarten From Kindergarten to Elementary School

Wave 9



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Samples, Weights, and Nonresponse: the Kindergarten Cohort of the National Educational Panel Study (Wave 9)

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1 Prequel

The National Educational Panel Study (NEPS) surveys a cohort sample of Kindergarten children and Grade 1 students (Starting Cohort 2, SC2) and follows them over their transition to elementary school and beyond. The data are released via corresponding Scientific Use Files (SUF). The current SUF version is available under DOI:10.5157/NEPS:SC2:9.0.0.¹

This paper supplements the previous reports for weighting by Würbach (2018a, 2018b, 2019), Würbach, Steinhauer, and Zinn (2017) as well as the more detailed NEPS Working Paper by Steinhauer, Zinn, Gaasch, and Goßmann (2016) and the Technical Report by Steinhauer and Zinn (2016), which give information on the applied indirect sampling procedure, the derivation of design weights, their successive adjustments, and the derivation of panel weights for previous waves.

In 2013, the cohort of Kindergarten children transitioned to elementary school. Children who transitioned to previously sampled schools were followed up within their institutional context together with their classmates who augment the cohort sample. Besides that, there are previously sampled schools no children transitioned to. Students within these schools also augment the cohort sample. Children who transitioned to other schools were tracked individually. By design, these children did not take part in the tests until Wave 6. Then, in Wave 6 (Grade 4), the entire sample was surveyed and tested again. As of Wave 7, surveying and testing was no longer done in the institutional context but in the individual retracking field for all targets.

Due to its composition the panel cohort of SC2 can be categorized into three groups:

- Group 1 The group of students tested in Grade 1 in elementary schools, who were not tested in Kindergarten institutions in Wave 1 and Wave 2. These (target) persons form the augmentation sample of Wave 3.
- Group 2 The group of Kindergarten children who were tested only in Kindergartens in Wave 1 and Wave 2. In Wave 3, they are assigned to the individual retracking field and are temporary dropouts by design until Wave 6.
- Group 3 The group of Kindergarten children, who were tested in Kindergartens in Wave 1 and Wave 2 and transition to elementary schools surveyed by NEPS in Wave 3. These (target) persons belong to the longitudinal sample of Waves 1, 2, and 3.

Table 1 documents the accordant study numbers and survey year available in the current SUF.

¹For general information on the NEPS, see Blossfeld, Roßbach, and von Maurice (2011). More detailed information is available in the documentation section on the homepage.

Wave	Year	Time	Study number
Kinde	rgarten	children	
1	2011	4-5 years	A12
2	2012	5-6 years	A13
Eleme	entary s	chool stude	nts
3	2013	Grade 1	A14, A14A
4	2013	Grade 2	A15, A15-L1
5	2014	Grade 3	A89
6	2015	Grade 4	A97, B103
7	2016	Grade 5	B104
8	2017	Grade 6	B105
9	2018	Grade 7	B129

Table 1: Survey overview for Starting Cohort 2.

For all participating children cross-sectional and, where appropriate, longitudinal weights are provided. Cross-sectional weights are assigned to children relying on their participation in the different panel waves. Furthermore, weights are given for subgroups of the panel cohorts that are of special interest in our analysis. This concerns particularly the group of children continually taking part in the successive waves of the survey and the group of children and parents participating jointly. Longitudinal weights are provided for those children who have continually participated. Additionally, longitudinal weights are provided for joint participation of children and parents. Please note that in Wave 8 no parent interviews were administered.

The remainder of this supplement is structured as follows: Section 2 details the panel progress as well as the new features of the corresponding weighting data sets. The weighting adjustments are described in Section 3. This section contains the analyses of nonresponse in Wave 9. All nonresponse models are estimated using (multilevel) probit models.

Finally, Section 4 concludes with a summary of the provided sampling weights and design information given in the corresponding weighting data sets.

2 Panel progress

The following Table 2 details the panel progress of Starting Cohort 2 by differentiating participants, temporary dropouts, and final dropouts for each group separately and in total. Final dropouts are separated into final dropouts due to refusal during the survey period and final dropouts between two consecutive waves.

			anel Col	nort	Status	at the end of	the wave	
Wave	Group	Total size	Not used	Used sample	Participants	Temporary dropout	Final dropout (in wave)	Final dropout (after wave)
1	All	^a 3007	0	3007	2949	47	11	0
2	All	2996	^b 215	2781	2727	54	0	1
3	All	9336	2419	6917	6733	184	0	5
	1	6341	0	6341	6176	165	0	2
	2	2419	2419	-	-	-	-	^c 3
	3	576	0	576	557	19	0	0
4	All	9331	2733	6598	6340	232	26	23
	1	6339	296	6043	5801	217	25	15
	2	2416	2416	-	-	-	-	2
	3	576	21	555	539	15	1	6
5	All	9282	3118	6164	5799	204	161	77
	1	6299	669	5630	5296	185	149	41
	2	2414	2414	-	-	-	-	31
	3	569	35	534	503	19	12	5
6	ALL	9044	555	8489	6942	1180	367	^{<i>d</i>,<i>e</i>} 693
	1	6109	62	6047	5461	425	161	^d 185
	2	2383	458	1925	998	735	192	^d 497
	3	552	35	517	483	20	14	^d 11
7	ALL	7984	^{<i>f,g</i>} 50	7934	4220	3671	43	43
	1	5763	12	5751	3246	2472	33	31
	2	1694	4	1690	648	1032	10	9
	3	527	34	493	326	167	0	3
8	ALL	7898	^g 18	7880	4164	3691	25	^e 2186
	1	5699	13	5686	3147	2522	17	1357
	2	1675	4	1671	682	982	7	730
	3	524	1	523	335	187	1	99
9	ALL	5687	^g 25	5662	4088	1088	486	^e 133
	1	4325	20	4305	3096	824	385	108
	2	938	4	934	668	193	73	15
	3	424	1	423	324	71	28	10

Table 2: Panel progress of Starting Cohort 2 by wave.

Notes: "-" does not apply; Group 1 – The group of students tested in Grade 1 in elementary schools, who were not tested in Kindergarten institutions in Wave 1 and Wave 2. These (target) persons form the augmentation sample of Wave 3; Group 2 – The group of Kindergarten children who were tested only in Kindergartens in Wave 1 and Wave 2. In Wave 3, they are assigned to the individual retracking field and are temporary dropouts by design until Wave 6, Group 3 – The group of Kindergarten children, who were tested in Kindergartens in Wave 1 and Wave 2 and transition to elementary schools surveyed by NEPS in Wave 3. These (target) persons belong to the longitudinal sample of Waves 1, 2, and 3.; ^a Panel size in Wave 1 is larger than the number of cases in the SUF, because of 11 final dropouts after Wave 1 and before publication of the SUF. Thus these cases are not included.; ^b Cases not used left the institution they were surveyed in. These cases are tracked individually and surveyed again in Wave 6, when they are supposed to be in Grade 4. In the SUF their status is temporary dropout.; ^c Final dropouts after Wave 6, 2173 after Wave 8, 102 after Wave 9,; ^f 33 target students could not have been surveyed and tested for technical reasons.; ^a Target students abroad remain in the panel sample, while not being contacted: 16 in Wave 7, 18 in Wave 8, and 25 in Wave 9.

Compared to the previous release of the SC2 SUF (version 8.0.1), the current weighting data set again includes weights for joint participation of targets and parents.

3 Weighting Adjustments for Wave Participation

Systematic refusals may arise and for this, the (non)response and attrition processes of the sampled individuals, has to be accounted for. Thus, for reasons of usability, commonly design weights are adjusted to account for nonresponse in the survey. For this purpose, the units' probabilities to participate in each survey wave as well as in consecutive waves are employed. The processing in the nonresponse analysis is detailed in Chapter 3 in Steinhauer et al. (2016) as well as in Steinhauer and Zinn (2016). The following estimated (non)response models are used as basis for calculation of participation probabilities and hence serve as adjustment factors to derive cross-sectional and longitudinal survey weights.

3.1 Modeling Participation in Wave 9

To estimate the individual participation propensities for students in Grade 7 (participants in Wave 9) a (multilevel) probit model is used.² The individual participation propensities were used to derive adjustment factors for adjusted wave-specific cross-sectional and longitudinal weights. The results are given in Table 3. As can be seen, participation in previous waves highly influences the participation probability in the current wave in all three groups. In Group 3 the individual probability of attendance is also significantly influenced by the age. The younger half of students is less likely to participate than the older half of students. In Group 2 the place of residence significantly influences participate than students living with a single parent. In Group 1 the age effect is reverse with younger students being more willing to participate than the older ones. Finally, male students have a higher likelihood to participate than female students.

Joint participation propensities for targets and one parent are given in Table 4. In all three groups previous wave participation is highly significant for joint participation. In Group 2 also the information living together with both parents and whether German is spoken at home is highly significant with respect to joint participation propensity, although being less significant.

Please refer to Steinhauer et al. (2016) and Steinhauer and Zinn (2016) regarding the interpretation of the participation propensity in previous waves.

²To model individual participation in the school context, the glmer function with a probit link provided by lme4 package (Bates, Mächler, Bolker, & Walker, 2015) in R (R Core Team, 2020) was used.

		Wave 9	
	Group 3	Group 2	Group 1
Constant	-0.024	-1.337***	-0.581***
	(0.164)	(0.207)	(0.119)
Gender: male (ref. = "female")			0.092**
			(0.043)
Target age group: younger half (ref. = "older half")	-0.293**		0.095**
	(0.141)		(0.044)
Place of residence: both parents (ref. = "single parent")		0.284**	
		(0.131)	
Participation in Wave 2: yes (ref. = "no")		0.319**	
		(0.157)	
Participation in Wave 6: yes (ref. = "no")		1.140***	0.391***
		(0.108)	(0.112)
Participation in Wave 7: yes (ref. = "no")	0.461***	0.432***	0.350***
	(0.166)	(0.106)	(0.052)
Participation in Wave 8: yes (ref. = "no")	0.751***	0.378***	0.678***
	(0.170)	(0.109)	(0.051)
Random intercept (SD) at the school level	. ,	· ·	0.241
Observations	423	934	4,305

Table 3: Models estimating the individual participation propensities for students in Grade 7.

Note: p < 0.1; p < 0.05; p < 0.05; p < 0.01; standard errors are given in parentheses. Group 1 – The group of students tested in Grade 1 in elementary schools but not being tested in Kindergarten institutions in Wave 1 and 2 (forming the augmentation sample of Wave 3); Group 2 – The group of Kindergarten children individually tested in Wave 6; Group 3 – The group of Kindergarten children being tested in Kindergartens in Wave 1 and Wave 2 and transition to elementary schools surveyed by NEPS in Wave 3.

Table 4: Models estima	iting the joint _i	participation p	ropensities for	students and p	oarents in Grac	Je 7.
	Gro	oup 3	Gro	up 2	Gro	up 1
	Student	Parent	Student	Parent	Student	Parent
Constant	-0.381^{*}	-2.618^{***}	-1.202***	-2.979***	-0.625***	-1.998^{***}
	(0.155)	(0.183)	(0.177)	(0.274)	(0.107)	(0.082)
Place of residence: both parents				0.341^{*}		
(ref. = "single parent")				(0.146)		
German spoken at home: yes				0.543^{**}		
(ref. = "no")				(0.170)		
Target part. in Wave 2: yes			0.314^{*}			
(ref. = "no")			(0.152)			
Target part. in Wave 6: yes			0.996***	0.564***	0.181	
(ref. = "no")			(0.112)	(0.130)	(0.101)	
Target part. in Wave 7: yes	0.513^{***}		0.564***	0.345**	0.636***	0.548***
(ref. = "no")	(0.142)		(0.100)	(0.105)	(0.046)	(0.048)
Target part. in Wave 9: yes		2.794***				
(ref. = "no")		(0.142)				
Parent part. in Wave 2: yes				0.371^{*}		
(ref. = "no")				(0.165)		
Parent part. in Wave 4: yes						0.274***
(ref. = "no")						(0.072)
Parent part. in Wave 5: yes				0.396^{**}		0.337***
(ref. = "no")				(0.132)		(0.064)
Parent part. in Wave 6: yes	0.964***		0.643***	0.606***	0.249***	0.603***
(ref. = "no")	(0.147)		(0.100)	(0.135)	(0.064)	(0.072)
Parent part. in Wave 7: yes		1.032^{***}		0.826***	0.513***	1.010^{***}
(ref. = "no")		(0.159)		(0.137)	(0.062)	(0.067)
Correlation	0-	.791	0	369	0.	482
Observations	Δ	123	6	34	4,	305
Notes: *p<0.1; **p<0.01; ***p<0.05; standard er age (Marra & Radice, 2013; Radice, Marra, & Wojt	rors are given in pare :vs, 2016) in R was use	ntheses. For modeling d (R Core Team, 2020).	joint participation dec	isions, the SemiParBI	VProbit function in tl	he same named pack-

4 Summary of Weights

The NEPS provides various kinds of weights for Kindergarten children and elementary school students together with design information. Table 5 lists the design information and the different weights provided by SUF release version DOI:10.5157/NEPS:SC2:9.0.0. In SC2, weights are provided in three distinct weighting files: one for Kindergarten children (Groups 2 and 3), which is frozen in Wave 6 and will not be continued, one for elementary school students (Groups 1 and 3), and one for Grade 4 students transferring to lower secondary education (Sec I). The weighting data sets provide all cross-sectional and longitudinal weights in a trimmed and standardized form. Weights are standardized with mean 1 to ease statistical weighted analysis, cp. Chapter 4 in Steinhauer and Zinn (2016).

Summary statistics for all kind of weights provided are given in Table 6.

Please refer to Chapter 6 in Steinhauer and Zinn (2016) for advices regarding the usage of weights.

Variable	Applies to	Content
Identifier		
ID_t	all targets	Identifier for target person
ID_i	all targets	Identifier for the school the target person was initially sampled in
Design informatio	n	
tstud_st	all targets	Study number the target person was first surveyed in (A12, A14, A14A)
group	all targets	Grouping variable for children in Kindergarten and school context
stratum_imp2_R	schools	Implicit sampling stratum (Federal State the school is located in according to sampling frame)
stratum_imp3_R	schools	Implicit sampling stratum (regional classification according to sampling frame)
stratum_imp4_R	schools	Implicit sampling stratum (funding according to sampling frame)
tx80112_R	schools	Total amount of students in Grade 2 (from Official Statistics)
Weights referring	to Kindergar	ten children (Groups 2 and 3)
w_i	2996	Nonresponse adjusted design weight for Kindergarten, with i = 1,, 268
w_t	2996	Calibrated nonresponse adjusted design weight for target (Kindergarten child)
w_t1	2949	Cross-sectional weight for targets participating in Wave 1
w_tp1	2309	Cross-sectional weight for targets jointly participating with one parent in Wave 1
w_t2	2727	Cross-sectional weight for targets participating in Wave 2
w_tp2	1965	Cross-sectional weight for targets jointly participating with one parent in Wave 2
w_t12	2685	Longitudinal weight for targets participating in Wave 1 and 2
w_tp12	1804	Longitudinal weight for targets jointly participating with one parent in Wave 1 and 2
w_t123	539	Longitudinal weight for targets participating in Wave 1, 2, and 3
w_tp123	388	Longitudinal weight for targets jointly participating with one parent in Wave 1, 2, and 3
w_t1234	504	Longitudinal weight for targets participating in Wave 1 up to Wave 4
w_tp1234	335	Longitudinal weight for targets jointly participating with one parent in Wave 1 up to Wave 4
w_t12345	460	Longitudinal weight for targets participating in Wave 1 up to Wave 5
w_tp12345	276	Longitudinal weight for targets jointly participating with one parent in Wave 1 up to Wave 5
w_t123456	433	Longitudinal weight for targets participating in Wave 1 up to Wave 6
w_tp123456	238	Longitudinal weight for targets jointly participating with one parent in Wave 1 up to Wave 6

Table 5: Variables	included in the	weighting data sets	for SC2 SUF version	1 9.0.0.

Variable	Applies to	Content
Weights referring	to elementar	y schools students (Groups 1 and 3)
w_i	6917	Nonresponse adjusted design weight for elementary school, i = 1,, 279
w_t	6917	Calibrated nonresponse adjusted design weight for target (Grade 1 student)
w_t3	6733	Cross-sectional weight for targets participating in Wave 3
w_tp3	5636	Cross-sectional weight for targets jointly participating with one parent in Wave 3
w_t4	6340	Cross-sectional weight for targets participating in Wave 4
w_tp4	4866	Cross-sectional weight for targets jointly participating with one parent in Wave 4
w_t34	6189	Longitudinal weight for targets participating in Wave 3 and 4
w_tp34	4488	Longitudinal weight for targets jointly participating with one parent in Wave 3 and 4
w_t5	5799	Cross-sectional weight for targets participating in Wave 5
w_tp5	4026	Cross-sectional weight for targets jointly participating with one parent in Wave 5
w_t345	5567	Longitudinal weight for targets participating in Wave 3, 4 and 5
w_tp345	3501	Longitudinal weight for targets jointly participating with one parent in Wave 3, 4 and 5
w_t6	6942	Cross-sectional weight for targets participating in Wave 6
w_tp6	4641	Cross-sectional weight for targets jointly participating with one parent in Wave 6
w_t3456	5256	Longitudinal weight for targets participating in Wave 3 up to Wave 6
w_tp3456	3047	Longitudinal weight for targets jointly participating with one parent in Wave 3 up to Wave 6
w_t7	4220	Cross-sectional weight for targets participating in Wave 7
w_tp7	3247	Cross-sectional weight for targets jointly participating with one parent in Wave 7
w_t34567	3093	Longitudinal weight for targets participating in Wave 3 up to Wave 7
w_tp34567	2099	Longitudinal weight for targets jointly participating with one parent in Wave 3 up to Wave 7
w_t8	4164	Cross-sectional weight for targets participating in Wave 8
w_t345678	2607	Longitudinal weight for targets participating in Wave 3 up to Wave 8
w_t9	4088	Cross-sectional weight for targets participating in Wave 9
w_tp9	2971	Cross-sectional weight for targets jointly participating with one parent in Wave 9
w_t3456789	2135	Longitudinal weight for targets participating in Wave 3 up to Wave 9
w_tp345679	1539	Longitudinal weight for targets jointly participating with one parent in Wave 3 up to 7, and 9

Table 5: Variables included in the weighting data sets for SC2 SUF version 9.0.0. (continued)

Variable	Applies to	Content					
Joint weights refe	Joint weights referring to Grade 4 students (Groups 1, 2 and 3)						
w_p6	9044	Calibrated panel entry weight for target (Grade 4 student)					
w_p6_joint	9044	Calibrated joint panel entry weight for target (Grade 4 student)					
w_t6	6942	Cross-sectional weight for targets participating in Wave 6					
w_tp6	4641	Cross-sectional weight for targets jointly participating with one parent in Wave 6					
w_t7	4220	Cross-sectional weight for targets participating in Wave 7					
w_tp7	3247	Cross-sectional weight for targets jointly participating with one parent in Wave 7					
w_t67	4015	Longitudinal weight for targets participating in Wave 6 and 7					
w_tp67	2988	Longitudinal weight for targets jointly participating with one parent in Wave 6 and 7					
w_t8	4164	Cross-sectional weight for targets participating in Wave 8					
w_t678	3385	Longitudinal weight for targets participating in Wave 6 up to Wave 8					
w_t9	4088	Cross-sectional weight for targets participating in Wave 9					
w_tp9	2971	Cross-sectional weight for targets jointly participating with one parent in Wave 9					
w_t6789	2806	Longitudinal weight for targets participating in Wave 6 up to Wave 9					
w_tp679	2178	Longitudinal weight for targets jointly participating with one parent in Wave 6, 7, and 9					

Table 5: Variables included in the weighting data sets for SC2 SUF version 9.0.0. (continued)

Label of weight	Min.	Lower Quart.	Median	Mean	Upper Quart.	Max.		
Weights referring	to Kinde	rgarten children	(Groups 2	and 3)				
w_i	14.572	76.065	106.448	138.220	157.145	1564.080		
w_t	9.120	94.544	143.477	216.117	248.543	3269.703		
w_t1	0.044	0.456	0.693	1.000	1.210	4.267		
w_tp1	0.046	0.462	0.703	1.000	1.218	4.252		
w_t2	0.041	0.431	0.677	1.000	1.187	4.454		
w_tp2	0.030	0.326	0.516	1.000	0.951	5.199		
w_t12	0.044	0.455	0.706	1.000	1.213	4.255		
w_tp12	0.044	0.474	0.699	1.000	1.182	4.222		
w_t123	0.112	0.466	0.736	1.000	1.224	4.110		
w_tp123	0.102	0.470	0.734	1.000	1.209	4.056		
w_t1234	0.111	0.462	0.726	1.000	1.236	4.174		
w_tp1234	0.098	0.455	0.726	1.000	1.245	4.183		
w_t12345	0.110	0.458	0.727	1.000	1.225	4.151		
w_tp12345	0.098	0.454	0.735	1.000	1.247	4.127		
w_t123456	0.112	0.466	0.735	1.000	1.235	4.093		
w_tp123456	0.099	0.460	0.722	1.000	1.260	4.120		
Weights referring to elementary schools students (Groups 1 and 3)								
w_i	9.452	23.505	30.904	39.315	43.397	332.640		
w_t	16.668	48.043	73.305	97.546	115.784	3869.294		
w_t3	0.174	0.507	0.778	1.000	1.235	3.749		
w_tp3	0.159	0.491	0.753	1.000	1.226	3.931		
w_t4	0.159	0.477	0.731	1.000	1.181	4.089		
w_tp4	0.100	0.330	0.510	1.000	0.930	5.297		
w_t34	0.174	0.513	0.783	1.000	1.233	3.700		
w_tp34	0.166	0.515	0.765	1.000	1.231	3.720		
w_t5	0.147	0.454	0.700	1.000	1.160	4.362		
w_tp5	0.056	0.195	0.315	1.000	0.641	5.726		
w_t345	0.171	0.513	0.782	1.000	1.228	3.675		
w_tp345	0.160	0.497	0.762	1.000	1.234	3.792		
w_t6	0.093	0.328	0.534	1.000	1.032	5.076		
w_tp6	0.022	0.118	0.204	1.000	0.575	5.806		
w_t3456	0.169	0.512	0.784	1.000	1.235	3.688		
w_tp3456	0.159	0.502	0.756	1.000	1.225	3.786		
w_t7	0.067	0.255	0.441	1.000	0.921	5.403		
w_tp7	0.021	0.081	0.148	1.000	0.498	5.868		
w_t34567	0.152	0.498	0.778	1.000	1.263	3.701		
w_tp34567	0.161	0.501	0.749	1.000	1.247	3.806		
w_t8	0.040	0.168	0.329	1.000	0.914	5.572		
w_t345678	0.151	0.491	0.769	1.000	1.258	3.769		
w_t9	0.034	0.152	0.334	1.000	1.008	5.528		
w_tp9	0.011	0.047	0.107	1.000	0.705	5.864		
w_t3456789	0.157	0.484	0.767	1.000	1.249	3.824		
w_tp345679	0.162	0.496	0.747	1.000	1.238	3.826		

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Label of weight	Min.	Lower Quart.	Median	Mean	Upper Quart.	Max.
Joint weights refe	erring to (Grade 4 students	(Groups 1	, 2 and 3)		
w_p6	11.852	58.169	95.355	155.992	173.955	4501.028
w_p6_joint	3.123	37.049	56.559	77.996	92.182	2832.785
w_t6	0.068	0.476	0.744	1.000	1.230	3.995
w_tp6	0.047	0.423	0.660	1.000	1.174	4.467
w_t7	0.092	0.395	0.654	1.000	1.118	4.622
w_tp7	0.049	0.277	0.447	1.000	0.872	5.400
w_t67	0.109	0.457	0.730	1.000	1.214	4.041
w_tp67	0.080	0.427	0.664	1.000	1.184	4.410
w_t8	0.066	0.262	0.466	1.000	1.036	5.243
w_t678	0.128	0.452	0.723	1.000	1.201	4.121
w_t9	0.047	0.216	0.414	1.000	1.107	5.300
w_tp9	0.021	0.139	0.262	1.000	0.765	5.701
w_t6789	0.121	0.445	0.720	1.000	1.197	4.161
w_tp679	0.075	0.439	0.679	1.000	1.183	4.416

Table 6: Summary statistics for all weights provided. (continued)

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