LATENT PATTERNS OF TRANSITION TO ADULTHOOD IN MOLDOVA GENDER-TO-GENDER, GENERATION-TO-GENERATION

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Abstract. *The Transition to Adulthood (TA) patterns are sometimes classified into two broad categories: modern and traditional (Billari & Liefbroer, 2010). This classification is usually confirmed by the research of trends of the age of transition events: the first childbirth, the first marriage, the first employment, etc. In this paper, I try to do such classification for the Moldovan 1941 – 1985 birth cohorts. I apply the Latent Profile Analysis to the Gender and Generation Survey of 2020 to cluster by the means and variance of the events and their covariances. To account for the powerful crisis that happened in 1990, I use two cohort subsamples; to account for the differences between gender's transition to adulthood, I also divide between men and women. I find three profiles for three subsamples and four profiles for the 1941 – 1956 male cohort. In every subsample, there is a group with a clearly traditional timing of events. The "more modern" patterns of transition to adulthood are more difficult to classify.*
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Introduction. In this paper, I consider the *Transition to Adulthood (*TA) patterns in Moldova. While there are multiple ways to classify TA patterns, I primarily build upon the distinctions highlighted by Billari and Liefbroer (2010), who used the timing of events. They came up with a dichotomy of traditional and modern patterns of TA, with the former being short and early and the latter being long and delayed.

To find if the patterns of TA in Moldova follow this dichotomy, I implemented the Latent Profile Analysis on the Gender and Generation Survey (GGS). The Latent Profile Analysis is not the usual way to classify TA. However, it allows accounting for covariance between the events. GGS has data on four events: first partnership, first marriage, first childbirth, and the achievement of the latest level of education. Three of them were used, with the exception of the first partnership. I divided the sample into four subsamples and completed the LPA for each of them separately. As a result, for three subsamples, the models with three profiles were chosen, and for

one subsample, the model with four profiles was chosen. Most of the profiles had a corresponding profile in a subsample for the same gender and different birth cohort.

Literature review. Transition to adulthood is a complicated process, when one acquires multiple new roles, achieves new forms of capital, and suffers from serious mental and psychological changes. It is also the first period for individuals to make life-shaping decisions, from career path and education length to childbearing. The mainstream approach to TA considers the outcome as an interaction between an individual and their environment (Dennison, 2016). The environment and decisions of a single individual are unpredictable, and their own representation of TA may be unique. However, overall, patterns can be spotted, and then one can find trends in these patterns. Some of these can be attributed to the structural environmental changes (e.g., raising costs of having children Werding, 2014), while other relate to the changes in the individuals' values (Sobotka, 2008).

There are different ways to classify TA patterns. For example, in the only previous study on the Moldovan TA patterns, Crismaru (2024) classified the TA patterns based on the individuals' socio-economic security and their employment. She specifically used those aged 15-35, which corresponds to 1985-2005 birth cohorts. In this paper, I consider the individuals' ages when completing milestones and the variances of the ages. This setup corresponds to the spirit of Billari & Liefbroer (2010) who detected the trend in TA from the one they called *traditional* to the one they called *modern*. Defined against each other, traditional TA is "early, contracted, and simple" (p. 60), while modern TA is "late, protracted, and complex" (p. 60). They detected that, cohort-to-cohort, the age of the milestone completion increased, overall, in four European regions. It it should be noted this did not hold for every country, sometimes the changes rolled back, and Eastern Europe had the smallest increase of the four European regions.

Later studies on the age of the milestone provided varying pictures for different countries. In their study on twenty European countries, Lesnard et al. (2016) show a flourishing picture. Among the 'eastern' and 'southern' societies, two types of TA are widespread: *early birds* and *family* types. The early bird type consists of those who have their transition fast, early, and in a standard order. For the *family* types, the chief transition is from their parenting family to the procreation one. Sometimes, individuals form families without leaving their parenting families. I would note that these profiles were present in almost every nation, although in differing proportions.

To sum up, when analyzing Moldova, I expect no less than two TA patterns (traditional and modern). As the more lengthy TA pattern, the span of the modern TA must be longer than the one of the traditional one. As the more chaotic TA pattern, the variance of the timing of the event should be higher. Mitrofanova (2019) notes that (in Russia) modern TA events follow a sequence with the demographic events happening after the economic ones.

There are two major objections and issues with these poles. First, Billari & Liefbroer (2010) define TA patterns relatively. The modern TA is a *more* random, *more* delayed, and *more* prolonged version of traditional pattern. Hypothetically, it means that the modern TA of past generations can overlap with the traditional TA of

the contemporary generations. This is especially true if one does not take gender into account (i.e., some contemporary modern female transitions may overlap with traditional male transitions of the past). I try avoiding it by treating generations and genders separately from each other; the divide is discussed more closely in the Methods section.

Second, I also expect the set of patterns to not be limited to two, because of the generations that had their TA during the 1990s crisis (political instability coupled with war and protracted recession). For quite some time, their lives did not have prospects of improvement, and their decisions must have shifted accordingly. In other words, while the structure changed significantly, the individual choices must have changed as well. Many delayed their demographic transition, including those who, in different times, would have had a traditional transition to adulthood (Sobotka, 2008). This set of events, their timing, and pattern can be treated as a modern transition to adulthood, but I would argue that they should be separated.

Methods. To check the hypotheses, I apply Latent Profile Analysis (LPA) on the *Gender and Generation 2020 Survey* (GGS) in Moldova, with individuals born between 1941 and 1985. GGS only surveyed those aged 79 or younger, and this determined the upper boundary of age. The lower boundary of age is 35. This is due to the self-censorship of those younger: they simply have not lived through these events yet. The number of individuals confirming this condition is 7507.

I divide the sample into four subsamples: by gender and by birth before and after January 1, 1957. Those born before have not experienced the 1990s economic and political crisis during their TA and thus had a different environment than those born after. For shortness, the 1941 – 1956 cohort will be referred to as "older" and the 1957 – 1985 cohort will be referred to as "younger". This yielded subsamples of 971 (older men), 1933 (younger men), 1810 (older women), and 2793 (younger women).

Four events are available in the GGS: the first partnership (question code lhi04_1 or dem30b), the first marriage (depending on the context, it is either dem_28b or the first one in the lhi_05b group), the first childbirth (the lhi29 group, the condition for childbirth rather than adoption taken from the lhi26 group), the ending of the education (dem_08). I only use three of them, deleting the partnership event. The reason for this is two-fold. First, the data on partnerships is incomplete. Specifically, we do not know if those who lived together before and stopped by the moment of the interview ever lived together. Second, the data on partnership is strongly correlated with the data on marriage. The Pearson's correlation varied from 0.81 (younger women) to 0.92 (older men). This virtually prohibits from using an LPA model that allows for covariance between the events; specifically, the model with 30000 iterations and 3000 steps for each iteration did not converge whereas it is more standard to use models with 7000 iterations and 300 steps (Spurk et al., 2020)[1]. Overall, the lack of partnership, employment, and separation makes the study

[1] 14000 iterations and 600 steps per iteration were used.

a priori incomplete. I believe, however, that one can spot and classify patterns of transition with education, marriage, and childbirth.

It is a more classical approach to use longitudinal versions of Latent Class Analysis (Helske & Helske, 2019). The biggest disadvantage of the Hidden Mixture Markov Chains is the assumption of the independence of events. In many instances, this is not the case. Covariances are also likely to be different for different transition patterns. Latent Profile Analysis Model 6 (Rosenberg & Van Lissa, 2018) allows for that. At the same time, there are two problems arising from the Latent Profile Analysis. First, the number of profiles is likely to be overinflated due to the skewness of the data. LPA assumes that the distribution of variables (inside one profile) is normal (non-skewed), but this is impossible in some cases. Second, it does not allow for missing data, and the data for the three events had to be imputed. The data are unlikely to be missing at random, and it adds to a bias (Heymans & Twisk, 2022).

Main results. In this section, I first discuss the choice of the number of profiles per subsample, then describe the profiles, and then try to make a correspondence between the profiles and the TA profiles described in the literature.

The choice of the number of profiles generally followed the rules presented by Spurk et al. (2020). There were several cut-off points; specifically, the profiles should not have been less than 3% of the sample and the entropy should not have been less than 0.6. After the models that did not pass the criteria were filtered out, the models that were chosen by the information criteria were revised. For every subsample, a model with fewer profiles was chosen. The fit statistics for the profiles can be found in *Table 1*.

The following is an example of a choice when a less parsimonious solution was chosen. When considering the older male cohort, a change in the number of profiles from four to three resulted in no substantial change for two profiles (*Unpredictable* and *Graduation Delayers* in the final version). Two other profiles (*Traditional* and *Intermediary* in the final version) were united into one. Their mean ages of graduation are virtually the same, and the variance of graduation is small (3.1 and 4.3, respectively, which virtually means that everyone in the profiles had secondary education alone). The covariance were also substantially similar with strong covariance between the age of childbirth and marriage and virtually no covariance between demographic events and graduation. At the same time, the differences in the ages of marriage and childbirth are around two years, and the *Intermediary* profile has greater variances of these ages. Overall, the differences in the demographic transitions of the profiles were deemed critical and the profiles are treated as different.

Table 1. **Fit indices of the four subsamples.**
The unacceptable values (vis-à-vis the cut-off points) are marked orange.
The optimal number of profiles (vis-à-vis the information criteria) is marked in bold.
The final number of classes picked is marked in bold (2nd column)

	Classes	AIC	AWE	BIC	Entropy	Minimal Profile Share	Maximal Profile Share
Male old	1	16744	16874	16787	1	100	100
	2	14738	15017	14830	0,83	18,5	81,5
	3	14433	**14859**	14574	0,7	13,5	50,5
	4	14315	14889	14505	0,65	9,4	40,7
	5	14228	14950	**14467**	0,64	6,9	44,5
	6	**14189**	15058	14476	0,65	4,6	42,8
Male adult	1	32500	32643	32550	1	100	100
	2	28793	29098	28899	0,8	24,1	75,9
	3	28289	28755	28450	0,66	17,1	58,4
	4	27952	28579	28169	0,61	12,5	52,7
	5	27782	**28571**	28055	0,62	6,7	51,3
	6	**27677**	28628	**28006**	0,66	3,2	52,9
Female old	1	30565	30707	30615	1	100	100
	2	26884	27187	26989	0,8	24,5	75,5
	3	26311	26774	26470	0,71	18,1	60,6
	4	26042	**26665**	26257	0,66	5,3	54,4
	5	25941	26724	26211	0,66	4,1	51,4
	6	**25860**	26803	26184	0,67	2,5	48,2
Female adult	1	46707	46857	46761	1	100	100
	2	40389	40707	40501	0,82	27,6	72,4
	3	39723	40211	39895	0,72	13,4	64,4
	4	39359	40015	39590	0,66	8,5	42
	5	39129	**39954**	39419	0,67	2,4	39,9
	6	**38999**	39993	**39349**	0,64	2,4	44,6

Source: author's calculations based on GGS

In *Table 2*, one can find the general characteristics of the profiles with the suggested names. The variances of the events' timing that exceed 45 are marked in bold.

Table 2. ***Mean and Variance of Events***

Cohort	Class	Education	Marriage	Childbirth	Size	Name
Male old	1	17.2 (3.1)	22.6 (4.1)	23.6 (4.2)	395 (41%)	Traditional
Male old	2	16.9 (4.3)	24.8 (19.7)	26.5 (17.5)	149 (15%)	Intermediary
Male old	3	24 (38.2)	24.3 (7)	25.3 (7.6)	336 (35%)	Graduation Delayers
Male old	4	26.3 (**103.5**)	28.5 (**76.9**)	29.8 (**51.9**)	91 (9%)	Unpredictable
Male young	1	17.1 (2.3)	23.7 (6.7)	24.6 (6.7)	1128 (58%)	Traditional
Male young	2	22.2 (**50.5**)	25 (12.1)	26.2 (13.4)	474 (25%)	Graduation Delayers
Male young	3	18.4 (15.5)	28.6 (**56.6**)	29.1 (41.2)	331 (17%)	Family Delayers
Female old	1	17.2 (7)	20.4 (3.6)	21.4 (3.8)	1096 (61%)	Traditional
Female old	2	23 (**54.5**)	23.2 (9.9)	24.2 (10.3)	386 (21%)	Graduation Delayers
Female old	3	19.2 (30.7)	25.6 (**48.8**)	26.4 (29.3)	328 (18%)	Family Delayers
Female young	1	17.6 (4.5)	20.3 (4)	21.2 (4.3)	1799 (64%)	Traditional
Female young	2	23.1 (**68.3**)	23 (11.6)	24.3 (13.6)	621 (22%)	Graduation Delayers
Female young	3	18.5 (14)	27 (41.7)	27.5 (38.5)	373 (13%)	Family Delayers

Source: author's calculations based on GGS

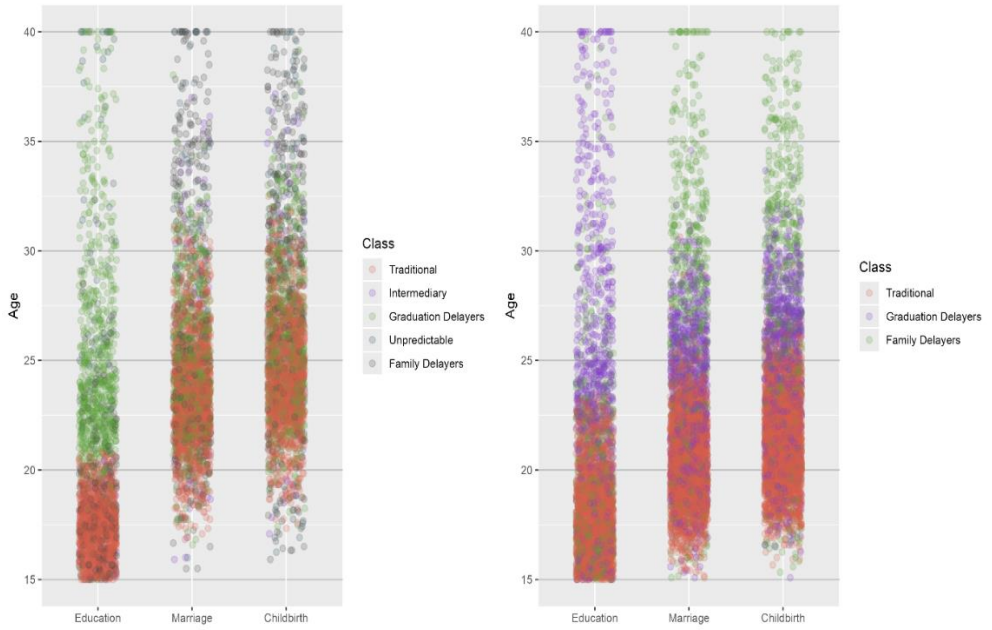

Figure 1. **The Distribution of Events by Profile for Men and Women**
Source: author's calculations based on GGS
Note: the Young Marriages and Childbirths Are the Results of Data Imputation (See Methods)

In *Figure 1*, one can see the distribution of the age of graduation of adult male profiles. The difference in dispersion is significant. The variance of 2.3 refers to an unequivocal spike at the age of 17 (which refers to secondary education), and the variance of 15.5 allows for greater differentiation, with some individuals clearly having professional (vocational) education and some even having tertiary one. Finally, the variance 50.5 implies a great variation, although with a pattern (supposedly, tertiary education). Thus, traditional profile members have an almost uniform graduation age; the family delayers have some variation, and the graduation delayers have a little pattern, although there is still a great variation.

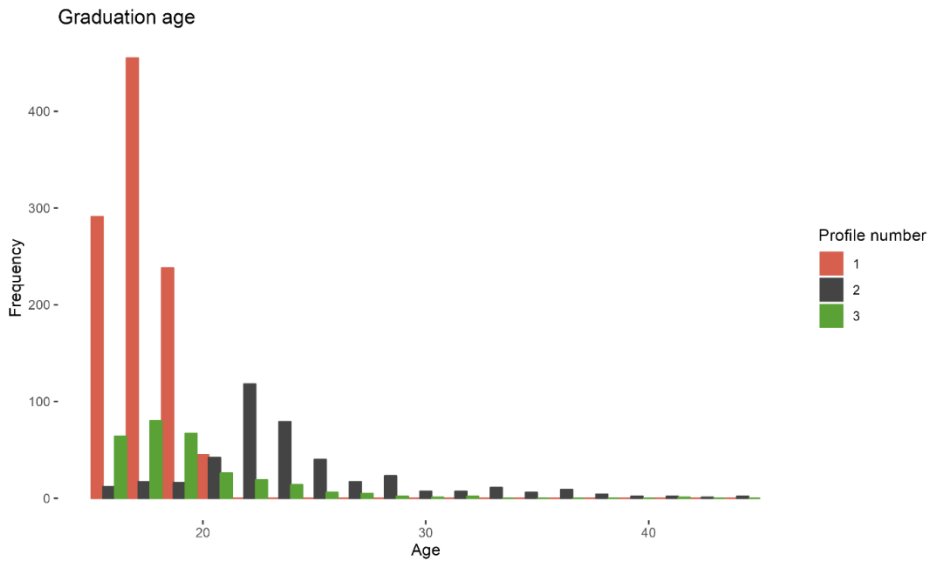

Figure 2. **The Distribution of the Graduation Age of the Male Adult Profiles**
Source: author's calculations based on GGS

While there was an implicit hypothesis that the 1990s crisis resulted in strong structural changes, some of the profiles survived it without any change. Note the female *Traditional* and *Graduation Delayers* profiles, the mean ages of which (as well as the variance) do not change substantially. The largest change for women was among family delayers who on average started to delay marriage by 1.5 years. Among these two cohorts, the shares have also not changed significantly.

The share of each profile changed over time for each cohort (see *Figure 3* and *Figure 4*). For each gender, the share of the traditional cohort increased for each cohort until the middle of the 1960s. Note, however, that those born in the middle of the 1960s had their TA completed by the beginning of the 1990s economic crisis (on average, the boundary for men is 1996, and the one for women is 1970). One of the explanations for such change is the strategy to delay marriage and childbirth. Another is the unequal propensity to migrate. Namely, those having a complex TA during the 1990s crisis may have had a higher propensity to migrate and would have not been detected by the GGS survey. For those born after the 1960s, the share of graduation delayers increased for both genders and the share of family delayers increased for women. The fluctuations for the earlier male generation are partially due to the sample size.

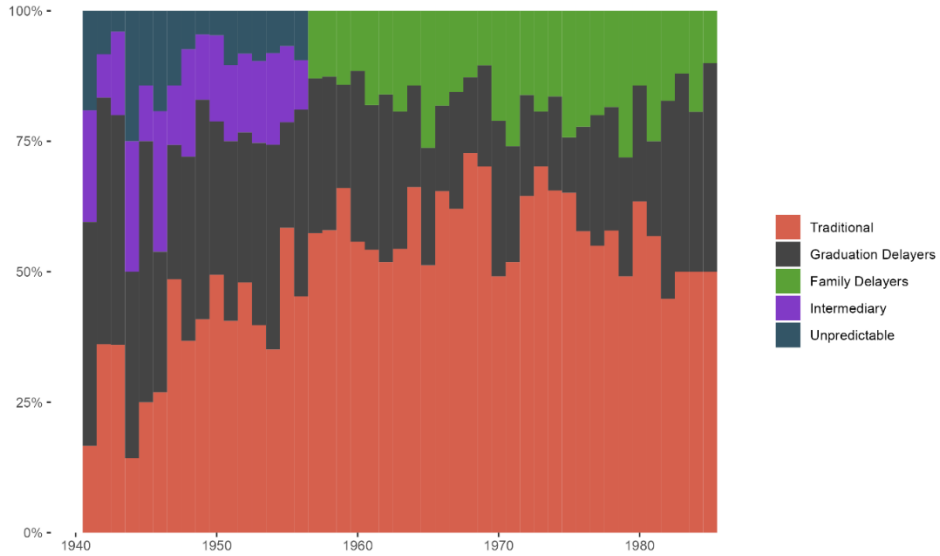

Figure 3. **The change in the shares of male profiles, by years**
Source: author's calculations based on GGS

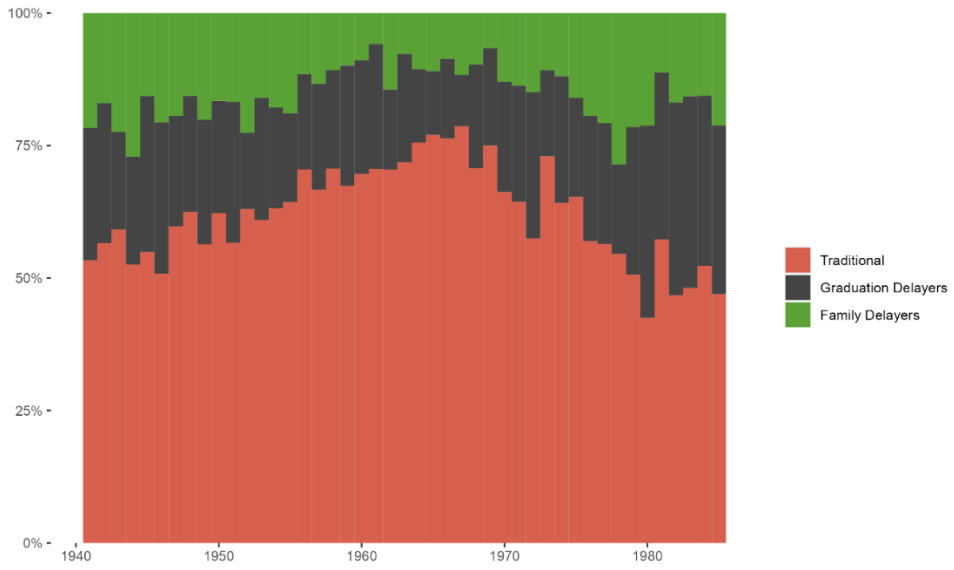

Figure 4. **The change in the shares of female profiles, by years**
Source: author's calculations based on GGS

I suggest that the Traditional profile of TA is the one with the lowest means of timing and its lowest variance. The age of traditional profile graduation is fixed across the subsamples and corresponds to secondary education. The age of marriage and childbirth is greater for men than for women but is still quite stable. There is an increase in the age of marriage and childbirth for men, but it is hard to say if this happened because of the disappearance of the intermediary profile of TA (hence,

some men with a higher age of marriage and childbirth were added to the traditional profile thus increasing the age of marriage and childbirth).

It is harder to decide on the modern profile. The *Unpredictable* profile of the old male cohort is the closest to the modern pattern of TA in terms of its unpredictability and lack of patterns. The male 1941 – 1965 cohort is the only one having this type of profile as well as the *Intermediary* profile, i.e., those between the *Traditional* and *Unpredictable* one. While I would not be surprised to find people with a modern timing of transition to adulthood, I would doubt that they only exist in the earlier generation. The profile is also absent among women.

Graduation Delayers and *Family Delayers* may be more suitable for the 'modern' label, especially since *Graduation Delayers* are present in every subsample. The term for *Graduation Delayers* may be a misnomer since many of such "delayers" may simply have tertiary education, with marriage following graduation and childbirth following marriage (see *Figure 2* which shows the distribution of the events' age for the young male cohort with the "classical" sequence of the spikes). While this is a plausible description, a different method is needed for such a conclusion (namely, sequence analysis).

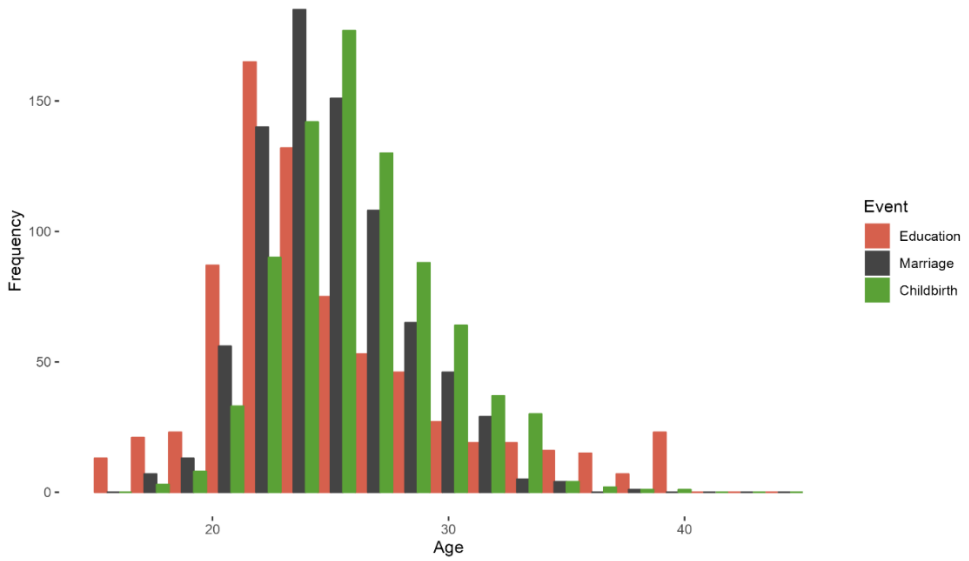

Figure 5. **The Age of Events Distribution for Graduation Delayers (young male cohort)**
Source: author's calculations based on GGS

Family Delayers are also hard to interpret. Their timing also follows the sequence suggested by Mitrofanova. However, their graduation timing suggests the domination of secondary education with some people having professional (vocational) or tertiary education. Coupled with their family formation delay, this hints at their lower economic positions. Note that for women their share increased over time peaking for the 1978 birth cohort. On average, this birth cohort's members were choosing not to get married in the period from 1996 to 2005, which does not

correspond to the harshest periods of the economic crisis. For the men, the profile had the largest share in the 1965, 1971, and 1979 birth cohorts and fluctuated quite strongly in between.

Conclusions and Discussion. In this paper, the TA patterns in Moldova were discussed. For methodological reasons, gender and birth cohort were rules to divide the sample into four subsamples. With Latent Profile Analysis, the subsamples were divided into three or four profiles. Due to the methodological problems highlighted in the Methods section, a comparison between these results and those obtained by the Latent Profile Analysis and Sequence analysis methods (e.g., Mixture Hidden Markov Model) would be profitable.

The second point of discussion that needs to be made refers to the subsampling rules. The subsampling by gender was clearly needed as the corresponding profiles' timing varied significantly. The influence of period on the sets of profiles can be found in two aspects. First, without the division by birth cohort, the difference between the early and later male cohorts would have not been seen. Specifically, the number of profiles for the earlier and the later cohorts varied. It is hard to say whether the number of profiles would have been three or four (or another) if the subsamples were united. Second, as per *Figure 3* and *Figure 4*, the shares of profiles varied. At the same time, the influence of the period on TA profiles' shares was less pronounced than expected. The women still had the same number of profiles and, moreover, they did not differ from each other much. The two male profiles that had a clear correspondence between each other also increase the doubts in such a division. A greater number of subdivisions, e.g., by 5- or 10-year birth cohorts, may answer the question of their appropriateness.

The third point of discussion refers to the appropriateness of the traditional vs. modern dichotomy in the Moldovan context. The share of those having a more complex transition increased among 1965-1985 birth cohorts. However, the graduation and family formation delays were happening in parallel. Rather than having one group of people having very unpredictable TA, we have two groups having unpredictable TA only in one aspect. This may also appear so because of the migration.

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