Appendix: Supplemental Materials

In this study, we identify clusters using a clustering algorithm (Agglomerative Hierarchical Clustering) based on Optimal Matching (OM) distances of life-course sequences. The method proceeds as follows. First, we randomly selected a subsample of 20,000 respondents that is used as training sample. We calculated the pairwise dissimilarity matrix for this subsample based on OM metric, with substitution costs based on transition rates. Second, we applied a clustering algorithm and identified four groups of trajectories. We decided on a four-cluster solution based on the visual inspection of the dendrogram (Figure A6) and the comparison of different measures of cluster performance provided by the R package WeightedCluster described in Studer (2013). Third, for each cluster we calculated a representative trajectory based on the medoid sequences, defined as the observation with the minimum distance from all other individuals in a cluster (Aassve et al., 2007). Fourth, we assigned each observation of the remaining sample to the cluster with the minimum distance with respect to the medoid sequence. In this way, we reduced the computational burden and memory requirements by calculating only distances from four representative sequences. As input of analysis, we used the entire set of variables included to construct the sequences, that is, the time-dependent indicators of life-course states from age 12 to age 30. As sensitivity analysis, we compared the summary statistics in the subsample with the entire sample (Table A3), showing comparable results. Furthermore, since the subsample is randomly chosen, we compared the cluster solutions obtained in ten independent random draws by looking at measures of classification concordance. We can safely conclude that the approximation obtained with this methodology does not affect the quality and reliability of results.
TABLE A1  Regional and sub-regional classification of countries, together with number of waves

| Americas (48)                  | Asia (39)                  | Former USSR (14)          | SSA (162)                  |
|--------------------------------|----------------------------|---------------------------|----------------------------|
| **Americas Central (21)**     | **Asia South (17)**        | **Asia Central (6)**      | **Africa Central (19)**    |
| Dominican Republic             | Afghanistan                | Kazakhstan                | Angola                      |
| Guatemala                      | Bangladesh                 | Kyrgyzstan               | Cameroon                    |
| Haiti                          | India                      | Tajikistan               | Central Africa             |
| Honduras                       | Maldives                   | Uzbekistan               | Chad                        |
| Nicaragua                      | Nepal                      |                           | Congo                       |
| **Americas South (27)**        | **Asia Southeast (22)**    | **Asia West (5)**         | **Eastern Europe (3)**     |
| Bolivia                        | Cambodia                   | Armenia                   | DR of Congo                 |
| Brazil                         | Indonesia                  | Azerbaijan                | Gabon                       |
| Colombia                       | Myanmar                    | Albania                   | Sao Tome and Principe       |
| Guyana                         | Philippines                | Moldova                   | Africa East (71)            |
| Paraguay                       | Timor-Leste                | Ukraine                   | Burundi                     |
| Peru                           | Vietnam                    |                           | Comoros                     |
|                               |                            |                           | Ethiopia                    |
|                               |                            |                           | Kenya                       |
|                               |                            |                           | Madagascar                  |
|                               |                            |                           | Malawi                      |
|                               |                            |                           | Mozambique                  |
|                               |                            |                           | Rwanda                      |
|                               |                            |                           | Tanzania                    |
|                               |                            |                           | Uganda                      |
|                               |                            |                           | Zambia                      |
|                               |                            |                           | Zimbabwe                    |
| **Africa South (9)**           |                            |                           |                            |
| Lesotho                        |                            |                           |                            |
| Namibia                        |                            |                           |                            |
| South Africa                   |                            |                           |                            |
| Swaziland                      |                            |                           |                            |
| **Africa West (63)**           |                            |                           |                            |
| Benin                          |                            |                           |                            |
| Burkina Faso                   |                            |                           |                            |
| Cote d'Ivoire                  |                            |                           |                            |
| Gambia                         |                            |                           |                            |
| Ghana                          |                            |                           |                            |
| Guinea                         |                            |                           |                            |
| Liberia                        |                            |                           |                            |
| Mali                           |                            |                           |                            |
| Mauritania                     |                            |                           |                            |
| Niger                          |                            |                           |                            |
| Nigeria                        |                            |                           |                            |
| Senegal                        |                            |                           |                            |
| Sierra Leone                   |                            |                           |                            |
| Togo                           |                            |                           |                            |

**SOURCE**: Demographic and Health Surveys.
TABLE A2  Best number of cluster solutions according to several measures of goodness of fit available in the *WeightedCluster* package (Studer, 2013).

| Index                          | Abbrv. | Best number of groups | Stat |
|-------------------------------|--------|-----------------------|------|
| Point Biserial Correlation    | PBC    | 4                     | 0.61 |
| Hubert’s Gamma                | HG     | 10                    | 0.85 |
| Average Silhouette Width      | ASW    | 2                     | 0.39 |
| Calinski- Harabasz index      | CH     | 2                     | 6932 |
| Pseudo $R^2$                  | R2     | 10                    | 0.65 |
| Hubert’s $C$                  | HC     | 10                    | 0.06 |

SOURCES: Demographic and Health Surveys.
### TABLE A3  Summary statistics from subsample used to create cluster solution compared with entire sample.

|                          | Subsample | Whole sample |
|--------------------------|-----------|--------------|
| **Age at first transition** | Mean 15.53 | 14.80 |
|                          | (SD) (4.72) | (3.72) |
| **Age at first sexual intercourse** | Mean 15.68 | 14.81 |
|                          | (SD) (4.75) | (3.66) |
| **Age at first union**    | Mean 16.63 | 15.71 |
|                          | (SD) (5.03) | (4.00) |
| **Age at first child**    | Mean 18.66 | 17.08 |
|                          | (SD) (5.23) | (3.83) |
| **Time between sex to union** | Mean 0.98 | 0.98 |
|                          | (SD) (2.12) | (2.13) |
| **Time between sex to child** | Mean 2.41 | 2.42 |
|                          | (SD) (2.48) | (2.51) |
| **Time between union to child** | Mean 1.64 | 1.65 |
|                          | (SD) (1.92) | (1.97) |

**Sample size**  
Subsample 20,000  
Whole sample 1,224,596

**SOURCES:** Demographic and Health Surveys.
FIGURE A1  Countries included in the analysis

SOURCES: Demographic and Health Surveys.
**FIGURE A2**  Average time spent in each state, by cluster of sequences

**Early Rapid Transition**

Mean time (weighted n=628629.05)

- No Sex–No Union
- Union–No Sex
- Sex– No Union
- Children

**Rapid Transition**

Mean time (weighted n=334381.93)

- No Sex–No Union
- Union–No Sex
- Sex– No Union
- Children

**Gradual Transition**

Mean time (weighted n=145260.68)

- No Sex–No Union
- Union–No Sex
- Sex– No Union
- Children

**Delayed Rapid Transition**

Mean time (weighted n=119804.94)

- No Sex–No Union
- Union–No Sex
- Sex– No Union
- Children

**SOURCES:** Demographic and Health Surveys.
FIGURE A3  Cluster prevalence, by country

SOURCES: Demographic and Health Surveys.
FIGURE A4  Most common cluster in each country by birth cohort

SOURCES: Demographic and Health Surveys.
Figure A5  Trends in Total Fertility Rate (TFR) overtime, by subregion

SOURCES: World Development Indicators (WDI), World Bank.
FIGURE A6  Cluster Dendrogram

SOURCES: Demographic and Health Surveys.
Appendix References

Aassve, Arnstein, Francesco C. Billari, and Raffaella Piccarreta. 2007. “Strings of Adulthood: A Sequence Analysis of Young British Women’s Work-Family Trajectories.” *European Journal of Population* 23: 369–88.

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