Traditional and Modern Cohabitation in Latin America: A comparative typology¹

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The existence of cohabitation is a historical feature of nuptiality in Latin America. Traditionally, cohabitation was common in less developed regions, among the lower social classes. But today, its occurrence is increasing and in social groups and regions in which it was not common. The features of this latter type of cohabitation remain unclear. We differentiate types of cohabitation in Latin America on the basis of relationship context at its outset and its outcomes in terms of childbearing. The comparability of these types over countries is attested, as well as their evolution over time and the educational and age profiles of cohabitants. Demographic and Health Survey data for the 1980s, 1990s and 2000s, for up to eight countries are analyzed by means of Multiple Group Latent Class Analysis. Three types of cohabitation are found. The traditional type includes young and lower educated women who start to cohabit during adolescence. They have more children at younger ages. The remaining two types of cohabitation included higher educated women and are considered modern. The innovative type groups women from all age groups, with fewer children born at a higher age and never as a single woman. The blended cohabitation refers to older women, who could negotiate a marriage, but they do not. They start to cohabit during adulthood, but always after single pregnancy. The persistence of historical trends is attested. It relates cohabitation to socioeconomic deprivation. However, two modern types of cohabitation also exist in Latin America, which are related to women's independence.

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1 Introduction

Patterns of family formation have changed markedly over the past decades in the West. Economic, technological, social and ideational changes have led to significant transformations in family life, such as union formation, union stability and gender relations. In developed countries, new forms of living arrangements, especially unmarried cohabitations, are interpreted as outcomes of the modernization process, female economic independence, and the rising symmetry in gender roles (van de Kaa, 1987). Recent evidence has shown that cohabitation in the West is also related to economic deprivation and has been used as an alternative to marriage by people with few economic resources or poor economic expectations (e.g Hiekel et al., 2012; Kalmijn, 2011; Kiernan et al., 2011 [for European results]; Sassler & Miller, 2011; Bumpass et al., 1991 [results for the US]).

Although the rise in consensual unions is present in developed countries as well as in Latin American countries, the features of these unions can differ. This study seeks to contribute to the existing literature by investigating the types of cohabitation which exist in Latin America, as well as their prevalence, main characteristics and evolution through time. Therefore, we differentiate types of cohabitation on the basis of the relationship context at their beginning (woman's age and occurrence of pre cohabitation pregnancy or childbearing) and their outcomes in terms of childbearing (number of children and mother's age at birth of first child).

The coexistence of marriage and cohabitation is a historical feature of nuptiality in Latin America. Cohabitation has always been marked by high fertility, it was most prevalent in rural regions and among the lower and less educated social classes (Parrado & Tienda, 1997). Today, there is evidence that another type of cohabitation is coming into existence alongside traditional cohabitation in the region (e.g. Castro-Martin, 2002; Esteve et al., 2012a). Yet, the exact interpretation of this new type of cohabitation, often characterized as a more modern type of union formation, remains unclear. Indications exist illustrating that this type of cohabitation is closely linked to the consensual union practiced by higher educated groups in Western developed countries² (Binstock & Cabella, 2011³; Parrado & Tienda, 1997⁴). In this case, cohabitation is usually a childless period, an alternative to marriage or singlehood, being more visible among younger cohorts (Heuveline & Timberlake, 2004; Kiernan, 2004). Thus, in Latin America, the choice for cohabiting instead of getting married can be related to either tradition or modernity.

Although several studies have explored different types of cohabitation in Latin America (Cabella et al., 2004; Castro-Martin, 2002; Esteve et al., 2012a; Parrado and Tienda, 1997), none of them empirically differentiate the traditional type of consensual union from modern ones. In addition, no research has been found which illustrates how these types of cohabitation develop over time in the region. This study seeks to bridge this gap by examining whether it is possible to differentiate types of cohabitation through information on union formation and childbearing. Next, it is verified how these types of cohabitation develop over time in different Latin American contexts. In addition, this study intends to assess whether the prevalence of the different types of consensual union varies across different family structures (extended, composite or nuclear), women's age and educational groups.

²For an empirical update of the meanings of cohabitation in Europe see Hiekel et al., (2012), for the United States Manning & Cohen (2012).

³Results for Buenos Aires (Argentina) and Montevideo (Uruguay).

⁴Results for Caracas, Venezuela.

For this purpose we use data about first cohabitations⁵ from Demographic and Health Survey (DHS) for eight Latin American countries (i.e. Brazil, Bolivia, Colombia, Dominican Republic, Guyana, Honduras, Nicaragua and Peru). Additionally, since these countries are quite heterogeneous in terms of colonization history, socioeconomic development and spoken language, we compare the different types of consensual unions across these countries. Before abstract constructs can be compared in a valid cross-country comparison, it must be demonstrated that the concepts are measured in an equivalent or invariant way (Horn & McArdle, 1992; Johnson, 1998). We used multiple group latent class analysis (MGLCA; Kankaras et al., 2010; McCutcheon, 2002) to test the cross-country comparability of our typology of cohabitation. Research indicates that this is the first empirical attempt to disentangle the different types of cohabitation over time in Latin America taking the issue of measurement invariance into account.

In the following section, we discuss the Second Demographic Transition (SDT) theory that is often used to explain the rise in cohabitation among higher educated groups in developed countries and its potential for the Latin American context. Next, the dataset is described as well as the operationalization of the observed indicators of different types of cohabitation and its covariates. Subsequently, the outcomes of the MGLCA-model are presented, followed by a discussion of the results and implications of our findings for the study on nuptiality in Latin America

2 Cohabitation in Latin America: Empirical evidence and theoretical explanation

⁵ The choice for first cohabitations was made because the relationship context at beginning of the relationship, as well as its outcomes in terms of childbearing, are very different for second or higher order unions, than for first unions (Brown, 2000).

Latin America has witnessed a significant increase in cohabitation since the 1970s. This increase is visible among all social groups. It includes higher social classes and higher educated women in countries where this type of union was not commonplace (Castro-Martin, 2002; Esteve et al., 2012a). This more innovative type of cohabitation has been related to women's increasing autonomy in countries where economic development is in a more advanced stage in comparison to others (Binstock & Cabella, 2011; Quilodrán-Salgado, 2011). This is the case of Argentina, Uruguay (Binstock & Cabella, 2011) and the southern regions of Brazil (Covre-Sussai & Matthijs, 2010).

Table 1 presents the evolution of the propensity of partnered women living in cohabitation instead of being married, and in several age groups for the Latin American countries covered by this study.

Age		Bolivia	L		Brazil		Colombia		Nicaragua			
group	1989	2008	$\Delta\%$	1970	2010	$\Delta\%$	1970	2005	$\Delta\%$	1971	2005	$\Delta\%$
15-19	6.1	11.6	90.2	11.5	81.1	604.6	33.6	89.4	166.0	57.9	80.9	39.8
20-24	18.8	31.4	67.0	8.3	63.2	661.8	24.2	79.7	229.1	47.5	65.9	38.6
25-29	15.7	33.8	115.3	7.5	51.0	579.6	19.7	67.4	242.9	42.8	55.5	29.6
30-34	9.4	26.2	178.7	7.1	43.4	511.0	18.2	58.3	220.3	36.0	49.4	37.0
35-39	10.2	19.3	89.2	7.0	37.5	433.3	17.7	51.2	190.1	36.1	44.4	22.8
40-44	6.8	17.3	154.4	6.7	31.9	374.3	15.9	45.2	184.1	31.8	40.9	28.6
45-49	5.9	13.9	135.6	6.1	26.6	333.5	14.6	40.5	177.6	29.6	36.5	23.3
50-54				5.7	21.8	281.0	13.2	34.7	162.8	26.6	31.4	18.0
55-59				4.6	17.4	276.5	12.5	29.6	137.5	22.5	26.9	19.4
60+				4.2	11.9	186.5	13.0	22.9	75.8	22.5	23.1	2.5
Age	Domi	nican Re	epublic		Guyana	ι	Honduras		Peru			
group	1970	2007	$\Delta\%$	2002	2009	$\Delta\%$	1974	2001	$\Delta\%$	1972	2007	$\Delta\%$
15-19	16.4	18.1	10.4	10.6	11.5	8.5	16.8	17.2	2.4	8.3	13.2	59.0
20-24	36.3	41.1	13.2	34.7	28.0	-19.3	37.4	35.9	-4.0	21.0	37.0	76.2
25-29	40.8	51.8	27.0	31.7	34.6	9.1	42.9	39.3	-8.4	22.8	44.0	93.0
30-34	39.2	54.0	37.8	29.9	33.0	10.4	42.4	37.8	-10.8	21.0	40.8	94.3
35-39	36.1	51.1	41.6	24.8	27.1	9.3	40.8	35.0	-14.2	19.9	35.2	76.9
40-44	30.7	46.0	49.8	19.6	24.3	24.0	36.1	31.3	-13.3	17.2	28.2	64.0
45-49	25.7	43.9	70.8	15.9	20.3	27.7	32.5	29.2	-10.2	15.4	22.6	46.8
50-54	21.5			12.6			26.4	25.8	-2.3	13.6	17.3	27.2
55-59	18.0			6.7			21.9	22.9	4.6	11.6	13.8	19.0
60+												

Table 1 Women living in Consensual Unions instead of in Marriages in Latin America

Source: For Brazil, Colombia and Nicaragua, IPUMS data (Minnesota Population Center, 2011), own calculations. For the remaining countries and years, World Marriage Data (United Nations, Department of Economic and Social Affairs, 2013).

This table is quite revealing in several ways. First, the increase in the propensity to live in cohabitation instead of being married is evident for almost all age groups. Second, the speed of increase is faster in countries where the incidence of consensual union was historically low. Brazil, for example, was among the countries with lower levels of cohabitation in 1970. This country presented an approximate increase of 600 percent in the incidence of cohabitation among the younger cohorts, and is recently among the countries with higher levels of cohabitation in these groups. And finally, the probability of being in a consensual union rose in all countries. Even in Nicaragua, which already presented an incidence of cohabitation as high as 58 percent in 1970, the incidence of cohabitation increased by 40 percent in three decades. Honduras is an exception and presents a decrease on the inclination to cohabit in almost all age groups.

Although new generations in Latin America are more likely to live in a consensual union, the meaning attached to this increase remains unclear. The literature on family formation and changes points to strong differences between countries and social groups. For the lower social strata cohabitation is traditionally a substitute for marriage, related to economic constraints, ethnic and gender inequality. At the same time, for the upper social classes, it has been suggested to represent possible outcomes of modernization and improved socioeconomic status of women (Binstock & Cabella, 2011; Castro-Martin, 2002; Vignoli-Rodríguez, 2005).

This leads us to the hypothesis that there are different types of cohabitation in Latin America: traditional and modern. The traditional type is related to social exclusion and inequalities while the modern type is linked socioeconomic development and can be explained by the Second Demographic Transition (SDT) theoretical framework. The SDT framework is commonly used to explain the wave of changes in norms and attitudes which have transpired in most Western developed countries since the 1960s. Since the first study on the SDT (Lesthaeghe and van de Kaa, 1987), the spread of innovative forms of living arrangements (such as cohabitation) are considered an expression of not only changing socioeconomic circumstances or expanding female employment, but also as outcomes of secular and anti-authoritarian sentiments of younger and better educated cohorts (Lesthaeghe, 2010; Surkyn & Lesthaeghe, 2004). Economic development, increasing educational opportunities, women's autonomy as well as desires for self-fulfillment and individualization are considered the main determinants of changes in demographic behavior (van de Kaa, 1987).

Although some studies suggest a division of cohabitation in Latin America in two types, traditional and modern, as well as the link between the modern type and the SDT (Binstock & Cabella, 2011; Binstock, 2010; Esteve et al., 2012a; Parrado & Tienda, 1997), an empirical differentiation between them is still lacking.

3 Traditional vs. modern types of cohabitation: an empirical hypothesis

The traditional type of cohabitation in Latin America is considered to be a result of social inequality. This type of consensual union is generally associated with a high level of fertility, a low level of female independence and a high employment rate for women in unskilled or domestic jobs. In this way, cohabitation is not considered a 'choice', but a constraint imposed upon women with relatively little bargaining power compared to men (Greene & Rao, 1995; Parrado & Tienda, 1997). As an alternative to marriage, this type of cohabitation could be considered a strategy for women to cope with the problems related to poverty, such as the need to take care of younger brothers and sisters, and single (and adolescent) motherhood (Arriagada, 2002).

At the same time, there is a lack of information about the modern types of cohabitation. It is has been related to the increasing autonomy of women in certain social groups (Binstock & Cabella, 2011; Covre-Sussai & Matthijs, 2010; Esteve et al., 2012a; Parrado & Tienda, 1997) as well as to changes in values and attitudes (Esteve et al., 2012a). However, no such study exists which empirically differentiates modern and traditional cohabitations.

Therefore, we expect traditional cohabitation to group women who cohabit at very young ages, with a higher incidence of pregnancy prior to cohabitation, bearing children at a younger age (of the mother), as well as bearing more children in general. Conversely, we expect the modern type of cohabitation to group women who begin to cohabit during early adulthood, with a lower incidence of pregnancy prior to cohabiting, bearing children at older ages (for the mother) as well as bearing fewer children in general.

We also expect the traditional cohabitants to be lower educated than modern ones, and to live within three-generation families or other types of extended households. The traditional type of cohabitation is found to be turned into marriage with time (De Vos, 2000); therefore we expect to find younger women living in this type of cohabitation. In contrast, it is expected that the modern form of cohabitation demonstrates a greater relation to higher educated women who live in nuclear families. Because these are higher educated women, they have a greater ability to provide for themselves and their children and are in less need for institutional protection. Consequently, we expect to find women from all age groups in the modern type.

4 Research Method

4.1 Data: Demographic and Health Survey

The main research questions are addressed by means of the most recent data from the Demographic and Health Survey (DHS) collected for Latin American countries. These data range from 2001 in Nicaragua to 2010 in Colombia and is labeled 2000s. DHS are nationally representative surveys which collect comparable data on demographic and health issues in developing countries (Rutstein & Rojas, 2003). The surveys focus on women in their reproductive ages (15-49 years old). Consistent data on timing and type of first unions, as well as complete childbearing histories, are available. However, information on transitions to second or higher-order relationships are not.

Considering this limitation and the fact that this is the first attempt to classify Latin American cohabitations, we decide to narrow the focus of our analysis to first unions (of women). This focus allows us to understand the relationship context when couples decide to move in together for the first time, as well as the outcomes in terms of childbearing of such unions. The focus on first unions also allows us to understand how the age profile of cohabitants changes over time.

Subsequently, we selected women who had only one relationship, who were living with the same partner at the moment of the survey. This choice indicates that only 69 percent of all cohabitations in Latin America are included in the analysis and that this proportion ranges from 83 percent in Bolivia to 65 percent of cohabiting unions in Nicaragua⁶.

Consequently, the countries and final sample sizes used in this study (2000s) are Bolivia (2008, n = 3,255), Brazil⁷ (2006, n = 2,887), Colombia (2010, n = 12,627),

⁶ Detailed information about the sample, i.e. the share of first and higher order cohabitations as well as proportion of partnered women by marital status and country is presented in the appendix 1.

⁷ The Brazilian DHS is called '*Pesquisa Nacional de Demografia e Saúde* (PNDS)' and can be found here: <u>http://bvsms.saude.gov.br/bvs/pnds/index.php</u>

Dominican Republic (2007, n = 6,773), Guyana (2009, n =823), Honduras (2005/6, n = 4,732), Nicaragua (2001, n = 2,589) and Peru (2008, n = 4,372).

In order to document how the types of cohabitation developed over the last decades, we used available information from previous DHS rounds of the 1980s and the 1990s. Included in the sample from the 1980s are Bolivia (1989, n = 749), Brazil (1986, n = 328), Colombia (1986, n = 805), Dominican Republic (1986, n = 1,775) and Peru (1986, n = 736). For the sample from the 1990s Bolivia (1998, n = 1,026), Brazil (1996, n = 1,098), Colombia (1995, n = 2,072), Dominican Republic (1996, n = 1,984) and Peru (1996, n = 6,393) are included.

In order to avoid countries with larger sample sizes to dominate the results, we used equal size weighting of the samples.

4.2 Variables

To create a typology of cohabitation in Latin America, we explored the observed variables that may have indicated these different types. Firstly, we combined information from age at start of cohabitation and age at birth of first child to identify women who had 'precohabitation pregnancy' and included it as a binary variable in the model.

Next, an ordinal variable 'age at the start of cohabitation' was created to classify women who started to cohabit when they were (1) younger than 15 years old; (2) between 16 and 19 years old; (3) between 20 and 25 years old; or (4) older than 25 years old. Then, as the variables (i) age at birth of first child and (ii) number of children are highly correlated, we combined this information to create the categorical variable 'child – age at first child'. This indicator classifies women who, at the moment of the survey, had (1) no children; (2) up to two children and the first child was born when they were younger than 20 years old; (3) up to two children and the first child was born when they were between 20 and 30 years old; (4) up to two children and their first child was born when they aged more than 30 years old; (5) more than two children and their first child was born when they were younger than 20 years old; or (6) more than two children and the first child was born when they were between 20 and 30 years old. No women responded that they had more than two children and that their first child was born when they were more than 30 years old.

Finally, three covariates are included in the analysis: 'education', which indicates women with (1) no education, (2) primary, (3) secondary or (4) higher levels of education; 'age', which separates women (1) younger than 26 years old; (2) between 26 and 36 years old and (3) older than 36 years old; and household composition, which classifies (1) nuclear families, composed by the couple and their children, (2) extended families, when other relatives also live in the household, and (3) composite families, when non-related people share the household with the family.

Listwise deletion was the method used for handling missing data. In our understanding the sample size of our data is large enough to not generate biased results due to the deletion of missing data. Descriptive statistics of all variables are included in the appendix 1 and support this supposition.

In Table 2, we summarize the variables and the expected outcomes of this study. In Table 2 our hypotheses are presented in the form of '+' and '-' which represent the direction of expected effect of each observed variable (indicators) and covariate on the latent classes (traditional and modern cohabitation).

Indicators	Traditional	Modern
Pre-cohabitation pregnancy	+	-
Age at the start of cohabitation		
Younger than 15 years old	+	-
Between 16 and 19 years old	+	-
Between 20 and 25 years old	-	+
Older than 25 years old	-	+
Children - Age at first child		
No child	-	+
1 or 2 children, mother younger than 20 years old	+	-
1 or 2 children, mother between 20 and 30 years old	-	+
Mother older than 30 years	-	+
More than 2 children, mother younger than 20 years old	+	-
More than 2 children, mother between 20and 30 years old	+	-
Covariates		
Age		
Younger than 26 years old	+	+
Between 26 and 36 years old	+	+
Older than 36 years old	-	+
Education		
No education	+	-
Primary	+	-
Secondary	-	+
Higher	-	+
Household type		
Extended	+	-
Composite	+	-
Nuclear	-	+

Table 2 Variables and hypotheses

4.3 Method

To explore the different types of cohabitation in Latin America, we conducted Multiple Group Latent Class Analysis (MGLCA). Concretely, this technique identifies a latent typology which explains the interrelations between a set of observed indicators. The classification is considered to be latent, because the variable is not observed directly (as in the case with types of cohabitation in this study). Relationships between observed indicators and the latent classes are studied in order to understand and characterize the nature of these latent types of cohabitations (McCutcheon, 1987). Detailed information about Latent Class Analysis and Multiple Group Latent Class Analysis as a strategy to attest measurement invariance can be found in the Appendix 2.

5 Results

First, as the expectation is to find more than one type of cohabitation, we contrast the goodness of fit⁸ of a model with one latent class against the models with more latent classes for three DHS rounds: the 1980s, 1990s and 2000s. Separate analysis for each Latin American country and sample show three different types of cohabitation emerging from the data⁹. Consequently we proceeded with the MGLCA. The measurement invariance results are very similar for the three DHS rounds. In order to be brief we decided to focus on the results for the most recent data: 2000s.

The Latent Class Analysis is conducted with the pooled country samples to verify whether, again, a structure of three classes emerges from the data. Because of our extremely large sample, it is not advisable to use BIC as an absolute criterion to determine the number of classes. It is an expected phenomenon that within large datasets, fit indices continue to improve (even BIC) when adding classes, leading to uninterruptable solutions. For this reason, we chose to evaluate the necessity to add a latent class by looking at the drop in BIC (see Figure 1) as well as the interpretability of the solution. If the additional classes only cause a very small drop in BIC or account for very small proportions of women, we favor a solution with fewer classes.

⁸ Because of the large sample sizes, we use the BIC as the model selection criterion, which penalizes for sample size (for more details see McCutcheon (2002)).

⁹Separate results of each country and sample are available upon request.





Figure 1 shows that the drop in the BIC starts to level off from the three classes' model. In verifying the class profiles, from a substantive point of view, we recognize that the model with three clusters has a broader difference between classes (representing 48 percent, 32 percent and 20 percent of the total sample, respectively). For the model with four classes, the first class does not change when compared with the previous model (remains at 48 percent); the second and third classes show a change in their representation, at 27 and 18 percent, respectively, and the fourth class represents only 7 percent of our sample. The fourth class also does not differ substantively from the third and second class, thus it does not add any theoretical relevance. Therefore, we decided to continue using the MGLCA with the model with three classes.

The level of measurement equivalence in the data is specified by the degree of homogeneity in the model with a better goodness of fit, namely a smaller BIC. In consonance with Kankaras et al. (2011), we first tested for measurement invariance (1); next, we verified whether each item is also invariant (2a and 2b); finally, we assessed the effect of age, educational level and household type on Latin American types of cohabitation (3a, 3b and 3c). Table 3 presents the goodness of fit for the various MGLCA which are estimated.

Test	Model	LL	BIC	Npar	df
(1)	Complete Heterogeneity	-154694.5	311382.8	193	183
Measurement	Partial Homogeneity	-94897.3	190703.7	88	288
Invariance	Structural Homogeneity	-95831.0	192064.8	39	337
(2a) Item-level	Partial Homogeneity	-94897.3	190703.7	88	288
analysis:	Pre-cohabitation pregnancy	-97317.2	195522.9	86	290
Intercept	Age at first cohabitation	-104516.7	209921.8	86	290
Invariant	Number of children and age at first child	-105156.6	211119.1	78	298
	Partial Homogeneity	-94897.3	190703.7	88	288
(2b) Item-level	Pre-cohabitation pregnancy	-98326.9	197470.0	79	297
invariant	Age at first cohabitation	-105543.0	211902.2	79	297
	Number of children and age at first child	-105715.9	211876.0	Npar 193 88 39 88 86 86 78 88 79 79 43 88 90 97 97 99 106 116 151	333
(2a) Constitution	Partial Homogeneity	-94897.3	190703.7	88	288
(3a) Covariate: Age	Age on Classes	-92267.4	185464.7	90	1038
	Age on Classes and Indicators	-86968.5	174939.1	97	1031
	Age on Classes and Indicators	-86968.5	174939.1	97	1031
(3b) Covariate: Education	Age on Classes and Indicators and Education on Classes	-85653.4	172329.5	99	4413
Education	Age and Education on Classes and				
	Indicators	-84625.2	170345.5	106	4406
	Age and Education on Classes and				
	Indicators	-84625.2	170345.5	106	4406
(3c) Covariate:	Age and Education on Classes and				
Type of Family	Indicators and Type of family on Classes	-84610.3	170418.9	116	17462
	Age, Education and Type of family on Classes and Indicators	-84411.2	170382.5	151	17427

Table 3 Goodness of Fit of the Three Latent Classes Models (2000s)

Note: LL: Log-likelihood; BIC: Bayesian information criterion; Npar: number of parameters; df: degrees of freedom.

As presented in Table 3 (1), the partially homogeneous model best fits the data (BIC=-94,897.3). This implies that the relationship between observed indicators and latent classes (i.e. slopes) are invariant over countries, while the intercepts are not. In other words, the values of the conditional response probabilities are different across countries, but the relationship between the latent type of cohabitation and the observed indicators are the same, which guarantees cross country comparability (Kankaras et al., 2011).

In order to gain better insight as to whether one of the observed indicator(s) is a source of invariance, we performed an item-level analysis. This is shown in sections 2a and 2b of Table 3, both in terms of invariance in intercept and slope parameters. In 2a, invariance in the intercept is shown, which means that the direct effect from the latent variable to the indicator is excluded from the analysis. Next, 2b attests for slope invariance, meaning that the interaction between country and the indicator was removed from the equation. The goodness of fit of both models, without interaction or direct effects, is worse than that found in the partially homogeneous model. This indicates that the source of invariance is not situated at the item level. This evidence suggests that differences within Latin American types of cohabitations are one feature of cohabitation found throughout all of the countries investigated.

Next, in order to verify whether types of cohabitation in Latin America differ according to the age group of the respondent at the moment of data collection, educational levels, and household type, we included 'age', 'education' and 'household type' as covariates in our model (sections 3a, 3b and 3c in Table 3). Comparing the goodness of fit of the partially homogeneous model to the model (3a) in which age has a direct effect on the types of cohabitation (classes), and also to the model in which age has a direct and also an indirect effect through the observed indicators on the types of cohabitation, one can see that the latter model better exemplifies the data. Similarly, the inclusion of a direct and an indirect effect of education (3b) on the indicators and on the types of cohabitation improve the goodness of fit of our model. However, neither the inclusion of a direct effect nor an indirect effect of the variable household type (3c) improved the goodness of fit of our model. As a consequence, the model shown in Table 3, section 3b is the one that best fits the data. The variable household type does not improve the model's goodness of fit and is not included in the final analysis.

These results attest that both indicators and cohabitation profiles differ according to the age and the educational level of the respondent at the time of DHS interview, but not to their household type. The inclusion of the direct effect of age at the time of the DHS interview on each type of cohabitation combined with the indirect effect of this variable controls for two potential limitations of our analysis: First, the combination of data on the age when moving in together and the age at the moment of the survey controls for the length of the cohabitation; and second, the inclusion of the indirect effect of age of the woman at data collection on each indicator of class membership (observed variables) controls for the different degrees of exposure to the risk of fertility, getting married and union dissolution related to the age of the respondent.

After identifying the types of cohabitation in Latin America and attesting their comparison over countries, the next two steps refer to a substantive interpretation of the different types of cohabitation and the comparison of class sizes across countries. First, the 'response probabilities' obtained for the better goodness of fit model (3b) for DHS data from the 2000s is shown in Table 4.

Pagnonga probabilitiag		2000s			
Response probabilities	Class 1	Class 2	Class 3		
Pre-cohabitation pregnancy					
No	0.78	1.00	0.00		
Yes	0.22	0.00	1.00		
Age at the start of cohabitation					
Younger than 15 years old	0.42	0.00	0.00		
Between 16 and 19 years old	0.58	0.17	0.06		
Between 20 and 25 years old	0.01	0.69	0.62		
Older than 25 years old	0.00	0.14	0.32		
Children - Age at first child					
No child	0.06	0.22	0.00		
1 or 2 children, mother younger than 20 years old	0.44	0.00	0.20		
1 or 2 children, mother between 20 and 30 years old	0.02	0.47	0.35		
Mother older than 30 years	0.00	0.06	0.03		
More than 2 children, mother younger than 20 years old	0.46	0.00	0.20		
More than 2 children, mother between 20and 30 years old	0.02	0.25	0.22		
Covariates					
Age					
Younger than 26 years old	0.51	0.33	0.23		
Between 26 and 36 years old	0.30	0.40	0.45		
Older than 36 years old	0.18	0.28	0.31		
Education					
No education	0.09	0.04	0.05		
Primary	0.53	0.34	0.33		
Secondary	0.35	0.46	0.47		
Higher	0.02	0.16	0.15		

Table 4 Item response and types of cohabitation probabilities

Latent class proportions			
Latin America	0.48	0.32	0.20
Brazil	0.36	0.43	0.21
Bolivia	0.40	0.30	0.30
Colombia	0.36	0.33	0.31
Dominican Republic	0.52	0.38	0.10
Honduras	0.57	0.33	0.10
Nicaragua	0.62	0.30	0.07
Guyana	0.38	0.31	0.30
Peru	0.35	0.35	0.31

Note: Entries are class profiles for MGLCA

The first class or type of cohabitation starts to cohabit at very young ages. Practically all women in this class start to cohabit before they are 20 years old (99 percent) and, among them, 42 percent moved in together younger than 15 years old. 22 percent of them were pregnant or had a child before the start of cohabitation. Most of them (90 percent) have their first child before they are 20 years old and almost half of them have more than two children at the time of the survey.

The second type of cohabitation groups women who start to cohabit in their twenties. None of them experienced single pregnancy. Women in this second class tend to have a lower fertility: 22 percent of them do not have any children and half of them have only one or two children. The third type of cohabitation groups women who start to cohabit at somewhat older ages. Most of them (62 percent) aged between 20 and 25 years old when they move in together and 32 percent of them were older than 25 years old. Women in the third class all became pregnant before they started to cohabit, 36 percent of them had children in their twenties and none of these women were childless at the moment of the survey.

Looking at the covariates one can see that the first group of cohabitants includes predominantly younger and lower educated women. Half of them (51 percent) are younger than 26 years old and 62 percent of them had completed up to primary education at the time of the survey. The second group comprises women from all ages and with higher educational profiles. The third group is characterized by older women with the same education level as women within the second class.

Comparing these results to our proposed outcomes, we can say that we have found a traditional and two modern types of cohabitation in Latin America. The 'traditional' type is represented by class 1. The striking feature of this type of cohabitation is the early age in which these women start to cohabit. They do not always start cohabitation immediately following their first pregnancy, but deliver their first child at a young age and then have more children. Only 20 percent of them are older than 30 years old, meaning that this type of cohabitation is more visible among younger cohorts.

We labeled class 2 the 'innovative' type of cohabitation. This group of women starts to cohabit in early adulthood without experiencing single pregnancy. They are older when they have their first child, and have fewer children. This is the higher educated group, where 16 percent of women in this class have participated or completed some level of higher education. The innovative type of consensual union is present in all ages, demonstrating that it is not a recent phenomenon in Latin America.

The third class was labeled 'blended' cohabitation. This type of union shares similar characteristics with both the traditional and the innovative types of cohabitation. Women in the blended type of cohabitation start to cohabit at an older age and have a similar level of education to the women in the innovative type of cohabitation. Nevertheless, all of the women in this class became pregnant before the start of their cohabitation. They also share similar fertility histories with women in the traditional type of cohabitation, being younger when delivering their first child, as well as having more children. Considering that we do not have information on the timing of education, we do not know the level of education of women living in the blended type of cohabitation at the moment of becoming pregnant and/or starting to cohabit. However, we do know that these women attained higher levels of education at the

moment of the survey and we also know that they were still living in a consensual union. Thus, we cannot say if this cohabitation was started as a traditional or a modern type of cohabitation, but our results show that it became similar to the modern types of cohabitation, as a kind of alternative to a marriage relationship.

Turning now to the comparison of latent class proportions, it is possible to identify two groups of Latin American countries. The first group is composed of South American countries: Brazil, Bolivia, Colombia, Guyana and Peru. In this group 35-40 percent of the sample belong to the class of traditional cohabitation, while 21-31 percent belong to the class of blended cohabiters and the remaining 30-43 percent belong to the class of innovative cohabitations (respective of country). The second group of countries is formed by Central American countries (i.e. Honduras and Nicaragua) and the Caribbean Dominican Republic. In these countries most of the women (52-62 percent) can be classified within the traditional cohabitation, while only 7-10 percent is classified as blended and 30-38 percent is classified as innovative cohabitants.

We finally turn to the comparison of the types of cohabitation over time. Figure 2 compares the response probabilities of the observed indicators of tree types of cohabitation for the DHS samples of the 1980s, 1990s and 2000s.





Looking at the response probabilities of the observed indicators of different types of cohabitation, one can see that the relationship context at the beginning of cohabitation, as well as their outcomes in terms of childbearing are quite similar for the three types of cohabitation over time. Data from the three DHS rounds under analysis show that, at least since the 1980s,

women in traditional cohabitation have approximately 22 percent probability of moving in together after pregnancy or childbearing. They cohabit at very young ages and have more children at younger ages than women in the remaining classes. In addition, since the 1980s, innovative cohabiters start to cohabit after their twenties, without experiencing pregnancy or childbearing, and have fewer children at older ages. Blended cohabiters present a similar profile, starting the cohabitation after the age of 20 (an increasing number of women in this class start their cohabitation older than 25 years old) and have fewer children later in their life. As stated previously, women from this group always start to cohabit after a pregnancy or childbearing.

Figure 3 illustrates the evolution of the correlation between age at the moment of the survey and the educational profile of cohabitants with the different types of cohabitation over time in Latin America.

Figure 3 Age at the moment of the survey and the educational profile of cohabitants over time (1980s, 1990s, 2000s)



Age at the data collection

■No education ■ Primary ■ Secondary ■ Higher



A noticeable change over time is attested when the analysis turns to the covariates: age and education. While in the 1980s 15, 19 and 20 percent of cohabiters who were older than 36 years old at the moment of the survey were still living in the traditional, innovative and blended types of cohabitation respectively, the figures for the same age-group for the 2000s are 18, 28 and 31 percent. It means that, although the age profile of traditional cohabitants is fairly constant over time, older women are becoming more likely to be found living in one of the modern types of cohabitation.

There is also a visible change in the educational profile of women in cohabiting unions. The proportion of lower educated women (no education and primary) in consensual unions has decreased for all types of cohabitation while the percentage of women with secondary education has increased over time. It is plausibly related to the expansion of education in the region. Interestingly, even though the proportion of higher educated women in the traditional cohabitation is almost constant over time, the proportions of higher educated in innovative and blended types has jumped from 3 and 2 percent in the 1980s, to 16 and 15 percent in the 2000s.

Finally, Figure 4 compares the evolution of the incidence of types of cohabitations in different Latin American countries over time.





The comparison of contemporary results with those from available previous DHS rounds (1980s and 1990s) shows an overall decrease in the traditional type of cohabitation combined with a general increase in the proportion of women in one of the modern types of cohabitation over time. The reduction in the incidence of traditional type of cohabitation, between the 1980s to the 2000s, ranges from 5 percent in Brazil to 17 percent in Peru.

In regard to the modern types of cohabitation, some countries experienced an increase in the innovative type while others demonstrate that the blended type is on the rise. Whereas Brazil shows an increase of 11 percent in the innovative type of cohabitation, the blended type had 10 percent growth in Colombia and 9 percent in Bolivia and Peru. At the same time, there was a decrease of 6 percent in the incidence of the blended type in Brazil. The results for the Dominican Republic show a slight increase in both types of modern cohabitation: 6 percent for innovative and 4 percent for the blended cohabitation. In sum, among the modern types of cohabitation, Brazil is the Latin American country in which the innovative type is more evident, accounting for 43 percent of all types of cohabitation in the country. The blended type has a higher incidence in the remaining Latin American countries.

6 Conclusion

Historical, socioeconomic and cultural roots make consensual unions an intriguing feature of nuptiality in Latin America. It is suggested that modernity, combined with recent socioeconomic development and existent social inequalities lead to the coexistence of different types of cohabitation in this region: traditional and modern.

This study used three rounds of Demographic and Heath Survey data to differentiate the types of cohabitation in Latin America and to document the evolution of these types of cohabitation over time. Our results point to a persistence, though with a general decrease, of the traditional type of cohabitation across the countries. It refers to half of the women in the most recent sample who started to cohabit at a younger age (often as adolescents). They experience high fertility at a young age. It is possible that these women are under social or economic pressure. Although cohabitation is not always a strategy to cope with single pregnancy, starting a new family can be seen as a means to handle other types of problems such as extreme poverty or the need to take care of household work, as well as younger brothers and sisters (Arriagada, 2002).

Two modern types of cohabitation are on the rise in the Latin America. These modern cohabitations are present in all countries under analysis and represent between 34 and 64 percent women who had cohabitation as a first union in these places. They show similar features with the cohabitation observed among higher educated people in developed countries and are consistent with the pattern described by the SDT theory. In other words, these modern types group higher educated women with lower fertility, which started to cohabit later in life.

Similar to the cohabitation found in developed countries, Latin American cohabitation is chosen by a very heterogeneous group (Bumpass et al., 1991; Hiekel et al., 2012; Sobotka & Toulemon, 2008). The traditional type is found among the lower educated groups and is probably a strategy to cope with the hardships of poverty. There is also some heterogeneity between the modern types of cohabitation. While the innovative type can represent a trial period before marriage or an alternative to singlehood, couples in the blended type are probable to cohabit as an alternative to marriage.

The same analysis was conducted with earlier DHS data (1980s and 1990s) aiming to verify the evolution of the different types of cohabitation in the region. It was shown that traditional cohabitation is giving space to the modern ones. In addition, while the age at the moment of the survey and the educational profile of traditional cohabitants are quite stable over time, the ages of women living in the modern types of cohabitation are increasing and they are also higher educated. Considering that our sample is limited to first unions, and that the average age at start of cohabitation is quite constant to these types of cohabitation over time, it is possible that these unions are lasting longer. However, the cross sectional nature of our data does not allow us to verify this assumption. To this point, it is only possible to attest an older and more mature profile of women in the modern types of cohabitation in Latin America in comparison to the traditional ones.

Besides, while the greatest increase in the majority of the countries was in the blended cohabitation, the innovative cohabitation was the type of consensual union which developed more in Brazil. Brazil is the Latin American country under analysis which has experienced the sharpest growth in cohabitation over time. The increase of cohabitation in Brazil is comparable to the one observed in the countries from the region called the Southern Cone, namely Argentina, Chile and Uruguay (Esteve et al., 2013a). These countries were not included in the analysis due to a lack of data, but there are socioeconomic similarities among them and Brazil. Therefore, considering the previous evidence about the rise of cohabitation in these countries (e.g. Binstock & Cabella, 2011; Quilodrán-Salgado, 2011) and our results about Brazil, one could expect to find higher levels of the innovative type of cohabitation in the Southern Cone as well.

The present study confirms previous theoretical arguments and gives additional evidence that the cohabitation boom in Latin America is related to increasing women's autonomy, but also to the maintained situation of women's social exclusion in the region. The identification of three types of consensual unions can help the development of efficient public policies aimed at protecting partners and children. Considering that the institutional protection required for couples living in the traditional form of consensual union is different from the protection required by couples living in the modern types, the information provided in this study can be used to develop targeted interventions aimed at these different groups of cohabiters. For example, according to our results, almost 50 percent of cohabitations in Latin America are practiced by women who form a family and have children before they are able to complete, at minimum, their secondary education. In this sense public policies are urgently needed to assist these women and their families. In addition, childbearing is related to the

three identified types of cohabitation, meaning that children's rights should not be connected to marriage.

A number of important limitations to this study must be acknowledged. First, these findings are limited by the use of a cross-sectional design, which brings some restrictions related to which specific research questions can be addressed. For instance, the absence of (at least) retrospective information on education limits the interpretation of the blended type of cohabitation, as we do not know when women in this type of cohabitation completed their education. Second, the absence of retrospective data also does not allow us to assess the stability of these consensual unions. Finally, another important drawback is related to the absence of information on values and attitudes of cohabiters, such as religious (secular) values, or the meaning given to cohabitation, which could enrich this typology enormously.

This research has led the way to proposing new research questions regarding cohabitation in Latin America. Supplementary work can be done to establish the factors related to the transition to one type of cohabitation or another. Furthermore, the meanings of the different types of cohabitation (and marriage) to couples living in these different arrangements should be analyzed in depth in future research. The analysis of the meaning given to cohabitation as well as the transitions made by these couples would certainly improve the understanding of causes and effects of cohabitation in different Latin American social groups. Additionally, considering that the so-called modern cohabitations are supposed to be discernible by egalitarian gender relations, the level of gender symmetry on each of these types of cohabitation needs further investigation. Finally, marriage also should be included in the analysis in order to verify the strength of this institution in the region and to identify who is taking advantage of its institutional protection.

7 References

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Appendix 1 Data description¹⁰

Country	First union: Marriage	First union: Cohabitation [†]	Higher order Marriage	Higher order Cohabitation	Total
	5992	3255	220	678	10145
Bolivia	59.1%	32.1%	2.2%	6.7%	100%
	5230	2887	338	1484	9939
Brazil	52.6%	29.0%	3.4%	14.9%	100%
	8346	12627	794	5629	27396
Colombia	30.5%	46.1%	2.9%	20.5%	100%
Dominican	2812	6773	619	5169	15373
Republic	18.3%	44.1%	4.0%	33.6%	100%
	4696	4732	470	1805	11703
Honduras	40.1%	40.4%	4.0%	15.4%	100%
	3226	2589	478	1375	7668
Nicaragua	42.1%	33.8%	6.2%	17.9%	100%
0	1617	823	169	368	2977
Guyana	54.3%	27.6%	5.7%	12.4%	100%
	4043	4372	218	921	9554
Peru	42.3%	45.8%	2.3%	9.6%	100%
T .' A '	35962	38058	3306	17429	94755
Latin America	38.0%	40.2%	3.5%	18.4%	100.0%

Proportion of partnered women by marital status in Latin America (2000s)

[†]: Selected sample

¹⁰ Listwise deletion for missing values

Country	First union: Cohabitation [†]	Higher order Cohabitation	Total	
	3255	678	3933	
Bolivia	32.1%	6.7%	100%	
D ''	2887	1484	4371	
Brazil	29.0%	14.9%	100%	
	12627	5629	18256	
Colombia	46.1%	20.5%	67%	
	6773	5169	11942	
Dominican Republic	44.1%	33.6%	78%	
	4732	1805	6537	
Honduras	40.4%	15.4%	56%	
	2589	1375	3964	
Nicaragua	33.8%	17.9%	52%	
0	823	368	1191	
Guyana	27.6%	12.4%	40%	
D	4372	921	5293	
Peru	45.8%	9.6%	55%	
T 1	38058	17429	55487	
Latin America	68.6%	31.4%	100.0%	

Proportion of first and higher order cohabitations in Latin America (2000s)

[†]: Selected sample

Country	No	Yes	Total
Due-il	2016	863	2879
Brazii	70.0%	30.0%	100.0%
	1818	1437	3255
Bolivia	55.9%	44.1%	100.0%
Calambia	7572	5055	12627
Colonibia	60.0%	40.0%	100.0%
Deminisen Demuklis	5452	1321	6773
Dominican Kepublic	80.5%	19.5%	100.0%
TT 1	3985	747	4732
Honduras	84.2%	15.8%	100.0%
C	511	312	823
Guyana	62.1%	37.9%	100.0%
NT'	1124	257	1381
inicaragua	81.4%	18.6%	100.0%
D	2788	1584	4372
Peru	63.8%	36.2%	100.0%
Latin America	25266	11576	36842
Latin America	68.6%	31.4%	100.0%

Latin American country by Occurrence of Pre-cohabitation pregnancy

Country	Younger than 15 years old	Between 16 and 19 years old	Between 20 and 25 years old	Older than 25 years old	Total
D 1	493	970	1022	392	2877
Brazil	17.1%	33.7%	35.5%	13.6%	100.0%
	528	1089	1238	400	3255
Bolivia	16.2%	33.5%	38.0%	12.3%	100.0%
	2164	3909	4652	1902	12627
Colombia	17.1%	31.0%	36.8%	15.1%	100.0%
	1922	2501	1999	351	6773
Dominican Republic	28.4%	36.9%	29.5%	5.2%	100.0%
	1325	1772	1365	270	4732
Honduras	28.0%	37.4%	28.8%	5.7%	100.0%
	142	293	284	104	823
Guyana	17.3%	35.6%	34.5%	12.6%	100.0%
Ъ.Т.	466	529	329	57	1381
Nicaragua	33.7%	38.3%	23.8%	4.1%	100.0%
	639	1374	1733	626	4372
Peru	14.6%	31.4%	39.6%	14.3%	100.0%
T .: A .: (, , 1)	7679	12437	12622	4102	36840
Latin America (total)	20.8%	33.8%	34.3%	11.1%	100.0%

Latin American country by Age at start of cohabitation

Country	No child	1 or 2 children, mother younger than 20 years old	1 or 2 children, mother between 20 and 30 years old	Mother older than 30 years	More than 2 children, mother younger than 20 years old	More than 2 children, mother between 20 and 30 years old	Total
Brazil	506	778	745	96	528	232	2885
DTazii	17.5%	27.0%	25.8%	3.3%	18.3%	8.0%	100.0%
Dolivia	321	881	704	63	863	423	3255
DOIIVIa	9.9%	27.1%	21.6%	1.9%	26.5%	13.0%	100.0%
Colombia	1474	3398	3324	391	2652	1388	12627
Colombia	11.7%	26.9%	26.3%	3.1%	21.0%	11.0%	100.0%
Dominican	799	1483	1232	108	2110	1041	6773
Republic	11.8%	21.9%	18.2%	1.6%	31.2%	15.4%	100.0%
Hondunos	517	1356	792	62	1408	597	4732
Honduras	10.9%	28.7%	16.7%	1.3%	29.8%	12.6%	100.0%
Guyana	98	194	159	20	239	113	823
Guyana	11.9%	23.6%	19.3%	2.4%	29.0%	13.7%	100.0%
Nicoroguo	67	365	219	17	508	205	1381
Nicaragua	4.9%	26.4%	15.9%	1.2%	36.8%	14.8%	100.0%
Dom	403	1053	1201	146	986	583	4372
Peru	9.2%	24.1%	27.5%	3.3%	22.6%	13.3%	100.0%
Latin America	4185	9508	8376	903	9294	4582	36848
(total)	11.4%	25.8%	22.7%	2.5%	25.2%	12.4%	100.0%

Latin American country by Children - Age at first child

Country	Younger than 26 years old	Between 26 and 36 years old	Older than 36 years old	Total
Drozil	1189	1109	589	2887
Drazli	41.2%	38.4%	20.4%	100.0%
Dolivio	1466	1262	527	3255
DOIIVIa	45.0%	38.8%	16.2%	100.0%
Colombia	4552	4524	3551	12627
Cololilola	36.0%	35.8%	28.1%	100.0%
Dominican	2555	2280	1938	6773
Republic	37.7%	33.7%	28.6%	100.0%
Honduras	2294	1521	917	4732
Honduras	48.5%	32.1%	19.4%	100.0%
Currene	328	290	205	823
Guyana	39.9%	35.2%	24.9%	100.0%
Nicoroguo	562	498	321	1381
Micalagua	40.7%	36.1%	23.2%	100.0%
Dom	1502	1747	1123	4372
reiu	34.4%	40.0%	25.7%	100.0%
Latin Amaniaa	14448	13231	9171	36850
Laun America	39.2%	35.9%	24.9%	100.0%

Latin American country by Age at moment of the survey

Latin American country by Educational attainment

Country	No education	Primary	Secondary	Higher	Total
Drozil	12	1718	942	136	2808
DIazii	0.4%	61.2%	33.5%	4.8%	100.0%
Dolivio	138	1791	1072	254	3255
Bolivia	4.2%	55.0%	32.9%	7.8%	100.0%
Calambia	368	3953	6385	1921	12627
Colombia	2.9%	31.3%	50.6%	15.2%	100.0%
Dominican	400	3234	2332	807	6773
Republic	5.9%	47.7%	34.4%	11.9%	100.0%
	444	3373	857	58	4732
Honduras	9.4%	71.3%	18.1%	1.2%	100.0%
Concerne	25	217	549	32	823
Guyana	3.0%	26.4%	66.7%	3.9%	100.0%
Nicoroguo	343	651	342	45	1381
Micaragua	24.8%	47.1%	24.8%	3.3%	100.0%
Deme	182	1499	1877	814	4372
Peru	4.2%	34.3%	42.9%	18.6%	100.0%
Letin America	1912	16436	14356	4067	36771
Laun America	5.2%	44.7%	39.0%	11.1%	100.0%

Appendix 2 Multiple Group Latent Class Analysis

The general Latent Class model proposed in this study can be expressed through Equation 1 (McCutcheon, 2002, p.58).

$$\pi_{ijklt}^{ABCDX} = \pi_t^X \pi_{it}^{A|X} \pi_{jt}^{B|X} \pi_{kt}^{C|X} \pi_{lt}^{D|X} , \qquad (1)$$

where A, B, C and D represent the observed indicators and, i, j, k and l represent their respective categories. X refers to the latent classification variable, which has t classes. The model contains two types of parameters, namely conditional probabilities and latent class probabilities. Conditional probability, $\pi_{it}^{A|X}$, is the probability to be located in the category (i) of the observed variable (A), given that the individual is member of the latent class (t). The conditional probabilities indicate how likely a category of the observed variables is to be reported by the members of the different classes. As such they designate the strength of the association between the latent classes and the indicators. Latent class probabilities π_t^X represent how the observations in the sample are distributed over the latent typology (McCutcheon, 2002).

Because we use DHS data from eight countries and we want to compare the latent class model among those eight countries, we have extended our latent class model to a multiple group latent class (MGLCA) model. This implies that a grouping variable (namely by country) is added, and that latent class parameters (i.e. conditional probabilities and latent class probabilities) can be estimated for the groups separately. Equation 2 formalizes the general MGLCA model (McCutcheon, 2002, p.77).

$$\pi_{ijklts}^{ABCDXG} = \pi_s^G \pi_{ts}^{X|G} \pi_{its}^{A|XG} \pi_{jts}^{B|XG} \pi_{kts}^{C|XG} \pi_{lts}^{D|XG}$$
(2)

Here, (s) indicates the membership of the grouping variable (G) and the conditional probability of class membership is now conditional on group membership. The model formalized in Equation 2 is called the heterogeneous model, since conditional probabilities as well as latent class probabilities are allowed to vary across groups. In this situation, however, it is not possible to make valid comparisons of the results across groups.

In order to compare the latent classification across groups, it is necessary to test whether measurement invariance (or equivalence) is present. By imposing cross-group equality restrictions on conditional probabilities, various levels of measurement equivalence can be assessed (Kankaras et al., 2011). Concretely, testing for measurement equivalence involves testing whether a model is completely homogeneous, structurally homogeneous or only partially homogeneous, against the hypothesis that it is completely heterogeneous.

Figure 5 contains a graphic representation of these various levels of measurement equivalence, ordered from less to more restrictive.

Figure 5 Levels of Measurement Invariance



(d) Complete Homogeneity

Note: Based on the illustration proposed by Kankaras et al. (2011), p.367.

The complete heterogeneity model (Figure 5a) is the model described in equation 2, and assumes no equality of parameters across the groups (in our case Latin American countries). The partial homogeneity model (Figure 5b) restricts the relationships between the latent variable and the observed variables (slopes) to be the same, but allows for groupspecific conditional response probabilities (intercepts). In the structurally homogeneous model (Figure 5c), both intercept and slope parameters are constrained to be the same across groups. This model implies that distributions of the observed variables within the latent classes (i.e. conditional probabilities) are independent of the grouping variable (countries). Latent class probabilities (i.e. the distribution of different types of cohabitation in the population), however, are still allowed to vary over groups. Finally, in the complete homogeneity model (Figure 5d), all parameters are restricted to be equal across groups, indicating that there is no group difference in terms of intercepts, slopes and class size (Kankaras et al., 2011). Since we want to verify differences across groups, the complete homogeneity model is less relevant for this study.

This MGLCA framework is particularly relevant for the research question at hand: It will identify whether different types of cohabitation (latent classes) exist. These cohabitation types are not observed directly, but inferred from interrelations between observed characteristics such as the age at start of cohabitation and the number of children. The typology of cohabitations will then be compared over eight Latin American countries (groups). Before this comparison can be made, however, measurement equivalence will be tested applying the procedure proposed by Kankaras et al. (2011, pp.367-374)¹¹. Following this procedure, the number of latent classes should be firstly determined for each group separately and then to the pooled data with all countries together in the same dataset. If the number of latent classes is the same for each country and the pooled data, the heterogeneous model is fitted to the data as a baseline model. Next, a series of nested models is tested in which equality restrictions are applied. These models are evaluated in terms of model fit and comparability is attested if the restrictions do not deteriorate the model goodness of fit. Subsequently, we perform an item level analysis to guarantee that the observed indicators are not sources of invariance. Finally the covariates (type of household, age and education) are introduced in the model (Kankaras et al., 2011).

¹¹ Models were estimated with the Latent Gold 4.5 program (Vermunt and Magidson, 2008).