DEMOGRAPHIC RESEARCH

Research Article

Heterogeneity among the never married in a low-fertility context

Jolene Tan

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Jolene Tan[1]

Abstract

BACKGROUND
While there has been extensive research on trends in marriage and singlehood, few studies have examined heterogeneity among never-married individuals in a low-fertility context. As a country that has experienced a steady decline in marriage and an accompanying rise in singlehood, Singapore presents a compelling context in which to study the singlehood phenomenon.

OBJECTIVE
This study aims to understand variations in the never-married population based on their family-related attitudes. It seeks to classify the never married into subgroups and examine how these groups relate in terms of their sociodemographic traits and marriage desires.

METHODS
Using data from the Perceptions of Singles on Marriage and Having Children study (N = 1,980), latent class analysis was performed to develop a typology of the never married. Latent class analysis applies a person-centered approach to identify heterogeneity between and homogeneity within subgroups based on associations among a set of observed indicators.

RESULTS
Four never-married subgroups were identified: family conservatives (37%), conflicted conservatives (24%), family progressives (22%), and family skeptics (17%). There were distinct characteristics among subgroups in terms of age, sex, and relationship status. A strong gradient in marriage desires was found across the never-married subgroups, implying that variations between subgroups are an important determinant of the desire to marry.

CONCLUSIONS
The paper highlights the importance of recognizing diversity among the never-married population as a first step to understanding the flight from marriage.

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CONTRIBUTION
These findings have implications for societies with declining marriage and fertility rates, especially in contexts where marriage is closely linked to childbearing.

1. Introduction

Marriage and childbearing are on the decline in most developed countries (Balter 2006; Sassler and Lichter 2020). In Asia, the lowest fertility rates are found in Japan, South Korea, Hong Kong, and Singapore, where the total fertility rate in 2019 plummeted to 1.36, 0.92, 1.05, and 1.14, respectively (Hong Kong Census and Statistics Department 2020; Singapore Department of Statistics 2020a; Statistics Bureau of Japan 2020; Statistics Korea 2020). In these countries, childbearing almost exclusively takes place within marriage. The percentage of births outside marriage is less than 2% in Singapore, South Korea, and Japan, compared to the Organisation for Economic Co-operation and Development average of 41% (OECD 2017). The continued link between marriage and parenthood is a particularly distinctive feature of Asian societies (Raymo et al. 2015). Thus the rise in the proportion of singles accounts for a substantial part of the decline in birth rates and is unlikely to be influenced by pronatalist incentives (Chen, Gietel-Basten, and Yip 2020). Consequently, fertility has declined in concert with the changes in marital composition observed in many societies.

Given that marriage is a proximate determinant of fertility in ultra-low-fertility Asian countries, it is conceptually and theoretically important to explain the underlying variations and dispositions concerning marriage among the never married as a first step to understanding the flight from marriage (Jones 2007). Past research has argued that these trends may be attributed to underlying shifts in demographic and socioeconomic structures that have impacted marriage markets, as well as changes in attitudes toward the perceived benefits and costs of marriage and childbearing (Boling 2008; Brinton and Lee 2016; Raymo and Park 2020; Sobotka, Skirbekk, and Philipov 2011). A focus on the never-married population at an aggregate level, however, obscures inherent differences within the population. Crucially, variability in subtypes of never-married men and women, as well as their propensities to marry, has not received much scholarly attention, even though it is crucial for explaining changes in marriage patterns. A recent study by Raymo, Uchikoshi, and Yoda (2021) demonstrates that classifying the never married into three different singlehood pathways is useful for understanding increased rates of lifelong singlehood in Japan. In fact, without further dissection of the never-married population into subgroups, conclusions about the population assume that the never married are essentially the same or homogeneous (Arocha 2021). For this reason, group-level

comparisons and generalizations of the intrinsically heterogeneous never-married population remain relatively limited (Fisher, Medaglia, and Jeronimus 2018). The study of within-group individual-level variability is therefore of particular importance for improving our understanding of the composition and marital dispositions of the never married (Arocha 2021).

The flight from marriage is particularly striking in Singapore. The median age of grooms and brides at first marriage rose from 26.7 to 30.4 for men and from 23.6 to 28.8 for women from 1980 to 2019 (Singapore Department of Statistics 2020b). In 2020, 81.6% of the male and 69% of the female resident population at ages 25 to 29 were single, 41.9% of the male and 32.8% of the female resident population at ages 30 to 34 were single, and 22.6% of the male and 19.3% of the female resident population at ages 35 to 39 were single (Singapore Department of Statistics 2020b). These percentages were much higher when compared to previous years, implying that marriage is no longer universal. More significantly, the highest percentage of women who were still single were in their peak fecundity years of 25 to 29. The link between marriage and parenthood is strongly evident in Singapore, considering that less than 1% of births occurred outside of marriage in 2019 (Singapore Registry of Births and Deaths 2019). Nontraditional family forms, including unmarried cohabitation, nonmarital births, and same-sex unions, are uncommon. Singapore is characterized by a combination of continuity in traditional marital patterns and an emergent new trend of singlehood. The country thus presents a compelling context in which to investigate the singlehood phenomenon, as the upshot of non-marriage is directly linked to the country's overall fertility rate.

This study uses latent class analysis (LCA) of data collected from Perception of Policies in Singapore (POPS) Survey 6 – Perceptions of Singles on Marriage and Having Children – to classify never-married individuals into distinct groups based on their response patterns to a wide range of family-related attitudinal questions. At the same time, the effect of age, sex, relationship status, educational attainment, and ethnicity on group membership was examined and controlled for. Group membership was used to predict marriage desires. This study focuses on marriage desires, as it has been documented that they are strongly associated with the eventual outcome of marriage (Waller and McLanahan 2005). The measure of marriage desires aligns with the interest of this study as it corresponds more closely with the perceived desirability of a particular behavior than with actual measures of behavior outcomes (Hiekel and Castro-Martín 2014). This study found substantial variability in the never-married population and gradation differentials in marriage desires in a low-fertility setting where marriage is inextricably linked to childbearing. The findings of this study are discussed within the context of significant delays and declines in marriage and fertility in Singapore, with implications for Singapore and other countries where rigid family and gender norms trail behind rapid social and economic changes.

2. Past literature and current study

2.1 Family-related attitudinal domains

Previous research has shown strong links between changes in attitudes toward different aspects of family life and family-formation behavior (Ajzen and Klobas 2013; Choe et al. 2014, Raymo, Uchikoshi, and Yoda 2021). Attitudes are conceived as inherent dispositions and the first immediate determinant of intention and subsequent behavior (Ajzen 1985, 1991; Miller and Pasta 1995). Consistent with this theoretical explanation, earlier studies in Western societies have shown that attitudes across a broad spectrum of family issues, including gender roles, marriage, parenthood, unmarried cohabitation, and nonmarital sex, are considered to be essential antecedents to family-formation behavior (Poortman and Liefbroer 2010; Thornton and Young-Demarco 2001). Cross-national studies have shown a general shift in family-related attitudes away from the pro-marriage and pro-natalist norms of the traditional patriarchal nuclear family toward greater acceptance of alternative forms of partnership and a more egalitarian view on gender relations (Boehnke 2011; Gubernskaya 2010; Yucel 2015). Changes in family-related attitudes may be reflective of the rise of post-materialism, orienting individuals away from marriage and children in favor of a career or personal freedom (Inglehart and Baker 2000; Thornton 1989). However, previous studies have highlighted the need to account for individual variation in specific national contexts (Gubernskaya 2010; Treas, Lui, and Gubernskaya 2014). For example, using pooled data from six countries to investigate change in attitudes toward family formation, Gubernskaya (2010) found that significant cross-country differences in attitudes remain unexplained once adjusted for individual-level characteristics, including gender, marital status, education level, employment status, and religiosity.

Specific to the Asian context, there appears to be a gradual shift in attitudes about the centrality of children in marital unions and about gender roles within the family (Raymo et al. 2015). For instance, according to the Japanese National Fertility Survey, 67% of single women in 2015 agreed with the statement that one should have children once married, compared to 85% in 1992. Likewise, 29% of single women in 2015 agreed with the statement that husbands should work and wives should take care of the household after marriage, compared to 32% in 1997 (National Institute of Population and Social Security Research 2017). Despite this shift, the majority of women in Japan still hold a favorable attitude toward family and the institution of marriage (Yoshida 2017). Similarly, singlehood trends in China are detraditionalizing, with nonmarital sex and cohabitation before first marriage becoming gradually more acceptable (Yu and Xie 2015; Zheng et al. 2011). Notwithstanding the increasing personal autonomy and individualism among young Chinese adults, marriage desires and traditional attitudes

regarding family lineage and continuity remain relatively strong in China (Yeung and Hu 2016).

On the other hand, Jones, Zhang, and Chia (2012) contend that the shift in attitudes toward greater acceptance of cohabitation and premarital sex, increasing emphasis on independence and self-actualization, and decreasing desirability of marriage and children in Singapore may have led to a greater acceptance of singlehood, contributing to the trend toward later and fewer marriages. Their research found a growing acceptance of unmarried cohabitation and premarital sex and a weakened desire for marriage and children. In particular, singles in Singapore tend to focus on their careers and emphasize independence and freedom more than marriage and family (Jones, Zhang, and Chia 2012). Compared to Asian countries where parental influences on adult children's marriages are still quite strong, the social and familial pressure to marry is relatively weak in Singapore (Himawan, Bambling, and Edirippulige 2018; Jones, Zhang, and Chia 2012). Thus individual attitudes toward marriage (and its alternatives), children, and the work–life interface appear to be most relevant to aspects of family formation in Singapore. While the broader literature has emphasized the influence of these individual attitudes on the postponement and rejection of family formation, little empirical evidence is available to explain the heterogeneity in attitudes among singles in Singapore. Therefore the present study aims to fill this gap in the literature by examining five salient domains of family-related attitudes, including marriage and family, cohabitation and premarital sex, parenthood, work–family roles, and gender roles, to uncover similarities and dissimilarities among the never married.

2.2 Interrelationships among attitudes

Extant literature in attitude theory has identified attitudes as a crucial antecedent of family-formation desires, intentions, and eventual behaviors (Ajzen and Klobas 2013; Fishbein and Ajzen 1975). These attitudes are the positive or negative dispositions toward an object or position through which individuals interpret the symbolic meaning of their interactions and relationships with others. Attitudes hence make up an individual's family orientation and influence intentions toward marriage and parenthood (Ajzen 2001; Balbo, Billari, and Mills 2013; Davis and Greenstein 2009; Willoughby, Hall, and Luczak 2015). Empirical evidence has supported some hypotheses from the literature regarding the influence of attitudes on marriage behaviors. For instance, individuals who hold traditional attitudes about marriage and family are more likely to marry and tend to marry early (Tai, Yi, and Liu, 2019; Treas, Lui, and Gubernskaya 2014). Two meta-analyses of attitude–behavior research have shown that attitudes, mediated by behavioral intentions

and desires, strongly influence actual behavior (Cooke and Sheeran 2004; Kim and Hunter 1993).

However, the link between attitudes and marriage desires remains relatively obscure, as favorable perceptions of marriage may not necessitate a preference for marriage in the presence of constraints, and social pressure may subvert individual resolve to stay single (Himawan 2019). Prior empirical research focusing on a single attitudinal dimension or viewing attitudes as unrelated to or independent of one another may not adequately address the complex interrelationships among sets of family-related attitudes (Muthén and Muthén 2000). This may be partly because past research using variable-centered approaches primarily focused on drawing associations between variables of interest to summarize a population, operating under the assumption that all individuals are sampled from a homogenous population for which a single set of averaged parameters can be estimated (Morin, Gagné, and Bujacz 2016).

Accordingly, the variable-centered framework may not be ideal for understanding population heterogeneity as it does not attend to the possibility that the sample may comprise multiple subpopulations characterized by different sets of parameters. A unidimensional scale measuring a single domain may not fully reflect an individual's overall disposition toward family formation, as attitudes are interrelated and are not entirely isolated from one another. The construction of scales – through additive measures, factor analysis, or principal components analysis – may not account for the relationships between attitudes or produce results with distinguishable interpretations. Factor analysis, for instance, condenses a large set of variables down to smaller dimensions by identifying correlation patterns for the sample as a whole but does not capture commonalities or differences among respondents. Likewise, principal components analysis identifies a specific combination of questions that explains the most variance in the entire sample but does not account for diversity within the sample.

While most previous studies have adopted the dominant variable-centered approach to describe or model attitudinal factors generated based on the shared variance among a set of indicators (Fuwa 2014; Li et al. 2015; Treas, Lui, and Gubernskaya 2014), the average presentation of attitudes may result in overgeneralized conclusions about the population. For example, Li et al.'s study (2015) suggests that Singaporeans' materialistic values have led to negative attitudes toward marriage and children. However, the conclusions drawn based on how, on average, materialism would negatively influence attitudes toward marriage and children may not accurately sum up the population, given that individuals with different levels of materialism may have different attitudes about marriage and children. Another potential shortcoming of this approach is that it may be insufficient in explaining an individual's overall orientation toward family formation because it does not account for the complex interrelations between various indicators that

give a sense of the individual as an integrated whole who functions and develops as a totality (Bergman and Magnusson 1997; Magnusson and Stattin 2006).

In contrast to a conventional variable-oriented approach, a person-oriented approach that considers response patterns across diverse sets of attitude indices capturing different family-related dimensions may provide a more holistic understanding (or gestalt) of an individual's overall orientation toward marriage. Several types of person-centered approaches can help us better understand population heterogeneity. For cross-sectional studies, latent class and latent profile analyses are typically used to identify common subgroups in a population based on a set of indicators, and subsequent analysis can examine how these subgroups are related to predictors and outcomes (Collins and Lanza 2013). LCA uses categorical indicators (nominal or ordinal), and latent profile analysis uses continuous indicators. For longitudinal data, latent transition analysis and growth mixture models allow further investigations into changes in classes, profiles, or trajectory groups over time (Collins and Lanza 2013; Meyer and Morin 2016).

Recent empirical studies have taken a person-centered approach to examining women's childbearing worldviews (Shepherd and Marshall 2019) and changes in gender role expectations (Barth and Trübner 2018). Both studies employed LCA to address questions that involve understanding qualitatively diverse attitudinal dimensions that cannot easily be reduced to a single population distribution. The studies reveal substantially diverse subgroups in populations of young women and adults that would not have emerged using a traditional variable-centered approach. For example, when variable-centered methods were used in a study exploring marriage attitudes among Indonesian singles (Himawan 2019), the findings suggest that, in general, most singles preferred marriage over singlehood. However, without a way to distinguish between different types of singles, limited conclusions can be drawn about different subgroups of singles and their intentions to marry. Recognizing the importance of variability among the never-married population, Raymo, Uchikoshi, and Yoda (2021) classified singles in Japan into three predefined marriage-desire trajectory groups to examine their pathways to later and fewer marriages. While this approach better accounts for variability, predetermined groups may not always represent or fit the data. An inductive technique such as LCA can help reduce misclassification and differentiation challenges as it relies on multiple fit statistics and theoretical interpretability to select the optimal number of subgroups in the population. The maximum-probability assignment rule is used to assign individuals to subgroups for which they have the highest probability of membership, ensuring appropriate classification accuracy (Collins and Lanza 2013). Despite its methodological merits, no studies to date have used LCA to explain variations among the never-married group, and most previous studies have relied on variable-centered methods to analyze the never-married population as a whole or have classified them based on predefined categories.

In sum, the variable-centered approach is more suited for analyzing the effects of one variable on another as it uses averaged parameters to describe a population. Conversely, the person-centered approach is more helpful in identifying emergent subgroups and explaining the relations of these subgroups with predictors or outcomes by considering interrelationships among multiple sets of parameters (Howard and Hoffman 2018). The present study attempts to address the limitations of prior studies that view individuals or attitudes as separate elements by simultaneously analyzing the interrelationships between and within various attitudinal domains. Attitudinal responses considered in relation to one another provide important intrapersonal context and insight, revealing one's life experiences and basic life orientation. The unique dataset used in this study includes a series of detailed questions on attitudes across different domains of family life, presenting an opportunity to inductively capture emergent never-married subgroups in the data.

Based on the associations between individuals' attitudes in different domains, further theoretical insights into processes influencing family and marriage decisions may be developed by examining how groups of never-married people differ in their association with marriage desires. For example, individuals may hold negative attitudes toward marriage but positive attitudes toward childbearing. This might point to a new divergent family ideology, where people may reject marriage but still want children. A clearer picture of variations among the never married can be obtained by taking a person-centered approach. In complement to previous research on the flight from marriage in contemporary societies, developing an empirically grounded typology based on individual response patterns across a set of family-related attitudes provides a way to explain underlying marital dispositions. This study's findings may help generate new hypotheses for future research in similar low-fertility settings. The extent to which these subgroups are reflected in other populations of interest opens a new line of inquiry and allows cross-country comparisons to be made.

2.3 Theorizing variations in the never-married population

The second demographic transition (SDT) theory has advanced into many urban and industrialized societies. However, recent scholars have cautioned that the SDT theory does not sufficiently consider intracountry variation in demographic trends (Zaidi and Morgan 2017). The SDT theory posits that the rise in singlehood reflects cultural shifts toward Western postmodern attitudes and norms that emphasize individualism, liberalism, and personal autonomy (Lesthaeghe 2010; Surkyn and Lesthaeghe 2004; van de Kaa 1987). This shift in values is made possible by the material emancipation afforded by modern progress and increasing prosperity (Inglehart 1977). These values have been

shown to be associated with increases in singlehood, divorce rates, unmarried cohabitation, nonmarital sexual relations and births, and a decreased preference for children. In an era of postmodernity, individuals may have less regard for societal expectations surrounding marriage, particularly if these expectations conflict with personal preferences and plans. Aside from cohabitation and childbearing outside of marriage, the adoption of postmodern attitudes and other forms of behavior are thought to have spread to Asian developed societies, eroding the symbolic and normative importance of marriage (Jones 2005, 2012). In line with suggestions that the SDT theory may not adequately address within-country differences (Zaidi and Morgan 2017), this study posits that only a subset of voluntary singles hold the less traditional attitudes toward marriage, cohabitation, and parenthood that correspond with the SDT theory. This group will be referred to as family skeptics (Hypothesis 1a).

Conversely, some scholars working in low-fertility Asian contexts (Jones and Yeung 2014; Raymo et al. 2015) argue that ideational change may not serve as the main driving factor behind changing marriage patterns in Asia. The flight from marriage is viewed as a societal phenomenon related to the changing structure of social institutions coupled with the persistence of traditional family systems (Takeuchi and Tsutsui 2016). Lesthaeghe (2020) stresses that despite major changes in marriage and fertility patterns, the patriarchal system in Asia has not been "corrupted." In Asian countries with large proportions of ethnic Chinese, the traditional cultural values espoused by the Confucian philosophy have been most influential in shaping patterns and structures of the family (Koo 2019; Sim and Chow 2019). The dominant familial tradition holds that the family constitutes the central pillar of society. Family continuity and cohesion are viewed as the foundation for preserving the community, culture, and people (Ofstedal, Knodel, and Chayovan 1999). Patrilineal ideology is largely prevalent, as children take on the family name of their father, inheritance customs tend to favor children of sons more than children of daughters, and agnatic kin are viewed as more closely related compared to the matrilateral side of kin relations (Hassan and Benjamin 1976; Murphy, Tao, and Lu 2011). The strong cultural tradition of familism underlying existing family systems and the entrenched patriarchal tendencies seem to still be present in Singapore (Lim 2019). This study therefore expects to find singles who hold more traditional and positive attitudes toward marriage and parenthood. This group will be referred to as family conservatives (Hypothesis 1b).

As increasing proportions of women achieve higher education and participate in the labor force, traditional family and gender role attitudes have come under significant challenge, both as an ideology (Esping-Andersen and Billari 2015; Goldscheider, Bernhardt, and Lappegård 2015; McDonald 2000) and as a practice (Oshio, Nozaki, and Kobayashi 2013; Sayer, Bianchi, and Robinson 2004). The traditional concept of patriarchy, which supports the male breadwinner and female homemaker model, runs

counter to advancements in women's socioeconomic status (Koo 2019). Under these circumstances, women are simultaneously expected to perform traditional gender roles that fulfill their domestic responsibilities and, at the same time, contribute to the labor force. The immutability of gender roles places significant pressure on women, who may have to choose between a marriage and a career. Jones and Yeung (2014) suggest that changes in women's marriage attitudes seem to be linked to the conflicts and dilemmas posed by traditional gender norms in a changing economy rather than the rise of individualism. On the one hand, individuals may choose to reduce the dissonance by retraditionalizing their attitudes and rationalizing the decision to marry at the expense of a career (Davis and Greenstein 2009). On the other hand, individuals may decide to postpone or forgo marriage altogether to align with their career ambitions (Barber 2001). This apparent incompatibility between work and family life may result in significant role conflict between one's professional and personal roles (Greenhaus and Beutell 1985). This study thus posits singles who hold relatively traditional attitudes toward marriage and parenthood but perceive the demands and responsibilities of the work and family spheres as mutually incompatible. This group will be referred to as conflicted conservatives (Hypothesis 1c).

2.4 Sociodemographic characteristics and the never married

Previous studies that have taken a life course perspective have shown that attitudes toward family formation can change over time (Gray, Evans, and Reimondos 2013; Kim and Cheung 2015). For example, Kim and Cheung (2015) found that Korean women tend to adopt more traditional family and gender attitudes after marriage and parenthood. The findings suggest that life stage transitions, such as changes in relationship status, may influence an individual's family-formation attitudes. Another study, analyzing childless individuals in Australia, finds that age is strongly associated with adjustments in family-formation attitudes and desires (Gray, Evans, and Reimondos 2013). Older individuals tend to revise their attitudes and expectations downward if they perceive that their family aspirations are unlikely to materialize. Based on previous findings, the current study posits that older singles are more likely to hold skeptical attitudes toward family formation (Hypothesis 2a). In contrast, singles in a relationship are less likely to be skeptical because the prospect of family formation appears more attainable (Hypothesis 2b). It is important to note that the aforementioned life course studies are based on within-individual differences, but this study looks at between-individual differences given the use of cross-sectional data. Nonetheless, the links between age or relationship status and never-married groups can provide insights into the attitudes of singles at different life stages.

There are also potential gender differences in family-formation attitudes (Choe et al. 2014). Earlier studies of singles in Singapore suggest that women may hold more egalitarian gender role attitudes that are at times incongruent with the traditional ideals of marriage and family (Strijbosch 2015). The work–family tension experienced by women is often amplified in patriarchal societies such as Singapore, where women are expected to excel in both their careers and domestic lives, leading to discordant or negative attitudes toward family formation (Chan 2000). Meanwhile, men's attitudes tend to align with the normative gendered expectations and practices embedded in patriarchal social structures (Lim 2020). Given the gender relations between men and women, it is hypothesized that a larger proportion of men will belong to the family conservatives group, as they are likely to support the tenets of the traditional family system (Hypothesis 2c). In contrast, women are more likely to be conflicted conservatives or family skeptics, as they tend to perceive stronger work–family conflict from assuming multiple roles within and outside the family (Hypothesis 2d).

Previous evidence on the effect of education on family-formation attitudes in Asia has been inconclusive. Jones, Zhang, and Chia (2012) suggest that some highly educated singles in Singapore seem to hold attitudes consistent with the SDT theory in terms of increasing individualism and being less concerned with meeting societal expectations. In contrast, Kim and Cheung (2015) found no significant association between educational attainment and family-formation attitudes among Korean women. The authors surmise that strong family values and gender norms are embedded in both private and public institutions, including the education system. Therefore having more education may not expose individuals to markedly different sets of values (Kim and Cheung 2015). The conjecture is somewhat consistent with Singapore's education efforts, as traditional family values are embodied in school curricula and are taught "in the context of mainstream national values," with a key emphasis on promoting "abstinence before marriage" (Singapore Ministry of Education 2022: paras. 1 and 3). Although the influence of education on attitudes is equivocal, this study includes education as a control to adjust for its effect in the analysis.

Ethnic background may also shape family-formation attitudes in Singapore (Jones, Zhang, and Chia 2012; Strijbosch 2015; Zainal 2018; Ramdas 2012). The ethnic composition of Singapore's resident population was 74% Chinese, 14% Malay, 9% Indian, and 3% other ethnicities in 2020 (Singapore Department of Statistics 2020c). Singlehood rates are higher for ethnic Chinese than for all other ethnic groups. For example, the proportion of single Chinese women aged 30 to 39 (29.9%) is higher than that of Malays (17.2%) and Indians (15.3%). Similarly, the proportion of single Chinese men aged 30 to 39 (35.4%) is higher than that of Malays (24.7%) and Indians (21.8%). These figures suggest that ethnicity may be associated with differential attitudes. Hence ethnicity is also included as a control in the analysis.

2.5 Links between the never married and their marriage desires

Based on the traits–desires–intentions model (Miller 1986; Miller and Pasta 1988), there is a three-step motivational sequence in which attitudinal traits are associated with marriage desires, which result in marriage intentions. Marriage desires reflect underlying attitudes and predispositions, whereas marriage intentions integrate these desires with plans for action and an appraisal of personal circumstances and perceived constraints (Miller and Pasta 1995). This study examines the first two steps of the model, linking individuals' attitudinal dispositions to their marriage desires. Previous studies have found that individuals who hold more traditional attitudes toward family formation are more likely to desire marriage, those who hold ambivalent or passive attitudes toward marriage are likely to have lower marriage desires, and those who are skeptical about marriage tend to reject it (Raymo, Uchikoshi, and Yoda 2021; Willoughby 2014). The study posits that family conservatives will have the highest desire to marry, followed by conflicted conservatives and family skeptics (Hypothesis 3).

To sum up, Table 1 outlines the hypotheses for this study.

Table 1:   Hypothesized groups, traits, and marriage desires

Hypothesized groups	Age/life stage	Sex	Marriage desires
Family skeptics (H1a)	‣ More likely to be older (H2a) ‣ Less likely to be in a relationship (H2b)	More women (H2d)	Lowest (H3)
Family conservatives (H1b)	–	More men (H2c)	Highest (H3)
Conflicted conservatives (H1c)	–	More women (H2d)	Middle (H3)

3. Aim and contributions

This study aims to explore and analyze the within-country and individual-level variability in attitudes to explain how different competing paradigms shape the plurality of the never married. Singapore has received little scholarly attention in the rich cross-national literature on nuptiality. Previous research on marriage in Singapore is scant and often limited to qualitative studies (Jones, Zhang, and Chia 2012; Strijbosch 2015) or examinations of aggregated marriage trends (Jones 2005, 2007; Jones and Yeung 2014). Given that Singapore's high non-marriage and late-marriage rates are characteristic of similar low-fertility countries in Asia, the country presents an important and understudied social setting to extend our understanding of heterogeneity among never-married individuals, which has yet to be adequately explored in the literature.

This study contributes to the literature in three respects. First, it extends prior theoretical and empirical work on the never married by proposing a shift in perspective toward a holistic and person-centered conceptualization that considers diversity in the population. By classifying singles into distinct subgroups, the study provides deeper insights into their sociodemographic traits and marriage desires in an increasingly diverse family and cultural milieu. Second, this study leverages the use of LCA to inductively, rather than deterministically, identify a typology of the never married. The use of a data-driven technique allows serendipitous findings, including unhypothesized subgroups, to emerge from the data. Third, this study fills a gap in the literature by being one of the few studies to examine singlehood in a relatively understudied context. Singapore presents a valuable and unique context for explaining the singlehood phenomenon because of its rising singlehood rates and declining fertility. By adding to the small body of research on archetypes of singles and their marriage desires, the present study provides a novel perspective for explaining the flight from marriage in Singapore and highlights the importance of recognizing heterogeneity among the never married.

4. Data and methods

4.1 Data

This study uses data from POPS Survey 6: Perceptions of Singles on Marriage and Having Children, collected by the Institute of Policy Studies. The survey aimed to understand the perceptions and attitudes of never-married Singaporean residents toward marriage, family, and parenthood, including perspectives on premarital cohabitation and having children outside of marriage (Yap 2013). The survey collected information on attitudes, sociodemographic characteristics, relationship status, marriage desires, and childbearing intentions. The survey was fielded over six weeks, in August, September, and October 2012. A total of 2,000 never-married Singapore citizens and permanent residents aged between 21 and 39 years (i.e., born between 1973 and 1991) were interviewed. The interviews were conducted using a computer-assisted telephone interviewing platform. Respondents were randomly chosen using the SPSS random number generator, which generated random landline and mobile phone numbers. The response rate for the survey was 30%, and sample weights were provided to improve survey estimates and representativeness. (See Table A-1 in the appendix for a comparison of population parameters and unweighted sample distribution.) The data were weighted based on three key variables – age, sex, and ethnicity – to ensure that the sample distribution reflected the distribution of individuals who never married among the Singaporean adult resident population. All results presented in this study are weighted.

Twenty respondents (1%) were excluded from the analysis because they had missing values on the covariates. (Seven had a missing value on educational attainment, 12 had a missing value on relationship status, and one had missing values on both.) The final analytic sample included 1,980 never-married Singaporean residents. Detailed summary statistics for the sample can be found in Table A-2 in the appendix.

4.2 Measures

To classify never-married individuals into subgroups, 26 attitudinal indicators were used to identify the hypothesized groups of family skeptics (H1a), family conservatives (H1b), and conflicted conservatives (H1c). Next, using the identified subgroups as the dependent variable, the effects of age (H2a), relationship status (H2b), and sex (H2c and H2d) were examined, controlling for educational attainment and ethnicity. Lastly, to understand how group membership predicts marriage desires, the identified subgroups were used as the independent variable and marriage desires were used as the dependent variable.

4.2.1 Attitudinal indicators

A total of 26 attitudinal indicators were used to derive distinct subgroups of never-married individuals. These indicators represented five dimensions related to family formation: attitudes about marriage and family, cohabitation and premarital sex, parenthood, work–family roles, and gender roles. These attitudinal indicators were measured on a binary scale (0 = disagree; 1 = agree). Nonspecific responses, such as "Don't know," were considered missing values.

The first dimension, attitudes toward marriage and family, was measured by four indicators. Of these indicators, two represented positive attitudes toward marriage (e.g., "Marriage provides a spouse with emotional stability"). Two indicators represented negative attitudes toward marriage (e.g., "Marriage incurs unnecessary responsibilities"). The second dimension, attitudes toward cohabitation and premarital sex, comprised four indicators (e.g., "Sex is only acceptable within a marriage"). The third dimension, attitudes toward parenthood, consisted of four indicators. Three indicators represented positive attitudes toward having children (e.g., "Children provide the support needed in old age"). One indicator represented negative attitudes toward having children (e.g., "Children are an unnecessary burden"). The fourth dimension, attitudes toward work–family roles, included four indicators (e.g., "Marriage will hinder education and career pursuits"). The last dimension, on gender roles, comprised ten indicators. Half of these indicators represented traditional gender role attitudes (e.g., "A preschool child is likely

to suffer if their mother works"), and the other half represented less traditional gender role attitudes (e.g., "A working mother can establish just as warm and secure a relationship with her children as a housewife"). Negative items (e.g., "Marriage incurs unnecessary responsibilities") were reverse coded. This means that a higher percentage of agreement represents more positive attitudes about marriage and family, less accepting attitudes about cohabitation and premarital sex, more positive attitudes about having children, more positive views about the compatibility of work and family roles, and more inegalitarian attitudes about gender roles. A detailed list of indicators is provided in Table 2.

Table 2:   Description of attitudinal dimensions and indicators

Dimension	Indicator	N
Marriage and family	Life is incomplete without marriage.	1,929
	Marital companionship is replaceable by meaningful friendship.	1,907
	Marriage incurs unnecessary responsibilities.	1,933
	Marriage provides a spouse with emotional stability.	1,908
Cohabitation and premarital sex	Sex is only acceptable within a marriage.	1,913
	One can only have children if married.	1,939
	If a man and a woman want to live together before marriage, do you feel this is acceptable or unacceptable?	1,856
	How about an unmarried couple having children? Do you think this is acceptable or unacceptable?	1,466
Parenthood	Life is incomplete without children.	1,924
	Having children is important for an adult to live a fulfilled life.	1,928
	Children are an unnecessary burden.	1,941
	Children provide the support needed in old age.	1,899
Work–family roles	Marriage will hinder education and career pursuits.	1,910
	Marriage puts an end to independence and freedom.	1,917
	Children hinder education and career pursuits.	1,921
	Children put an end to independence and freedom.	1,929
Gender roles	Being a housewife is just as fulfilling as working for pay.	1,810
	A preschool child is likely to suffer if their mother works.	1,870
	A job is alright, but what most women really want is a home and children.	1,766
	Children often suffer because their fathers concentrate too much on their work.	1,888
	If parents divorce, it is better for the child to stay with the mother than with the father.	1,316
	If a woman earns more than her husband, it is not good for the relationship.	1,837
	Women should be able to decide how to spend the money they earn without having to ask their husband's permission.	1,899
	For a man, looking after the home or family is just as fulfilling as working for pay.	1,827
	A working mother can establish just as warm and secure a relationship with her children as a housewife.	1,863
	Having a job is the best way for a woman to be independent.	1,909

Source: Author's calculations based on the Perceptions of Singles on Marriage and Having Children survey, 2012.
Note: The raw number of responses for each indicator is reported in the table.

4.2.2 Sociodemographic factors

Five sociodemographic factors were included in the analysis: age, gender, relationship status, educational attainment, and ethnicity. Age was a continuous variable ranging from 21 to 39 years. Sex was binary coded as 0 = man and 1 = woman. Relationship status was recorded as a categorical variable: (1) not dating (reference group), (2) dating, (3) in a relationship, and (4) living with a partner. The original education variable comprised five categories: primary school leaving examination and below; general certification of education, normal or ordinary level; general certification of education, advanced level; polytechnic and other diplomas; and university education. A binary variable was created for respondents with a university education (0 = no; 1 = yes). Ethnicity was coded as a categorical variable: (1) Chinese (reference group), (2) Malay, (3) Indian, and (4) other.

4.2.3 Marriage desires

The desire to marry was measured using a three-category nominal item ("How desirable is marriage to you?"). The response categories were "Definitely want to get married," "Definitely don't want to get married," and "Not sure." To differentiate between individuals with a clear desire and those without, the desire to marry was recoded into two categories (0 = no/not sure; 1 = yes). Additional analyses were conducted to compare the use of two- and three-response categories and yielded equivalent results.

4.3 Analytic strategy

This study utilized LCA to identify unobserved latent subgroups of never-married individuals. LCA uses a person-centered approach instead of a variable-centered approach to classify individuals into subgroups based on their response patterns across a set of observed indicators. The goal is a distinct and parsimonious classification of individuals into latent subgroups by maximizing heterogeneity between and homogeneity within subgroups. LCA assigns never-married individuals to their most likely predicted group based on their conditional responses to 26 attitudinal indicators (Celeux and Soromenho 1996).

To identify the optimal number of latent subgroups, a series of LCA models from two to six groups were estimated. A variety of model fit criteria were evaluated across models to determine the most appropriate model. These criteria included entropy, model convergence, the Akaike information criterion (AIC), the Bayesian information criterion (BIC), the Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR-LRT), the bootstrap

likelihood ratio test (BLRT), and the interpretability of groups to compare the relative fit of the models. Entropy, ranging from zero to one, indicates a clear delineation of subgroups with values approaching one (Celeux and Soromenho 1996). Information criteria are fit indices that penalize model complexity, whereby a lower value identifies the preferred model with fewer parameters and a larger sample size (Schwartz 1978). The adjusted likelihood ratio tests compare the goodness of fit between two statistical models based on relative improvements in the likelihood value (Lo, Mendell, and Rubin 2001). This study focused primarily on the information criteria and substantive interpretation of subgroups to select a parsimonious model that best describes the heterogeneity in the population (Nylund, Asparouhov, and Muthén 2007).

To summarize key patterns that emerged from the large set of attitudinal indicators, I calculated an average probability based on all conditional item responses within each of the five attitudinal dimensions. An above-average probability was used to differentiate the various levels of attitudes into positive ($\geq 60\%$) versus negative views toward marriage and family, unaccepting ($\geq 60\%$) versus accepting views toward cohabitation and premarital sex, positive ($\geq 60\%$) versus negative views toward parenthood, views that work–family roles were compatible ($\geq 60\%$) versus incompatible, and inegalitarian ($\geq 40\%$) versus egalitarian views on gender roles.[2] The results are summarized in Table 2 to facilitate interpretation.

I used multinomial logistic regression to examine whether the probability of group membership varied by sociodemographic characteristics, including age, relationship status, and sex. Subsequently, the never-married subgroups were used to predict marriage desires as a distal outcome (dependent variable). All analyses were modeled in a one-step, complete case LCA to integrate the latent class model with the regression model, enabling all equations to be estimated at the same time. Given the complex interrelationships among attitudinal indicators, sociodemographic characteristics, and marriage desires, the one-step approach provides a better estimate of the LCA model by simultaneously considering their associations with one another, thereby reducing standard errors of the estimates and improving the identification and separation of subgroups (Bakk, Tekle, and Vermunt 2013; Kamata et al. 2018). By jointly estimating the LCA model with attitudinal indicators and auxiliary variables (i.e., predictors and distal outcome), one can further scrutinize the latent subgroups identified by considering if and how these subgroups are associated with individual characteristics and the extent to which group membership is associated with marriage desires.

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[2] The average conditional probabilities for attitudes toward marriage and family, cohabitation and premarital sex, parenthood, work–family roles, and gender roles were around 50%–60%. Because the items for gender roles were less discriminating (e.g., most respondents agreed that "women should be able to decide on how to spend the money they earn without having to ask their husband's permission"), the average conditional probability was around 40% for attitudes about gender roles.

LCA was conducted in M*plus* 8.0 using full information maximum likelihood (FIML) with robust standard errors to handle missing data on attitudinal indicators (Muthén and Muthén 2017). By default, M*plus* performs listwise deletion for missing covariates (n = 20) but implements FIML to handle missing data on the observed attitudinal indicators. FIML uses all available observations for each case to compute the log-likelihood function for parameter and standard error estimates, which improves the precision of estimation and increases statistical power (Enders 2010). Simulation studies have consistently shown that FIML and multiple imputation are equivalent methods that outperform listwise deletion and other substitution methods (Cheung 2015; Enders and Bandalos 2011). Details on the missing data patterns of the indicators are available in Table A-3. Descriptive statistics and plots were generated using Stata/SE 15.1 (from StataCorp, College Station, Texas).

5. Results

The results are presented as follows: (1) never-married typology based on response patterns across five dimensions of family-related attitudes, (2) description of the sociodemographic characteristics of each never-married subgroup, (3) findings from regression analysis to explain the association between individual characteristics and group membership, and (4) differences in marriage desires across never-married subgroups.

5.1 Typology of the never married

LCA models with increasing subgroups were estimated until the fit indices indicated no further model improvement. The models were also assessed to determine which model provides the most heuristic value in helping us understand the never-married population. Overall, the four-group model appeared to be the best-fitting model given its highest entropy (0.79) value, nonsignificant BLRT and VLMR-LRT results in sequentially nested models, and prominent elbow points in the AIC and BIC plots (see Figure A-1 in the appendix). The elbow plot suggests that the model fit reached a saturation point of "diminishing returns" after four groups – a point at which increasing the number of groups does not further improve model performance (Nylund-Gibson and Choi 2018). While the five- and six-group models showed slightly lower BIC values, the interpretation remains identical. Specifically, the five-group solution differed from the four-group solution by splitting one group based on a slightly higher acceptance of cohabitation. The six-group solution further splits another group based on a slightly

higher acceptance of premarital sex. Therefore the final model, with four subgroups, was selected for parsimony, goodness of fit, and interpretability.

Table 3 provides a summary of the four never-married subgroups. Further details on the conditional probabilities of the typology and subgroup associations with each attitudinal indicator are in Table A-4. The categorization of various dimensions of attitudes in Table 3 is based on group-specific item-response probabilities in Table A-4.

Table 3:   Summary of family-formation dimensions by never-married subgroups

Dimension	Family conservatives	Conflicted conservatives	Family progressives	Family skeptics
Marriage and family	Positive	Positive	Negative	Negative
Cohabitation and premarital sex	Unaccepting	Unaccepting	Accepting	Accepting
Parenthood	Positive	Positive	Negative	Negative
Work–family roles	Compatible	Incompatible	Compatible	Incompatible
Gender roles	Inegalitarian	Inegalitarian	Egalitarian	Egalitarian
Group size (N = 1,980)	730	479	431	340
Group percentage	37%	24%	22%	17%

Never-married individuals in the largest group (37% of the sample) correspond to the hypothesized group of family conservatives (H1b). As predicted, these individuals held more positive attitudes toward marriage and parenthood. In general, they were less likely to be supportive of cohabitating relationships and having sex before entering marriage. Their attitudes on having children were positive, and they considered work and family roles congruent. Their attitudes about gender roles within the family and in the workplace were relatively traditional, and they generally believed that women and men should adjust their careers for family life.

The second largest group of never-married individuals (24% of the sample) matched the hypothesized group of conflicted conservatives (H1c). Although they held positive attitudes toward marriage and parenthood, they perceived high levels of incompatibility between work demands and family life. The multiple roles of being a marriage partner, being a parent, and being in the workforce were considered conflicting with one another. They were less accepting of cohabitation and premarital sex. They held relatively traditional gender role attitudes but believed that the best way for a woman to be independent was to have a job. At the same time, this group showed the highest level of agreement (39%) with the statement "If a woman earns more than her husband, it is not good for the relationship."

The third group (22% of the sample) was not hypothesized and was labeled the family progressives group. They had less favorable views about marriage and parenthood and did not feel that life would be incomplete without marriage or children. They were generally accepting of cohabitation, premarital sex, and births outside of marriage. This

group did not perceive the multiple roles and shared responsibilities in the work and family domains to be incompatible. They were also likely to support more egalitarian gender roles.

The smallest group (17% of the sample) closely resembled the hypothesized group of family skeptics (H1a) based on the SDT theory (Lesthaeghe 2010; Zaidi and Morgan 2017). This group held less traditional attitudes about marriage, parenthood, cohabitation, premarital sex, and nonmarital childbearing. Their life orientations did not necessarily include marriage, as they did not believe their lives would be incomplete without marriage or children. Instead they viewed marriage and parenthood as incompatible with their individual pursuits. This group saw marriage as a personal choice rather than an obligatory part of life.

Overall, the never-married subgroups are relatively consistent with the predictions of existing theoretical frameworks and empirical evidence. All three hypothesized groups (family skeptics [H1a], family conservatives [H1b], and conflicted conservatives [H1c]) were identified, with the inclusion of another group (family progressives), which was not hypothesized.

5.2 Descriptive statistics for the four subgroups

Table 4 provides a description of the subgroups by five sociodemographic characteristics: age, sex, relationship status, education, and ethnicity. Although the descriptive findings highlight broad associations between these characteristics and each latent subgroup, they do not suggest that the groups can be reduced to a few individual characteristics. Instead, the different latent subgroups encapsulate salient differences between individuals that these sociodemographic characteristics may not.

Table 4: **Description of sociodemographic traits by never-married subgroup**

Variable	Family conservatives	Conflicted conservatives	Family progressives	Family skeptics
Mean age	26.15	26.81	28.33	29.00
(SD)	(0.19)	(0.25)	(0.32)	(0.36)
Sex				
Male	0.62	0.59	0.52	0.37
Female	0.38	0.42	0.48	0.63
Relationship status				
Not dating	0.46	0.54	0.60	0.64
Dating	0.14	0.11	0.10	0.11
In a relationship	0.37	0.34	0.29	0.20
Living with a partner	0.02	0.02	0.02	0.05
University education				
No	0.61	0.60	0.44	0.41
Yes	0.39	0.40	0.56	0.59
Ethnicity				
Chinese	0.69	0.76	0.85	0.91
Malay	0.19	0.15	0.05	0.05
Indian	0.10	0.07	0.05	0.04
Other	0.02	0.03	0.05	0.01
Group size (N = 1,980)	730	479	431	340
Group percentage	37%	24%	22%	17%

Source: Author's calculations based on the Perceptions of Singles on Marriage and Having Children survey, 2012.
Note: The mean and standard deviation for the continuous variable and proportions for the categorical variables are presented.

On average, family conservatives and conflicted conservatives were relatively younger compared to family progressives and family skeptics. The mean ages for family conservatives and conflicted conservatives were around 26 years, compared to family progressives and family skeptics, with mean ages of 28 and 29 years, respectively. In comparison, the majority of family conservatives were men, and the majority of family skeptics were women. The proportion of men was the highest for family conservatives (62%), followed by conflicted conservatives (59%), family progressives (52%), and family skeptics (37%). A large majority of individuals (64%) who were not dating belonged to the group of family skeptics, compared to family progressives (60%), conflicted conservatives (54%), and family conservatives (46%).

In general, family progressives and family skeptics had higher educational attainment than family conservatives and conflicted conservatives. Compared to the ethnic Chinese, ethnic Malays and Indians were more likely to be in the family conservatives and conflicted conservatives groups than in the family progressives and family skeptics groups. A relatively large proportion of individuals of other ethnicities belonged to the family progressives subgroup.

5.3 Regression analysis of never-married subgroups

Table 5 presents the multinomial logistic regression results predicting group membership by age, sex, and relationship status, controlling for education and ethnicity. Older individuals were more likely than younger individuals to be family progressives (RRR = 1.08; 95% CI: 1.03–1.14) and family skeptics (RRR = 1.12; 95% CI: 1.05–1.19) than family conservatives. Women were more likely than men to be family skeptics (RRR = 2.73; 95% CI: 1.79–4.15) than family conservatives. Those in a relationship were less likely to be family progressives (RRR = 0.57; 95% CI: 0.38–0.85) and family skeptics (RRR = 0.36; 95% CI: 0.24–0.54) than family conservatives.

Table 5: **Multinomial logistic regression of sociodemographic traits on never-married subgroups**

| Variable	Conflicted conservatives, n = 479		Family progressives, n = 431		Family skeptics, n = 340	
	RRR	*p*-value	RRR	*p*-value	RRR	*p*-value
Age	1.03 [0.99–1.08]	0.208	1.08 [1.03–1.14]	0.016	1.12 [1.05–1.19]	0.005
Sex (ref: men)						
Women	1.22 [0.89–1.68]	0.354	1.44 [0.97–2.14]	0.204	2.73 [1.79–4.15]	0.013
Relationship status (ref: not dating)						
Dating	0.71 [0.47–1.08]	0.108	0.65 [0.41–1.04]	0.061	0.63 [0.37–1.06]	0.063
In a relationship	0.79 [0.56–1.11]	0.198	0.57 [0.38–0.85]	0.002	0.36 [0.24–0.54]	<0.001
Living together with a partner	0.44 [0.14–1.36]	0.060	0.42 [0.13–1.35]	0.054	0.81 [0.35–1.87]	0.639
University education (ref: no)						
Yes	0.84 [0.61–1.16]	0.335	1.46 [0.93–2.27]	0.246	1.63 [1.09–2.45]	0.115
Ethnicity (ref: Chinese)						
Malay	0.69 [0.42–1.13]	0.131	0.27 [0.17–0.44]	<0.001	0.30 [0.19–0.50]	<0.001
Indian	0.63 [0.38–1.03]	0.048	0.49 [0.29–0.81]	0.001	0.39 [0.24–0.63]	<0.001
Other	0.99 [0.44–2.23]	0.982	1.40 [0.61–3.23]	0.575	0.11 [0.01–0.97]	<0.001

Note: N = 1,980. The group of family conservatives is the reference category (n = 730). Bracketed values indicate the 95% confidence interval. RRR = relative risk ratio.

To further examine the association between group membership and relationship status, Figure 1 shows the relative probabilities of being in different never-married subgroups by respondent's relationship status. Compared to those who were not dating,

those who were dating and those who were in a relationship had a 10% and 13% higher probability of being family conservatives, respectively. Those in a relationship had a 9% lower probability of being family skeptics than those not dating.
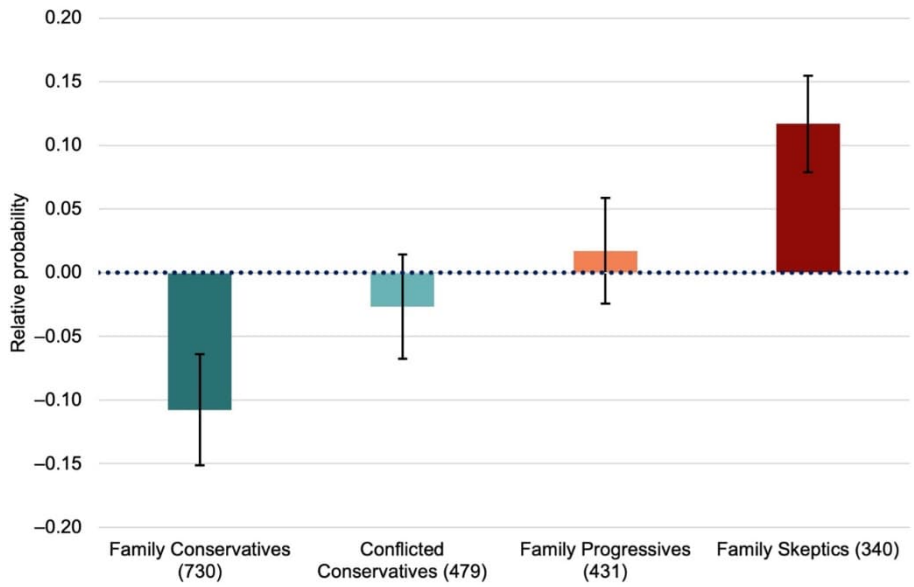
Figure 1:   Average marginal effect of group membership by relationship status
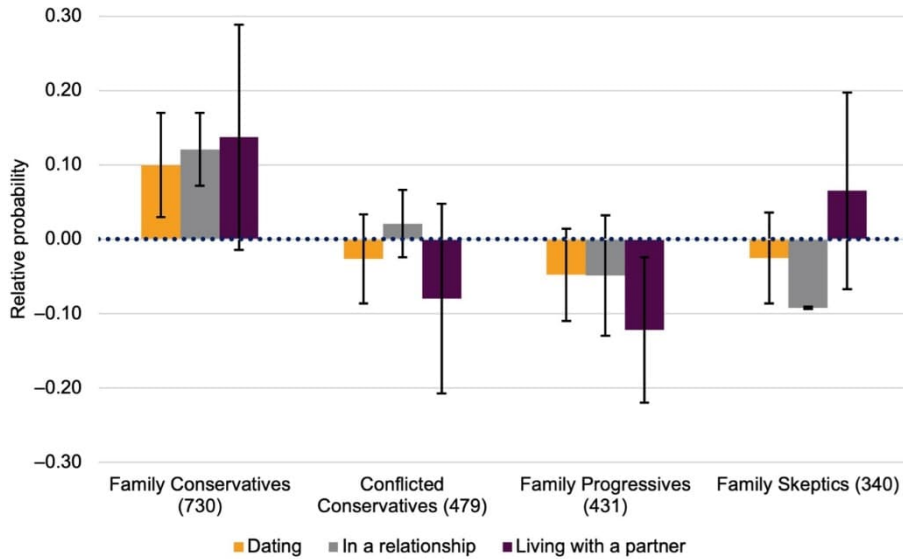
Note: The dotted reference line refers to those who were not dating. The number of respondents in each group is in parentheses.

To explain the association between group membership and sex, Figure 2 shows the relative probabilities of being in different never-married subgroups by sex. Compared to men, women had a 12% higher probability of being family skeptics and an 11% lower probability of being family conservatives.

Figure 2:   **Average marginal effect of group membership by sex**

5.4 Marriage desires

To examine the variability of marriage desires by never-married subgroup, the effect of group membership on marriage desires was estimated. Figure 3 shows each subgroup's conditional probabilities of marriage desires, controlling for the sociodemographic variables in Table 4. There was a significant association between the never-married subgroups and marriage desires. Specifically, family conservatives had the highest desire to marry (89%), followed by conflicted conservatives (74%), family progressives (57%), and family skeptics (36%). The emergence of a distinct gradient in marriage desires across the never-married subgroups implies that subgroup variations influence the desire to marry. Family conservatives and conflicted conservatives who held more traditional attitudes about marriage and parenthood were more likely to want to get married, regardless of the perceived conflict between work and family. On the other hand, family progressives and family skeptics who held more progressive attitudes about marriage and parenthood were less likely to want to get married, especially if they viewed marriage and parenthood as incongruent with their personal aspirations.

Figure 3:   Marriage desires by never-married subgroup (N = 1,980)
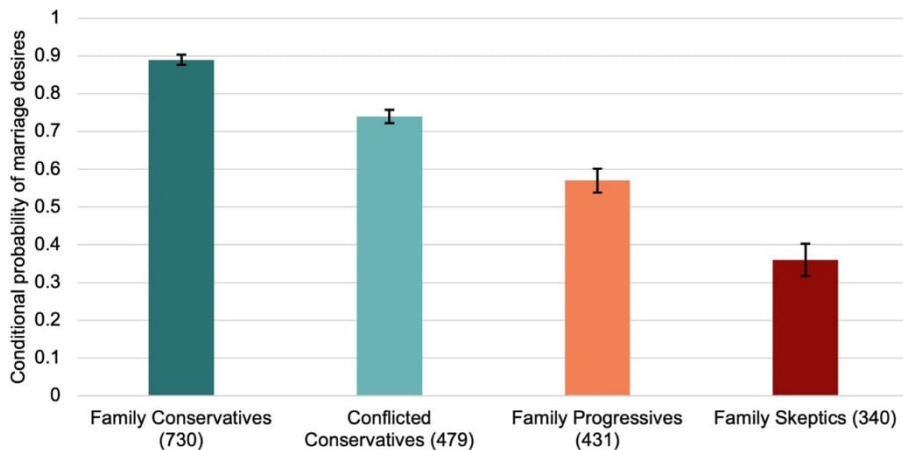
Note: The number of respondents in each group is in parentheses.

5.5 Sensitivity analysis

To check for the robustness of the LCA models, I performed complete case parameter estimation to investigate the effect of non-response from incomplete data. The analysis of missing data comparing the FIML and complete case models yielded comparable results and did not change the substantive interpretation of subgroups. Sex-stratified models were estimated to examine whether women and men were best represented by the same number of subgroups. Although subgroup prevalence varied by sex, the general interpretation and number of subgroups were identical. Age-stratified models – for individuals aged below 25, 25 to 29, and 30 or above – were estimated to investigate the age effects among singles at different life stages. The resulting subgroup formation for these models was comparable to the final model. A series of two-way interactions was tested to examine the effects of sex by age, education level by age, and education level by sex. The interaction terms between age and sex, age and education, and sex and education were not significant and were not included in the final model. Further alternative models were estimated by including other sociodemographic characteristics, including occupation, monthly income, and religion. Including these variables did not change the results of the LCA models. The alternative models produced similar results and interpretations of subgroups. The final model was selected on the basis of parsimony.

6. Discussion and conclusion

This study clarifies the variation of never-married subgroups and how this variation is related to individual sociodemographic traits and marriage desires. Rather than classifying never-married individuals to broad monolithic groups based on conventional analyses of attitudes, this study proposes that it is crucial to consider attitudinal response patterns observed in fluid combinations. LCA offers several advantages over treating different attitudinal dimensions as independent variables or interacting with these attitudinal dimensions. It focuses on the subgroups identified instead of considering each observed indicator separately or all possible combinations of indicators (McCutcheon 1987). In this study, there are 2^{28} combinations using the 28 attitudinal indicators as independent variables or 2^5 combinations after reducing the indicators into their five attitudinal dimensions, which may be challenging to model. By accounting for the complex interrelations between attitudinal indicators, LCA provides an efficient and parsimonious approach for identifying never-married subgroups within a heterogeneous population. The findings of this study corroborate existing literature on the importance of investigating diversity among the never married (Raymo et al. 2021) and provide a nuanced appreciation of the relationship between subgroups and their marriage desires. Specifically, four distinct never-married subgroups were identified. Three of the four groups – family conservatives (37%), conflicted conservatives (24%), and family skeptics (17%) – were consistent with theories relating to the SDT, traditional familism, and the tension between work and family in a relatively gender-inegalitarian society. One group, the family progressives (22%), was not predicted.

The first hypothesized group, family skeptics (H1a), matched aspects of the SDT theory as they resisted traditional marriage norms and were more accepting of cohabitation and nonmarital sexual relations. Marriage and children were seen as a hindrance to individual pursuits, ending independence and freedom. The SDT theory, however, was not designed to account for within-country variation (Zaidi and Morgan 2017). The group of family progressives that fell outside of predictions appears to be a variant of the SDT. They held similar attitudes to the family skeptics regarding marriage, cohabitation, and nonmarital births but differed in their emphasis on individualism and the value of independence and freedom. The family progressives did not place individual pursuits before family life. The differences between the two groups may appear slight. Still, they are crucial all the same, as they reveal potential shortfalls of the SDT theory in explaining the declining trends in marriage and fertility in Asia (Raymo et al. 2015). This raises an important point about the often assumed unilinear developmental pathway of family change, where the realities of past and present Western societies are thought to depict the existing and forthcoming realities of the non-Western world (Thornton 2013). The degree of heterogeneity found in this study reflects how the process of cultural

change and adaption involves a complex interplay between modernization (or Westernization) and reconciliation with traditional (or Asian) values. This way of thinking challenges the notion that societies follow a standard and uniform trajectory in the development of 'modern' families.

In line with empirical evidence on the prevalence of traditional familism in Asian societies provided by Cheung and Kim (2018), and in line with H1b, the study found evidence of a more traditional group of family conservatives who conformed to the conventional expectations of familism. They viewed marriage as an institution that was more significant than themselves and were willing to sacrifice their personal aspirations for the sake of the family. This group had the strongest preferences for marriage. In contrast to the family skeptics, the family conservatives offer evidence indicating that a relatively large proportion of singles still have a general desire to marry.

The third hypothesized group, conflicted conservatives (H1c), demonstrated dissonance associated with combining multiple roles, such as work and family. Notwithstanding their traditional positive views toward marriage and parenthood, the conflicted conservatives found marriage and children a hindrance. This finding concurs with Jones, Zhang, and Chia (2012), who found that Singaporeans have the desire to marry but that rising work demands hinder opportunities to meet potential marital partners. For instance, under Singapore's Employment Act, a full-time employee works an average of 44 hours each week and may work up to 72 overtime hours in a month, which could total up to about 62 hours a week with just one rest day per week (Singapore Ministry of Manpower 2020). Young employees who are just beginning their careers may face long working hours and work requirements that make it challenging to find time to date and eventually marry. Conflicted conservatives might find themselves in a predicament, where they have to choose between work and marriage. They might remain involuntarily single if they cannot find a suitable partner due to work and time constraints.

The findings show unique compositional differences among the never-married subgroups. Consistent with the life course literature and H2a, older individuals were more likely to be family skeptics than younger individuals. As Gray, Evans, and Reimondos (2013) suggest, older individuals may experience sociostructural or biological constraints, such as the lack of a suitable partner, bad relationship experiences, or health and financial problems, when pursuing a particular family-formation ideal. If they perceive that their goal is unlikely to be achieved, individuals may adjust their attitudes and aspirations to devalue that goal and pursue alternative personal goals, resulting in more skeptical attitudes toward family formation (Brandtstädter 2009).

In addition, the findings support the hypothesis that individuals in a relationship are less likely to be family skeptics (H2b). Not only are they less skeptical, but they are also more likely to be family conservatives. Previous evidence suggests that individuals may become more traditional in their family-formation attitudes after experiencing a

significant life event, such as the transition to marriage or parenthood (Kim and Cheung 2015). While being in a relationship may be less of a significant event than marriage or parenthood, individuals may have more positive views toward family formation as a reflection of their current life circumstances (Boerner and Jopp 2007). More conservative individuals may also tend to seek out relationships. In this sense, attitudes and life events are potentially mutually reinforcing. While an individual's attitude may shape their desires and subsequent behavior, their life stage may also influence their attitudes.

Regarding sex differences, the findings support H2c, which predicts that men are more likely to be family conservatives than women. The results provide partial support for H2d, as women are more likely to be family skeptics than men, but no significant differences between men and women were observed for conflicted conservatives. These findings are generally in line with research in the West showing that women are more likely to view marriage and parenthood as restrictive (Thornton 1989) and that women are less likely to believe that children are the primary purpose of marriage and that people without children lead empty lives (Thornton and Young-Demarco 2001). Women tend to be less traditional concerning family and gender issues (Bolzendahl and Myers 2004). In the Singaporean context, scholars such as Lim (2019) and Teo (2013) have argued that the notion of conventional family affirms and perpetuates patriarchal power. Thus men, privileged by the dominant ideology of the family, are more likely to support the ideals of the family conservatives. The lack of sex differences for the group of conflicted conservatives suggests that men and women may perceive work and family conflict in their own ways (Powell and Greenhaus 2010). Considering the hectic work culture in Singapore, work and family integration may be just as challenging for both men and women (Jones, Hill, and Miller 2020).

In line with the traits–desires–intentions model (Miller 1986; Miller and Pasta 1988), the never-married subgroups identified based on their attitudinal dispositions are related to marriage desires. The findings are consistent with H3, which stipulates that family conservatives, who hold the most traditional and favorable attitudes toward family formation, are likely to have the highest marriage desires; family skeptics, who hold less traditional and unfavorable attitudes toward family formation, are likely to have the lowest marriage desires; and conflicted conservatives, who perceive potential incompatibilities between work and family, are likely to have a middle level of marriage desires. The link between attitudes and desires is crucial as it relates to subsequent behavior and outcome (Ajzen 1985, 1991; Miller and Pasta 1995). Although family conservatives make up the largest group of singles, increasing work–family conflict (Jones and Yeung 2014), changing norms around family and gender (McDonald 2000), and increasing situational constraints that are inconducive to marriage and children (Raymo et al. 2015) may increase the prevalence of other never-married subgroups and lead to further postponement or even rejection of family formation.

This study has some limitations but presents several opportunities for further research. The unique cross-sectional data used in this study provide valuable insights into the never-married population at a particular time point but are limited in explaining transition patterns and change processes. As the analysis is conducted on a sample of men and women aged 21 to 39, older individuals who are past the normative marriageable age and are never married may hold attitudes that differ from younger individuals who are still considered to be of marriageable age. While the findings suggest that individuals tend to be more skeptical about marriage and children as they age, qualitative studies or longitudinal studies following young adults until the end of their reproductive years may be better suited to further investigate changes over the life course. Nevertheless, using the only currently available data in Singapore, the age-stratified models performed in the sensitivity analysis showed that the typology of never-married individuals remains robust and consistent across age groups, supporting the overall heterogeneous grouping of the never-married population.

Despite the limitations, a vital contribution of this study is the integration of a wide array of interrelated family attitudes into a person-centered and holistic framework. The development of an empirically grounded typology highlights the importance of recognizing subgroup variations and brings issues related to oversimplified frameworks of (non-)marriage to the fore. As the world becomes increasingly globalized, diverse trends in cultural differentiation, cultural convergence, and cultural hybridization may occur and lead to greater diversity in populations (Pieterse 1996). This study proposes that a more integrative approach that views individuals as their experience in the world can better inform existing ways of thinking about family change and its implications for society (Bugental 1964). As the first study to use LCA as a person-centered approach to understanding variations in the never-married population, this study demonstrates a clear gradient in marriage desires across never-married subgroups. This is consequential considering that the desire to marry motivates marriage outcomes. In an age-skewed marriage market with a rising proportion of older singles, the group of family skeptics, rather than the family conservatives, may prevail as the most dominant group in the coming decades. This has implications for societies with declining marriage and fertility rates, as policies encouraging childbirth that do not also impact marriage trends are unlikely to increase long-term fertility.

Lastly, existing research on singlehood has focused mainly on trends toward later and fewer marriages, with little attention paid to variations and compositional differences among the never married. The never-married typology uncovered in this study provides a basis for comparison with other populations of interest to examine whether the compositional patterns are shared internationally. The relationship between never-married subgroups and marriage aspirations could also be tested in Asia and farther afield. Comparative research with other samples may yield better refinement of the

typology and theory. Those who research singles' attitudes toward family formation could consider using a person-centered approach to capture transitions over the life course. Ideally, the research design would include not only the life course of voluntary singles but also that of involuntary singles to render a more comprehensive picture of how singles navigate the increasing complexities of work, family, and life in contemporary society.

7. Acknowledgments

References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In: Kuhl, J. and Beckman, J. (eds.). *Action control: From cognition to behavior*. Berlin: Springer: 11–39. doi:10.1007/978-3-642-69746-3_2.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50(2): 179–211. doi:10.1016/0749-5978(91)90020-T.

Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology* 52(1): 27–58. doi:10.1146/annurev.psych.52.1.27.

Ajzen, I. and Klobas, J. (2013). Fertility intentions: An approach based on the theory of planned behavior. *Demographic Research* 29(8): 203–232. doi:10.4054/DemRes.2013.29.8.

Arocha, J.F. (2021). Scientific realism and the issue of variability in behavior. *Theory and Psychology* 31(3): 375–398. doi:10.1177/0959354320935972.

Bakk, Z., Tekle, F.B., and Vermunt, J.K. (2013). Estimating the association between latent class membership and external variables using bias-adjusted three-step approaches. *Sociological Methodology* 43(1): 272–311. doi:10.1177/0081175012 470644.

Balbo, N., Billari, F.C., and Mills, M. (2013). Fertility in advanced societies: A review of research. *European Journal of Population* 29(1): 1–38. doi:10.1007/s10680-012-9277-y.

Balter, M. (2006). The baby deficit. *Science (American Association for the Advancement of Science)* 312(5782): 1894. doi:10.1126/science.312.5782.1894.

Barber, J.S. (2001). Ideational influences on the transition to parenthood: Attitudes toward childbearing and competing alternatives. *Social Psychology Quarterly* 64(2): 101–127. doi:10.2307/3090128.

Barth, A. and Trübner, M. (2018). Structural stability, quantitative change: A latent class analysis approach towards gender role attitudes in Germany. *Social Science Research* 72: 183–193. doi:10.1016/j.ssresearch.2018.02.008.

Bergman, L.R. and Magnusson, D. (1997). A person-oriented approach in research on developmental psychopathology. *Development and Psychopathology* 9(2): 291–319. doi:10.1017/S095457949700206X.

Boehnke, M. (2011). Gender role attitudes around the globe: Egalitarian vs. traditional views. *Asian Journal of Social Science* 39(1): 57–74. doi:10.1163/15685311 1X554438.

Boerner, K. and Jopp, D. (2007) Improvement/maintenance and reorientation as central features of coping with major life change and loss: Contributions of three life-span theories. *Human Development* 50(4): 171–195. doi:10.1159/000103358.

Boling, P. (2008). Demography, culture, and policy: Understanding Japan's low fertility. *Population and Development Review* 34(2): 307–326. doi:10.1111/j.1728-4457.2008.00221.x.

Bolzendahl, C.I. and Myers, D.J. (2004). Feminist attitudes and support for gender equality: Opinion change in women and men, 1974–1998. *Social Forces* 83(2): 759–789. doi:10.1353/sof.2005.0005.

Brandtstädter, J. (2009). Goal pursuit and goal adjustment: Self-regulation and intentional self-development in changing developmental contexts. *Advances in Life Course Research* 14(1–2): 52–62. doi:10.1016/j.alcr.2009.03.002.

Brinton, M.C. and Lee, D. (2016). Gender-role ideology, labor market institutions, and post-industrial fertility. *Population and Development Review* 42(3): 405–433. doi:10.1111/padr.161.

Bugental, J.F.T. (1964). The third force in psychology. *The Journal of Humanistic Psychology* 4(1): 19–26. doi:10.1177/002216786400400102.

Celeux, G. and Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification* 13(2): 195–212. doi:10.1007/BF01246098.

Chan, J.S. (2000). The status of women in a patriarchal state: The case of Singapore. In Edwards, L. and Roces, M. (eds.). *Women in Asia: Tradition, modernity, and globalisation.* Ann Arbor: University of Michigan Press: 39–55. doi:10.4324/9781003118411-3.

Chen, M., Gietel-Basten, S., and Yip, P.S.F. (2020). Targeting and mistargeting of family policies in high-income Pacific Asian societies: A review of financial incentives. *Population Research and Policy Review* 39(3): 389–413. doi:10.1007/s11113-019-09539-w.

Cheung, M.W.L. (2015). Meta-analysis: A structural equation modeling approach. New York: John Wiley and Sons. doi:10.1002/9781118957813.

Cheung, A.K.-L. and Kim, E.H.-W. (2018). Domestic labor, attitudes, and women's marital satisfaction: A longitudinal study in Korea. *Journal of Family Issues* 39(16): 3931–3955. doi:10.1177/0192513X18800813.

Choe, M.K., Bumpass, L.L., Tsuya, N.O., and Rindfuss, R.R. (2014). Nontraditional family-related attitudes in Japan: Macro and micro determinants. *Population and Development Review* 40(2): 241–271. doi:10.1111/j.1728-4457.2014.00672.x.

Collins, L.M. and Lanza, S.T. (2013). *Latent class and latent transition analysis: With applications in the social, behavioral, and health sciences.* Hoboken, NJ: John Wiley.

Cooke, R. and Sheeran, P. (2004). Moderation of cognition-intention and cognition-behaviour relations: A meta-analysis of properties of variables from the theory of planned behaviour. *British Journal of Social Psychology* 43(2): 159–186. doi:10.1348/0144666041501688.

Davis, S.N. and Greenstein, T.N. (2009). Gender ideology: Components, predictors, and consequences. *Annual Review of Sociology* 35(1): 87–105. doi:10.1146/annurev-soc-070308-115920.

Enders, C.K. (2010). *Applied missing data analysis.* New York: Guilford Press.

Enders, C.K. and Bandalos, D.L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling* 8(3): 430–457. doi:10.1207/S15328007SEM0803_5.

Esping-Andersen, G. and Billari, F.C. (2015). Re-theorizing family demographics. *Population and Development Review* 41(1): 1–31. doi:10.1111/j.1728-4457.2015.00024.x.

Fishbein, M. and Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley.

Fisher, A.J., Medaglia, J.D., and Jeronimus, B.F. (2018). Lack of group-to-individual generalizability is a threat to human subjects research. *Proceedings of the National Academy of Sciences* 115(27): E6106–E6115. doi:10.1073/pnas.1711978115.

Fuwa, M. (2014). Work-family conflict and attitudes toward marriage. *Journal of Family Issues* 35(6): 731–754. doi:10.1177/0192513X12474631.

Goldscheider, F., Bernhardt, E., and Lappegård, T. (2015). The gender revolution: A framework for understanding changing family and demographic behaviour. *Population and Development Review* 41(2): 207–239. doi:10.1111/j.1728-4457. 2015.00045.x.

Gray, E., Evans, A., and Reimondos, A. (2013). Childbearing desires of childless men and women: When are goals adjusted? *Advances in Life Course Research* 18(2): 141–149. doi:10.1016/j.alcr.2012.09.003.

Greenhaus, J.H. and Beutell, N.J. (1985). Sources of conflict between work and family roles. *The Academy of Management Review* 10(1): 76–88. doi:10.5465/amr.1985. 4277352.

Gubernskaya, Z. (2010). Changing attitudes toward marriage and children in six countries. *Sociological Perspectives* 53(2): 179–200. doi:10.1525/sop.2010.53. 2.179.

Hassan, R. and Benjamin, G. (1976). Ethnic outmarriage rates in Singapore: The influence of traditional sociocultural organization. In: Banks, D.J. (ed.). *Changing identities in modern Southeast Asia*. De Gruyter Mouton: 111–126. doi:10.1515/9783110809930.111.

Hiekel, N. and Castro-Martín, T. (2014). Grasping the diversity of cohabitation: Fertility intentions among cohabiters across Europe. *Journal of Marriage and Family* 76(3): 489–505. doi:10.1111/jomf.12112.

Himawan, K.K., Bambling, M., and Edirippulige, S. (2018). The Asian single profiles: Discovering many faces of never married adults in Asia. *Journal of Family Issues* 39(14): 3667–3689. doi:10.1177/0192513X18789205.

Himawan, K.K. (2019). Either I do or I must: An exploration of the marriage attitudes of Indonesian singles. *The Social Science Journal (Fort Collins)* 56(2): 220–227. doi:10.1016/j.socsij.2018.07.007.

Hong Kong Census and Statistics Department (2020). Fertility trend in Hong Kong, 1981 to 2019 [electronic resource]. Hong Kong: Census and Statistics Department. https://www.censtatd.gov.hk/hkstat/sub/sp160.jsp?productCode=FA100090.

Howard, M.C. and Hoffman, M.E. (2018). Variable-centered, person-centered, and person-specific approaches: Where theory meets the method. *Organizational Research Methods* 21(4): 846–876. doi:10.1177/1094428117744021.

Inglehart, R. (1977). *The silent revolution: Changing values and political styles among Western publics*. New Jersey: Princeton University Press.

Inglehart, R. and Baker, W.E. (2000). Modernization, cultural change, and the persistence of traditional values. *American Sociological Review* 65(1): 19–51. doi:10.2307/26 57288.

Jones, B.L., Hill, E.J., and Miller, R.B. (2020). Family routines and family satisfaction in Singapore: Work–family fit as a moderator. *Asia Pacific Journal of Human Resources* 58(1): 24–45. doi:10.1111/1744-7941.12215.

Jones, G.W. (2005). The 'flight from marriage' in South-east and East Asia. *Journal of Comparative Family Studies* 36(1): 93–119. doi:10.3138/jcfs.36.1.93.

Jones, G.W. (2007). Delayed marriage and very low fertility in Pacific Asia. *Population and Development Review* 33(3): 453–478. doi:10.1111/j.1728-4457.2007.001 80.x.

Jones, G.W. and Yeung, W.-J.J. (2014). Marriage in Asia. *Journal of Family Issues* 35(12): 1567–1583. doi:10.1177/0192513X14538029.

Jones, G.W., Zhang, Y., and Chia, P. (2012). Understanding high levels of singlehood in Singapore. *Journal of Comparative Family Studies* 43(5): 731–750. doi:10.3138/jcfs.43.5.731.

Kamata, A., Kara, Y., Patarapichayatham, C., and Lan, P. (2018). Evaluation of analysis approaches for latent class analysis with auxiliary linear growth model. *Frontiers in Psychology* 9: 130–130. doi:10.3389/fpsyg.2018.00130.

Kim, E.H.-W. and Cheung, A.K.-L. (2015). Women's attitudes toward family formation and life stage transitions: A longitudinal study in Korea. *Journal of Marriage and Family* 77(5): 1074–1090. doi:10.1111/jomf.12222.

Kim, M. and Hunter, J.E. (1993). Relationships among attitudes, behavioral intentions, and behavior: A meta-analysis of past research, part 2. *Communication Research* 20(3): 331–364. doi:10.1177/009365093020003001.

Koo, E. (2019). Women's subordination in Confucian culture: Shifting breadwinner practices. *Asian Journal of Women's Studies* 25(3): 417–436. doi:10.1080/12 259276.2019.1648065.

Lesthaeghe, R. (2010). The unfolding story of the second demographic transition. *Population and Development Review* 36(2): 211–251. doi:10.1111/j.1728-4457. 2010.00328.x.

Lesthaeghe, R. (2020). The second demographic transition, 1986–2020: Sub-replacement fertility and rising cohabitation—a global update. *Genus* 76(1): 1–38. doi:10.1186/s41118-020-00077-4.

Li, N.P., Lim, A.J.Y., Tsai, M., and O, J. (2015). Too materialistic to get married and have children? *PloS One* 10(5): e0126543–e0126543. doi:10.1371/journal.pone. 0126543.

Lim, J. (2020, October 5). The big read: Gender equality in Singapore remains elusive amid entrenched attitudes about women's roles. *Channel News Asia*. https://www.channelnewsasia.com/singapore/the-big-read-singapore-gender-equality-women-roles-1968061.

Lim, A. (2019). Confucian masculinity: State advocacy of active fatherhood in Singapore. *Men and Masculinities* 24(1): 46–63. doi:10.1177/1097184X19867 389.

Lo, Y., Mendell, N.R., and Rubin, D.B. (2001). Testing the number of components in a normal mixture. *Biometrika* 88(3): 767–778. doi:10.1093/biomet/88.3.767.

Magnusson, D. and Stattin, H. (2006). The person in context: A holistic-interactionistic approach. In: Lerner, R.M. and Damon, W. (eds.). *Handbook of child psychology: Theoretical models of human development*. New York: John Wiley and Sons: 400–464. doi:10.1002/9780470147658.chpsy0108.

McCutcheon, A.L. (1987). *Latent class analysis*. Thousand Oaks: SAGE. doi:10.4135/ 9781412984713.

McDonald, P. (2000). Gender equity in theories of fertility transition. *Population and Development Review* 26(3): 427–439. doi:10.1111/j.1728-4457.2000.00427.x.

Meyer, J.P. and Morin, A.J.S. (2016). A person-centered approach to commitment research: Theory, research, and methodology. *Journal of Organizational Behavior* 37: 584–612. doi:10.1002/job.2085.

Miller, W.B. (1986). Why some women fail to use their contraceptive method: A psychological investigation. *Family Planning Perspectives* 18(1): 27–32. doi:10.2307/2135198.

Miller, W.B. and Pasta, D.J. (1988). A model of fertility motivation, desires, and expectations early in women's reproductive careers. *Social Biology* 35(3–4): 236–250. doi:10.1080/19485565.1988.9988704.

Miller, W.B. and Pasta, D.J. (1995). Behavioral intentions: Which ones predict fertility behavior in married couples? *Journal of Applied Social Psychology* 25(6): 530–555. doi:10.1111/j.1559-1816.1995.tb01766.x.

Morin, A.J.S., Gagné, M., and Bujacz, A. (2016). Call for papers: Person-centered methodologies in the organizational sciences. *Organizational Research Methods* 19: 8–9. doi:10.1177/1094428118773856.

Murphy, R., Tao, R., and Lu, X. (2011). Son preference in rural China: Patrilineal families and socioeconomic change. *Population and Development Review* 37(4): 665–690. doi:10.1111/j.1728-4457.2011.00452.x.

Muthén, B. and Muthén, L.K. (2000). Integrating person-centered and variable-centered analyses: Growth mixture modeling with latent trajectory classes. *Alcoholism, Clinical and Experimental Research* 24(6): 882–891. doi:10.1111/j.1530-0277.2000.tb02070.x.

Muthén, L.K. and Muthén, B.O. (2017). *Mplus user's guide* (8th ed.). Los Angeles: Muthén and Muthén.

National Institute of Population and Social Security Research (2017). The Japanese National Fertility Survey [electronic resource]. Japan: National Institute of Population and Social Security Research. http://www.ipss.go.jp/ps-doukou/e/doukou15/Nfs15_gaiyoEng.html.

Nylund, K.L., Asparouhov, T., and Muthén, B.O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling* 14(4): 535–569. doi:10.1080/10705510701575396.

Nylund-Gibson, K. and Choi, A.Y. (2018) Ten frequently asked questions about latent class analysis. *Translational Issues in Psychological Science* 4(4): 440–461. doi:10.1037/tps0000176.

Ofstedal, M.B., Knodel, J., and Chayovan, N. (1999). Intergenerational support and gender: A comparison of four Asian countries. *Asian Journal of Social Science* 27(2): 21–41. doi:10.1163/030382499X00039.

Organisation for Economic Co-operation and Development (2017). OECD family database [electronic resource]. Paris: OECD Publishing. http://www.oecdkorea.org/resource/download/2017/eng/SF_2_4_Share_births_outside_marriage.pdf.

Oshio, T., Nozaki, K., and Kobayashi, M. (2013). Division of household labor and marital satisfaction in China, Japan, and Korea. *Journal of Family and Economic Issues* 34(2): 211–223. doi:10.1007/s10834-012-9321-4.

Pieterse, J.N. (1996). Globalisation and culture: Three paradigms. *Economic and Political Weekly* 31(23): 1389–1393.

Poortman, A-R. and Liefbroer, A.C. (2010). Singles' relational attitudes in a time of individualization. *Social Science Research* 39(6): 938–949. doi:10.1016/j.ss research.2010.03.012.

Powell, G.N. and Greenhaus, J.H. (2010). Sex, gender, and the work-to-family interface: Exploring negative and positive interdependencies. *Academy of Management Journal* 53(3): 513–534. doi:10.5465/amj.2010.51468647.

Ramdas, K. (2012). Women in waiting? Singlehood, marriage, and family in Singapore. *Environment and Planning* 44(4): 832–848. doi:10.1068/a4444.

Raymo, J.M. and Park, H. (2020). Marriage decline in Korea: Changing composition of the domestic marriage market and growth in international marriage. *Demography* 57(1): 171–194. doi:10.1007/s13524-019-00844-9.

Raymo, J.M., Park, H., Xie, Y., and Yeung, W.-J.J. (2015). Marriage and family in East Asia: Continuity and change. *Annual Review of Sociology* 41(1): 471–492. doi:10.1146/annurev-soc-073014-112428.

Raymo, J.M., Uchikoshi, F., and Yoda, S. (2021). Marriage intentions, desires, and pathways to later and less marriage in Japan. *Demographic Research* 41(3): 67–98. doi:10.4054/DemRes.2021.44.3.

Sassler, S. and Lichter, D.T. (2020). Cohabitation and marriage: Complexity and diversity in union-formation patterns. *Journal of Marriage and Family* 82(1): 35–61. doi:10.1111/jomf.12617.

Sayer, L.C., Bianchi, S.M., and Robinson, J.P. (2004). Are parents investing less in children? Trends in mothers' and fathers' time with children. *The American Journal of Sociology* 110(1): 1–43. doi:10.1086/386270.

Schwartz, G. (1978). Estimating the dimension of a model. *The Annals of Statistics* 6: 461–464. doi:10.1214/aos/1176344136.

Shepherd, H. and Marshall, E.A. (2019). Childbearing worldviews and contraceptive behavior among young women. *Journal of Marriage and Family* 81(5): 1144–1161. doi:10.1111/jomf.12581.

Sim, J.B.Y. and Chow, L.T. (2019). Confucian thinking in Singapore's citizenship education. *Journal of Moral Education* 48(4): 465–482. doi:10.1080/03057240.2018.1556155.

Singapore Department of Statistics (2021). *Population and population structure* [electronic resource]. Singapore: Department of Statistics. https://www.singstat.gov.sg/find-data/search-by-theme/population/population-and-population-structure/latest-data.

Singapore Department of Statistics (2020a). Births and fertility [electronic resource]. Singapore: Department of Statistics. https://www.singstat.gov.sg/find-data/search-by-theme/population/births-and-fertility/latest-data.

Singapore Department of Statistics (2020b). Marital status, marriages and divorce [electronic resource]. Singapore: Department of Statistics. https://www.singstat.gov.sg/find-data/search-by-theme/population/marital-status-marriages-and-divorces/latest-data.

Singapore Department of Statistics (2020c). Census of Population 2020 [electronic resource]. Singapore: Department of Statistics. https://www.singstat.gov.sg/-/media/files/publications/cop2020/sr1/findings.pdf.

Singapore Department of Statistics (2010). Census of Population 2010 [electronic resource]. Singapore: Department of Statistics. https://www.singstat.gov.sg/publications/cop2010/cop2010-sr1.

Singapore Ministry of Education (2022). Sexuality education: Scope and teaching approach [electronic resource]. Singapore: Ministry of Education. https://www.moe.gov.sg/education-in-sg/our-programmes/sexuality-education/scope-and-teaching-approach.

Singapore Ministry of Manpower (2020). Hours of work, overtime and rest [electronic resource]. Singapore: Ministry of Manpower. https://www.mom.gov.sg/employment-practices/hours-of-work-overtime-and-rest-days.

Singapore Registry of Births and Deaths (2019). Report on registration of births and deaths 2019 [electronic resource]. Singapore: Immigration and Checkpoints Authority. https://www.ica.gov.sg/docs/default-source/ica/stats/annual-bd-statistics/stats_2019_annual_rbd_report.pdf.

Sobotka, T., Skirbekk, V., and Philipov, D. (2011). Economic recession and fertility in the developed world. *Population and Development Review* 37(2): 267–306. doi:10.1111/j.1728-4457.2011.00411.x.

Statistics Bureau of Japan (2020). Statistical handbook of Japan 2020 [electronic resource]. Japan: Ministry of Internal Affairs and Communications. https://www.stat.go.jp/english/data/handbook/pdf/2020all.pdf#page=17.

Statistics Korea (2020). Birth and death [electronic resource]. Daejeon, South Korea: Statistics Korea. http://kostat.go.kr/portal/eng/pressReleases/8/10/index.board.

Strijbosch, K. (2015). Single and the city: State influences on intimate relationships of young, single, well-educated women in Singapore. *Journal of Marriage and Family* 77(5): 1108–1125. doi:10.1111/jomf.12221.

Surkyn, J. and Lesthaeghe, R. (2004). Value orientations and the Second Demographic Transition (SDT) in Northern, Western and Southern Europe: An update. *Demographic Research* SC3(3): 45–86. doi:10.4054/DemRes.2004.S3.3.

Tai, T., Yi, C., and Liu, C. (2019). Early marriage in Taiwan: Evidence from panel data. *Journal of Family Issues* 40(14): 1989–2014. doi:10.1177/0192513X19863211.

Takeuchi, M. and Tsutsui, J. (2016). Combining egalitarian working lives with traditional attitudes: Gender role attitudes in Taiwan, Japan, and Korea. *International Journal of Japanese Sociology* 25(1): 100–116. doi:10.1111/ijjs.12039.

Teo, Y.Y. (2013). Support for deserving families: Inventing the anti-welfare familialist state in Singapore. *Social Politics* 20(3): 387–406. doi:10.1093/sp/jxt004.

Thornton, A. (1989). Changing attitudes toward family issues in the United States. *Journal of Marriage and the Family* 51(4): 873–893. doi:10.2307/353202.

Thornton, A. and Young-DeMarco, L. (2001). Four decades of trends in attitudes toward family issues in the United States: The 1960s through the 1990s. *Journal of Marriage and Family* 63(4): 1009–1037. doi:10.1111/j.1741-3737.2001.01009.x.

Thornton, A. (2013). Reading history sideways: The fallacy and enduring impact of the developmental paradigm on family life. Chicago: University of Chicago Press.

Treas, J., Lui, J., and Gubernskaya, Z. (2014). Attitudes on marriage and new relationships: Cross-national evidence on the deinstitutionalization of marriage. *Demographic Research* 30(54): 1495–1526. doi:10.4054/DemRes.2014.30.54.

van de Kaa, D.J. (1987). Europe's second demographic transition. *Population Bulletin* 42(1): 1–59.

Waller, M. and McLanahan, S. (2005). 'His' and 'her' marriage expectations: Determinants and consequences. *Journal of Marriage and Family* 67(1): 53–67. doi:10.1111/j.0022-2445.2005.00005.x.

Willoughby, B.J. (2014). Using marital attitudes in late adolescence to predict later union transitions. *Youth and Society* 46(3): 425–440. doi:10.1177/0044118X12436700.

Willoughby, B.J., Hall, S.S., and Luczak, H.P. (2015). Marital paradigms: A conceptual framework for marital attitudes, values, and beliefs. *Journal of Family Issues* 36(2): 188–211. doi:10.1177/0192513X13487677.

Yap, M.T. (2013). POPS (6): Perceptions of singles on marriage and having children. Institute of Policy Studies, Public Data Sharing Platform.

Yeung, W.-J.J. and Hu, S. (2016). Paradox in marriage values and behavior in contemporary China. *Chinese Journal of Sociology* 2(3): 447–476. doi:10.1177/2057150X16659019.

Yoshida, A. (2017). *Unmarried women in Japan: The drift into singlehood*. New York: Routledge. doi:10.4324/9781315716503.

Yu, J. and Xie, Y. (2015). Cohabitation in China: Trends and determinants. *Population and Development Review* 41(4): 607–628. doi:10.1111/j.1728-4457.2015.00087.x.

Yucel, D. (2015). What predicts egalitarian attitudes towards marriage and children: Evidence from the European Values Study. *Social Indicators Research* 120(1): 213–228. doi:10.1007/s11205-014-0580-3.

Zaidi, B. and Morgan, S.P. (2017). The second demographic transition theory: A review and appraisal. *Annual Review of Sociology* 43(1): 473–492. doi:10.1146/annurev-soc-060116-053442.

Zainal, H. (2018). Intersectional identities: Influences of religion, race, and gender on the intimate relationships of single Singaporean Malay-Muslim women. *Marriage and Family Review* 54(4): 351–373. doi:10.1080/01494929.2017.1414725.

Zheng, W., Zhou, X., Zhou, C., Liu, W., Li, L., and Hesketh, T. (2011). Detraditionalisation and attitudes to sex outside marriage in China. *Culture, Health and Sexuality* 13(5): 497–511. doi:10.1080/13691058.2011.563866.

Appendix

Table A-1:   Comparison of population and unweighted sample distribution

Variable	Population	Unweighted sample
Age		
20–24	0.42	0.43
25–29	0.31	0.36
30–34	0.16	0.15
35–39	0.11	0.07
Sex		
Male	0.55	0.58
Female	0.45	0.42
University education		
No	0.64	0.57
Yes	0.36	0.43
Ethnicity		
Chinese	0.77	0.63
Malay	0.13	0.21
Indian	0.07	0.13
Other	0.03	0.03

Source: Author's calculations from the Singapore Census of Population, 2010, and the Perceptions of Singles on Marriage and Having Children survey, 2012.
Note: Proportions are presented in the table.

Table A-2:   Summary statistics for the sample

Variable	Proportion
Sociodemographic characteristics	
Mean age (SD)	27.26 (0.14)
Sex	
Male	0.55
Female	0.45
Relationship status	
Not dating	0.54
Dating	0.12
In a relationship	0.32
Living with a partner	0.02
University education	
No	0.60
Yes	0.40
Ethnicity	
Chinese	0.77
Malay	0.13
Indian	0.07
Other	0.03
Attitudinal indicators	
Marriage and family	
Life is incomplete without marriage.	0.57
Marital companionship is replaceable by meaningful friendship.*	0.47
Marriage incurs unnecessary responsibilities.*	0.71
Marriage provides a spouse with emotional stability.	0.75
Cohabitation and premarital sex	
Sex is only acceptable within a marriage.	0.55
One can only have children if married.	0.63
If a man and woman want to live together before marriage, do you feel this is unacceptable?	0.30
How about an unmarried couple having children? Do you think this is unacceptable?	0.51
Parenthood	
Life is incomplete without children.	0.58
Having children is important for an adult to live a fulfilled life.	0.67
Children are an unnecessary burden.*	0.87
Children provide the support needed in old age.	0.62

Table A-2:   (Continued)

Variable	Proportion
Work–family roles	
Marriage will hinder education and career pursuits.*	0.64
Marriage puts an end to independence and freedom.*	0.68
Children hinder education and career pursuits.*	0.61
Children put an end to independence and freedom.*	0.62
Gender roles	
Being a housewife is just as fulfilling as working for pay.	0.54
A preschool child is likely to suffer if their mother works.	0.46
A job is alright, but what most women really want is a home and children.	0.63
Children often suffer because their fathers concentrate too much on their work.	0.65
If parents divorce, it is better for the child to stay with the mother than with the father.	0.48
If a woman earns more than her husband, it is not good for the relationship.	0.21
Women should be able to decide how to spend the money they earn without having to ask their husband's permission.*	0.26
For a man, looking after the home or family is just as fulfilling as working for pay.*	0.37
A working mother can establish just as warm and secure a relationship with her children as a housewife.*	0.28
Having a job is the best way for a woman to be independent.*	0.39
Marriage desires	
Yes	0.69
No	0.31

Source: Author's calculations based on the Perceptions of Singles on Marriage and Having Children survey, 2012.
Note: Items with asterisks (*) are reverse coded; a higher proportion indicates more traditional attitudes. All values are adjusted for sample weights.

Table A-3:   Proportions of missing values on observed attitudinal indicators

Number of indicators missed	Proportion
0	0.341
1	0.256
2	0.156
3	0.089
4	0.070
5	0.033
6	0.018
7	0.014
8	0.007
9	0.004
10	0.004
11	0.005
12	0.001
13	0.001
15	0.001

Note: There are a total of 26 observed attitudinal indicators for the LCA model. This table shows the number of indicators that were missed. For example, 0.341 of the sample missed zero questions, 0.256 of the sample missed one question, and 0.156 of the sample missed two questions. Overall, more than 90% of the sample missed four or fewer indicators. All respondents answered at least 11 out of the 26 indicators.

Figure A-1: Latent class model selection using the Bayesian information criterion (BIC) and the Akaike information criterion (AIC)
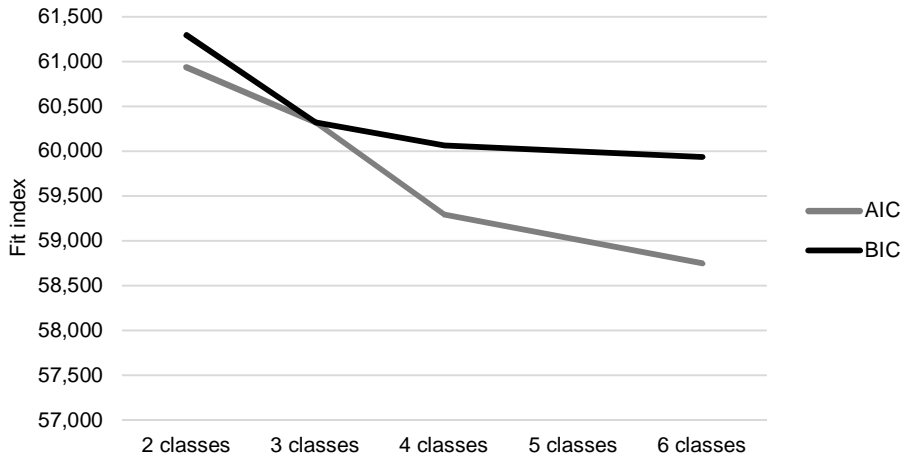
Differences in AIC and BIC by class

Class	AIC	Δ AIC	BIC	Δ BIC
2	60,936	–	61,294	–
3	60,324	−612	60,324	−970
4	59,295	−1030	60,066	−258
5	59,025	−270	60,003	−63
6	58,749	−276	59,934	−69

Note: Lower values indicate improved model fit.

Table A-4: Conditional probabilities of attitudinal indicators by subgroup (N = 1,980)

	Never-married subgroups			
Attitudinal indicators	Family conservatives	Conflicted conservatives	Family progressives	Family skeptics
Marriage and family				
Life is incomplete without marriage.				
Disagree	18%	22%	72%	93%
Agree	82%	78%	28%	7%
Marital companionship is replaceable by meaningful friendship.				
Disagree	56%	44%	45%	37%
Agree	44%	56%	55%	63%
Marriage incurs unnecessary responsibilities.				
Disagree	83%	52%	85%	53%
Agree	17%	48%	15%	47%
Marriage provides a spouse with emotional stability.				
Disagree	18%	14%	33%	45%
Agree	82%	86%	67%	55%
Cohabitation and premarital sex				
Sex is only acceptable within a marriage.				
Disagree	29%	35%	70%	62%
Agree	71%	66%	30%	38%
One can only have children if married.				
Disagree	25%	21%	62%	55%
Agree	75%	79%	38%	45%
If a man and woman want to live together before marriage, do you feel this is:				
Unacceptable	40%	34%	17%	20%
Acceptable	60%	66%	83%	80%
How about an unmarried couple having children? Do you think this is:				
Unacceptable	64%	62%	29%	38%
Acceptable	36%	38%	71%	62%
Parenthood				
Life is incomplete without children.				
Disagree	16%	18%	75%	91%
Agree	84%	82%	25%	9%
Having children is important for an adult to live a fulfilled life.				
Disagree	8%	9%	59%	87%
Agree	93%	91%	41%	13%
Children are an unnecessary burden.				
Disagree	95%	76%	96%	77%
Agree	5%	24%	4%	23%
Children provide the support needed in old age.				
Disagree	23%	24%	57%	67%
Agree	78%	76%	43%	33%

Table A-4: (Continued)

Attitudinal indicators	Never-married subgroups			
	Family conservatives	Conflicted conservatives	Family progressives	Family skeptics
Work–family roles				
Marriage will hinder education and career pursuits.				
Disagree	80%	27%	90%	49%
Agree	20%	73%	10%	52%
Marriage puts an end to independence and freedom.				
Disagree	87%	32%	95%	46%
Agree	13%	68%	6%	54%
Children put an end to independence and freedom.				
Disagree	88%	21%	90%	28%
Agree	12%	79%	10%	72%
Children hinder education and career pursuits.				
Disagree	82%	21%	87%	34%
Agree	18%	79%	13%	66%
Gender roles				
Being a housewife is just as fulfilling as working for pay.				
Disagree	41%	50%	42%	56%
Agree	59%	50%	58%	44%
A preschool child is likely to suffer if their mother works.				
Disagree	55%	37%	74%	48%
Agree	45%	63%	26%	52%
A job is alright, but what most women really want is a home and children.				
Disagree	18%	23%	61%	65%
Agree	82%	77%	39%	35%
Children often suffer because their fathers concentrate too much on their work.				
Disagree	32%	24%	49%	41%
Agree	68%	76%	51%	59%
If parents divorce, it is better for the child to stay with the mother than with the father.				
Disagree	47%	32%	75%	62%
Agree	53%	68%	25%	38%
If a woman earns more than her husband, it is not good for the relationship.				
Disagree	82%	62%	93%	76%
Agree	18%	39%	7%	24%
Women should be able to decide how to spend the money they earn without having to ask their husband's permission.				
Disagree	30%	22%	25%	22%
Agree	70%	78%	76%	78%
For a man, looking after the home or family is just as fulfilling as working for pay.				
Disagree	34%	40%	33%	45%
Agree	66%	60%	67%	55%

Table A-4:   (Continued)

Attitudinal indicators	Never-married subgroups			
	Family conservatives	Conflicted conservatives	Family progressives	Family skeptics
A working mother can establish just as warm and secure a relationship with her children as a housewife.				
Disagree	26%	28%	24%	36%
Agree	75%	72%	76%	64%
Having a job is the best way for a woman to be independent.				
Disagree	42%	25%	57%	32%
Agree	59%	75%	44%	69%
Group size	730	479	431	340
Group percentage	37%	24%	22%	17%

Note: The model controlled for age, gender, educational attainment, ethnicity, and relationship status.