From Singlehood to Marriage

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Abstract

Marriage is a key factor in Singapore's fertility crisis: increasing marriage rates and lowering the median age at first marriage have a direct bearing on the birth rate. However, the trend of Singaporeans not marrying or marrying later has persisted for several years. The two reasons most frequently cited for not marrying are: not having met a suitable partner, and choosing to concentrate on studies or career. To explore the dynamics of available singles in search of a life partner, System Dynamics modeling is used to find the answers to the following questions: What goes on in the search for someone eligible? What factors influence the success of such a search? What are the variables affecting decisions to get married or wait for a better match? What is the relative importance of different sets of variables in influencing such decisions? Some of the findings are that ample supply and consumption of match-making services is counter-productive; and that engaging the help of external parties such as employers, community and religious bodies, educational institutions, professional associations and others to create group participation opportunities for singles can do much more for the marriage rate than relying predominantly on private dating agencies.

Key words: singlehood, marriage, life-partner, match-making, Singapore

1. INTRODUCTION

Like many countries in Asia, Singapore has experienced rapid decline in the total fertility rate (TFR)[1] of its resident population since the 1950s. For more than three decades now, the TFR has been below the replacement rate of 2.1. In 2013, the TFR of this island-state in Southeast Asia was 1.29.

This persistent low fertility, coupled with increasing life expectancy[2], has led to a shrinking and ageing citizen population. Out of a total population of 5.4 million as of June 2013, there were only 3.31 million Singapore citizens. 0.53 million permanent residents and 1.55 million non-residents, comprising mainly foreign workers and students, formed the remainder of the population (Department of Statistics, 2013). The natural growth in citizen numbers has been decreasing steadily over the years, and will begin to decline from around 2025.

While the government has been successful in attracting immigrant labour and new citizens to help sustain the economy and keep the population decline in check, their efforts to increase its TFR have been far less successful.

Marriage - a Key Factor in Singapore's Fertility Crisis

The TFR, while a useful indicator for tracking fertility trends, may not be a suitable measure for population planning. Even if it could be increased to 2.1, the population would not be able to replace itself unless the TFR was maintained at 2.1 over a long period of time. It has been suggested, by Cheung (2009) that a more accurate measure would be to look at the number of births by birth cohorts and to study inter-cohort changes, and that the key to increasing the birth rate lay in increasing marriage rates and lowering the median age at first marriage.

However, the trend of Singaporean citizens not marrying or marrying later has persisted for several years. From 2000 to 2011, the proportion of citizens who remained single in the 30 to 34 age group increased from 33% to 44% for males and from 22% to 31% for females. Those who got married did so later: in the same period, the median age at first marriage increased from 28.5 to 30.1 for males and 26.1 to 27.8 for females. (National Population and Talent Division, 2012)

Singapore is not alone; this trend is indeed regarded as a "regional transition to new behavior" in Asia, triggered by social and economic changes. These include the erosion of traditional practices such as arranged marriages, greater opportunities for education for young people, changing aspirations and expectations and an increase of females in the labour force. These have led to changes in attitudes towards singlehood, marriage and parenthood, resulting in sharply declining fertility levels in Asia, where childbearing occurs primarily within marriage.

Singapore's Solution: The Social Development Network

Yet, marriage remains desirable to Singaporeans. The Marriage & Parenthood (M&P) Study 2012, a survey commissioned by NPTD (2012) to understand the attitudes and motivations behind Singapore residents' marriage and parenthood trends, reported that 83% of the single respondents indicated their desire to get married. The two reasons most frequently cited for not marrying were: (1) not having met a suitable partner, and (2) desire to concentrate on studies or career.

In 2008, the budget promoting marriage and parenthood was doubled with the introduction of the enhanced M&P Package (Ministry of Finance, 2009). This package, which was further enhanced in 2013, mostly included incentives and initiatives to encourage married couples to have more children and to support better work-life balance.

To boost marriage rates, the package had enhanced programmes for singles. This involved the merging of the 25-year-old Social Development Unit (SDU) and Social Development Services (SDS) into the Social Development Network (SDN). SDN would be "the centre of the entire dating network", responsible for developing, accrediting and collaborating with private match-making agencies to support singles in their search for life partners. With SDN, it was hoped that the decline in marriage rate and delay in marrying could be reversed.

2. PURPOSE OF THE INVESTIGATION

To explore the dynamics of available singles in search of a life partner, System Dynamics modeling is used to find the answers to the following questions:

- What goes on in the search for someone eligible? What factors influence the success of such a search?
- What are the variables affecting decisions to get married or wait for a better match? What is the relative importance of different sets of variables in influencing such decisions?
- What suggestions can be offered in support of SDN's role as the centre of Singapore's dating network?

3. CONCEPTS & CAUSAL RELATIONSHIPS

The system dynamics model in this paper was created in 2008 based on my mental model – my knowledge and understanding, gained through observation, personal experience and reflections. Through these, I developed the concepts relevant to the dating process. These concepts centred on the enquiry "What is the role of introductions, dating and match-making services in the search for a life partner?" and "What factors influence delays in making a life partner selection after an eligible candidate has been found?"

From a survey of the available literature then, I could not find studies or secondary data that were sufficiently relevant to the line of inquiry that I sought to pursue. In addition, a fairly extensive search was made then for papers presented at past years' International System Dynamics Conference, with the hope of finding fairly similar models on the search for a life partner, but none were found that dealt with this topic.

3.1 DATING DYNAMICS

Introductions, Dating Services & Social Groups

Firstly, any two persons would not become acquainted without *either* being introduced through a third party *or* one of them first taking the initiative to introduce himself / herself. Introductions are an essential precursor to relationships, regardless of whether they occur naturally or are obtained by engaging the services of a match-making agency.

A group-dating activity is comparable to a job fair that brings potential employers and employees together, while a one-to-one arranged date for enrolled members of a dating agency is like job interview, with both sides having initiated the encounter by signaling their search intention. Chance meetings rarely occur, as one would not know which of the strangers he/she passes is also looking for a life partner and the occasion for an introduction is unlikely to arise.

A social group consists of two or more people who interact with one another and who recognize themselves as a distinct social unit. Membership in social groups could occur naturally such as through kinship[3] or through voluntary or involuntary enrolment (junior college, Philosophy class, prison, Residents' committee, SDN, private dating agency). They could be relatively long-term or middle-term (neighbourhood, place of worship, place of work, gym membership) or short-term (1-week training workshop, library talk, hospital stay).

Single by Choice, Availability, Eligibility, Desirability

In every age cohort of singles, a certain proportion would choose to remain single for a period of time or even indefinitely. Other life priorities (studies/career), not having enough money, not being ready or prepared for marriage and considering oneself too young for marriage were among the top 5 reasons cited by single respondents in the 2012 M&P Study.

Available singles make up the rest of the cohort. Of these, those whom one finds eligible would possess a set or sub-set of characteristics pertaining to educational level, economic status, religious affiliation, beliefs, attitudes, values and aspirations.

Not every available single male (ASM) would be desirable as a life partner to a female and vice-versa. Physical, emotional, intellectual attributes, personality traits and inter-personal affinity play a part in affecting how desirable a person is to another.

[The model and explanation of Dating Dynamics is given on page 9.]

3.2 DYNAMICS OF SELECTING A LIFE PARTNER

When a single female (SF) meets an eligible male (EM) who in turn finds her eligible, she may decide to wait for someone better to come along rather than pick him if she believes that: (1) she can afford to wait, (2) she is likely to meet a reasonable number of EM from whom she can find a better match and (3) she is likely to be desirable to future EM whom she meets.

These three factors are captured in the following variables, which have been created for the purpose of this model: (1) fertility lifespan category, (2) perceived personal desirability and (3) expectations of cohort introductions to EM.

Fertility Lifespan Category (FLC)

This is an indicator of the amount of time a SF has before it is too late (in terms of willingness and/or capability) for her to bear a child. For the purposes of this model, we assume that a woman would be unwilling or unable to bear a child beyond 50 years of age. The FLC has three values: 5.44, 3.22 and 1, corresponding to the median fertile no. of years of 24.5 for the age cohort 20 to 29, 14.5 for cohort 30 to 39 and 4.5 for cohort 40 to 49 respectively. The higher the SF's FLC is, the longer her fertility lifespan. The FLC as also *conversely proportional* to the Probability of SF Making a Life Partner Selection: the higher the FLC (that is, the younger the SF), the more likely the SF is to wait for a better match, and therefore the less likely she is to make a life partner selection.

Perceived Personal Desirability (PPD)

This refers to the degree of desirability a SF perceives herself to have for EM in mutually eligible introductions.[4] Her self-perception is likely to be influenced by the set of personal attributes that she has, and how much value she thinks males (and society in general) value them.

The PPD has continuous values, from 0[5] to 1. In this model, a relatively high average PPD of 0.7 is assumed for SF in the 20 to 29 age group[6], and means "out of 10 EM, 7 will find me desirable". The PPD initial value used in this model is a cohort average. It is possible to obtain this average through survey methods. Like the FLI, the PPD is also conversely proportional to the Probability of SF Making a Life Partner Selection. The higher the PPD, the more desirable to future EM she considers herself to be. An SF with high PPD would expect to have high chances of pairing off with someone more eligible than any of those EM she has already met, and is thus less likely to make a life partner selection from among them.

Expectations of Cohort Introductions to EM (ECI)

This is a multiplier reflecting the number of introductions to *mutually eligible* single males that a SF expects she is likely to have while in the current age cohort. Her estimation could be shaped by information available to her, or observations she has made.

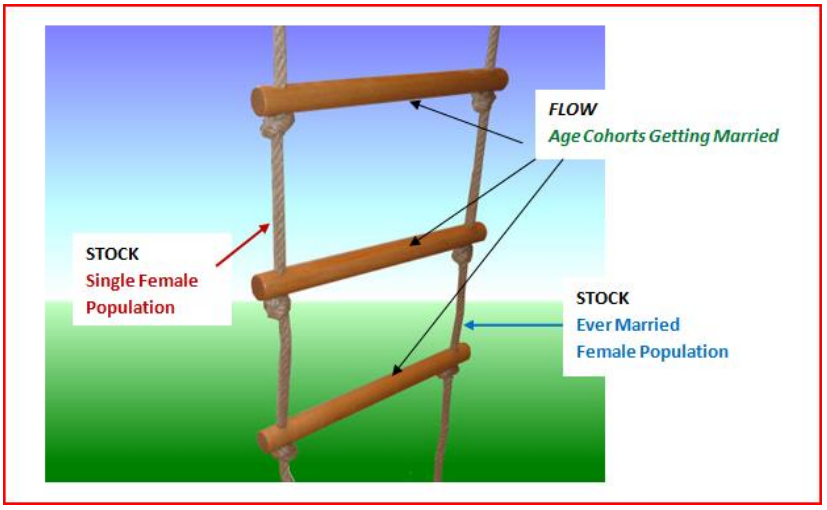
The ECI has continuous values from 0 to 1, and the ECI initial value used in the model is a cohort average. Unlike FLC and PPD, it is directly proportional to the Probability of SF Making a Life Partner Selection. An ECI of 0.1 or 1/10 indicates an expectation of having 10 mutually eligible introductions while in the cohort, while an ECI of 0.05 or 1/20 indicates an expectation of having 20 mutually eligible introductions. Thus, the smaller the ECI, the less likely the SF would be ready to commit to selecting as her life partner one of the EM that she has met.

[The model and explanation of Dynamics of Selecting a Life Partner are given on page 9.]

4. MODELLING APPROACH

The dynamics of dating, life partner selection and marriage are highly complex. It becomes many times more complicated when both sexes are included in the model. Each sex may have unique variables affecting them. Single males, for instance, may delay marriage due to army conscription, or opt for foreign brides or a homosexual partner. Marriage is also not static. With divorce or the death of a spouse, one goes back to singlehood and may or may not re-enter the marriage stock.

This model is designed with the possibility of it being used at a later stage to explore Birth Dynamics. Thus, it focuses on stocks and flows affecting the Female Population, as there is a natural progression from being single to being an ever married female with no child, one child, two children and so on.



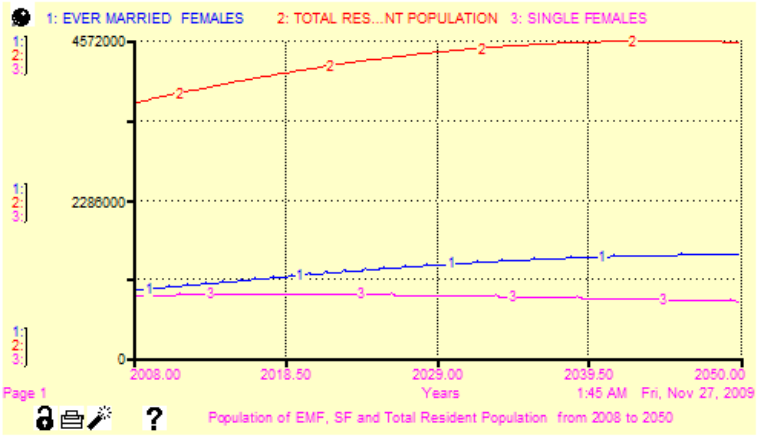
"From Singlehood to Marriage" Model - Stage 1

Using 2008 statistics, the model consists of 2 stocks – the Single Female (SF) population stock and the Ever Married Female (EMF) population stock.

(Refer to STELLA model on page 7.)

Each stock has inflows and outflows of birth, migration, ageing and death.
The 2 stocks are connected by one-way flows as SF in each age cohort (starting from 10 to 19 and ending with 40 to 49[7]) marry and thereby leave the SF stock to enter the same cohort in the EMF stock. The EMF cohorts of reproductive ages 10 to 19 up to 40 to 49 contribute to the birth of new females going in the 0 to 9 cohort.

The accuracy of the model was checked by running it from 2008 to 2050 to determine if the size of the Total Resident Population matched official projections. The graph and its results are given below.



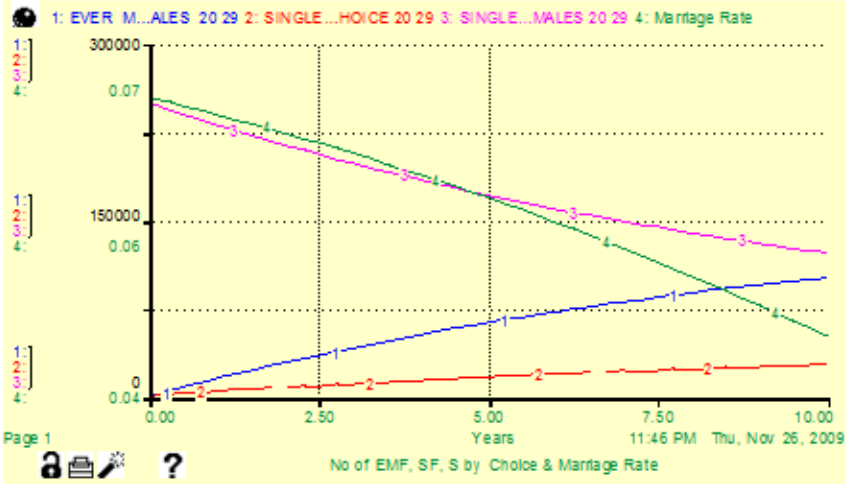
The graph obtained from has output data consistent with official projections. The total resident population increases by 23.75% from 3,679,402 in 2008 to 4,553,369 in 2050. Some reports have predicted a population of 5 million in 2050, but this model is more accurate as its birth rates are those of Ever Married Females. Most models, including Ruth-Hannon, base their birth rates on all females.

<u>"From Singlehood to Marriage" Model – Stage 2</u>
Next, taking the age cohort of 20 29, a sub-model is created to map out the interaction of variables influencing single females' decisions to get married. (See initial values in Table 1 and STELLA model on page 8.)

	STOCKS & CONVERTERS IN THE MODEL	INITIAL VALUES
1	No of SF	248,300
2	No of EMF	0
3	No of Single by Choice	0
4	No of Social Groups; Social Group Size	5; 50
5	Average Fraction of ASM Introduced to SF; Fraction of EM among ASM	0.5; 0.3
6	No of Introductions to ASM Outside of Social Groups	30
7	Probability of Staying Single	0.15
8	Fertility Lifespan Category	3
9	Perceived Personal Desirability	0.7
10	Expectations of Cohort Introductions to EM	0.1

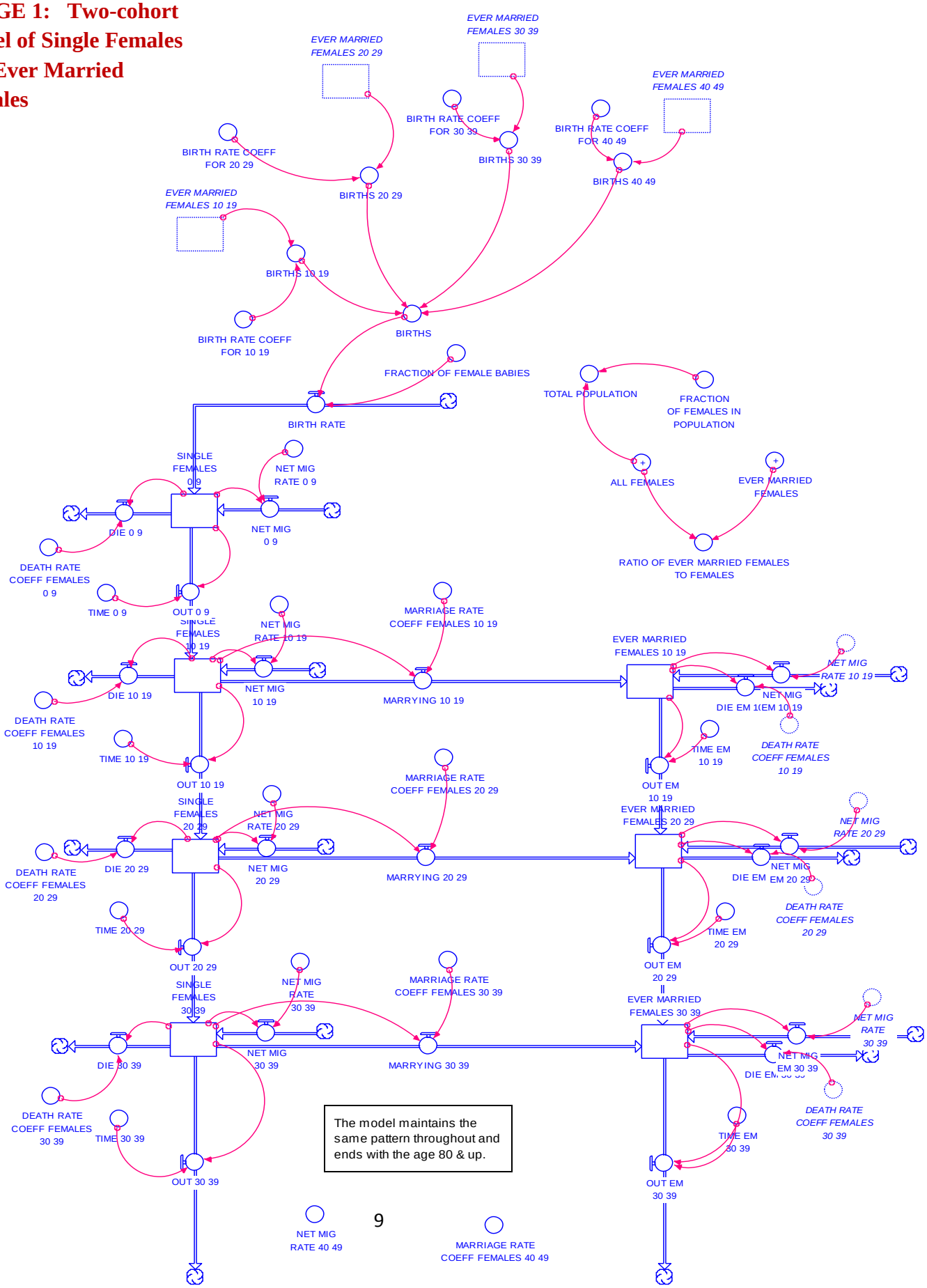
Table 2: Initial Values in the "From Singlehood to Marriage - Stage 2" model (*2008 data)

Items 4-6 are assigned estimated values based on what might be reasonably reflective of the social contexts of SF. The model was run several times (using a 10-year period), each time with the values of items 4-6 adjusted incrementally until a marriage rate close to that of 2008 was reached. (Refer to graph below.)



The graph shows what happens to the initial cohort of 248300 SF in the 20 to 29 age group after 10 years. The no. of SF is reduced by half to 121274. The no. of EMF (Ever Married Females) rise from 0 to 100492 and the no of SC (Singles by Choice) rises from 0 to 26534 – 40.5% and 10.5% of the 20 to 29 SF population respectively. The Marriage Rate is 0.07 falling to 0.05 at the end of 10 years, due to the no. moving into the SC stock.

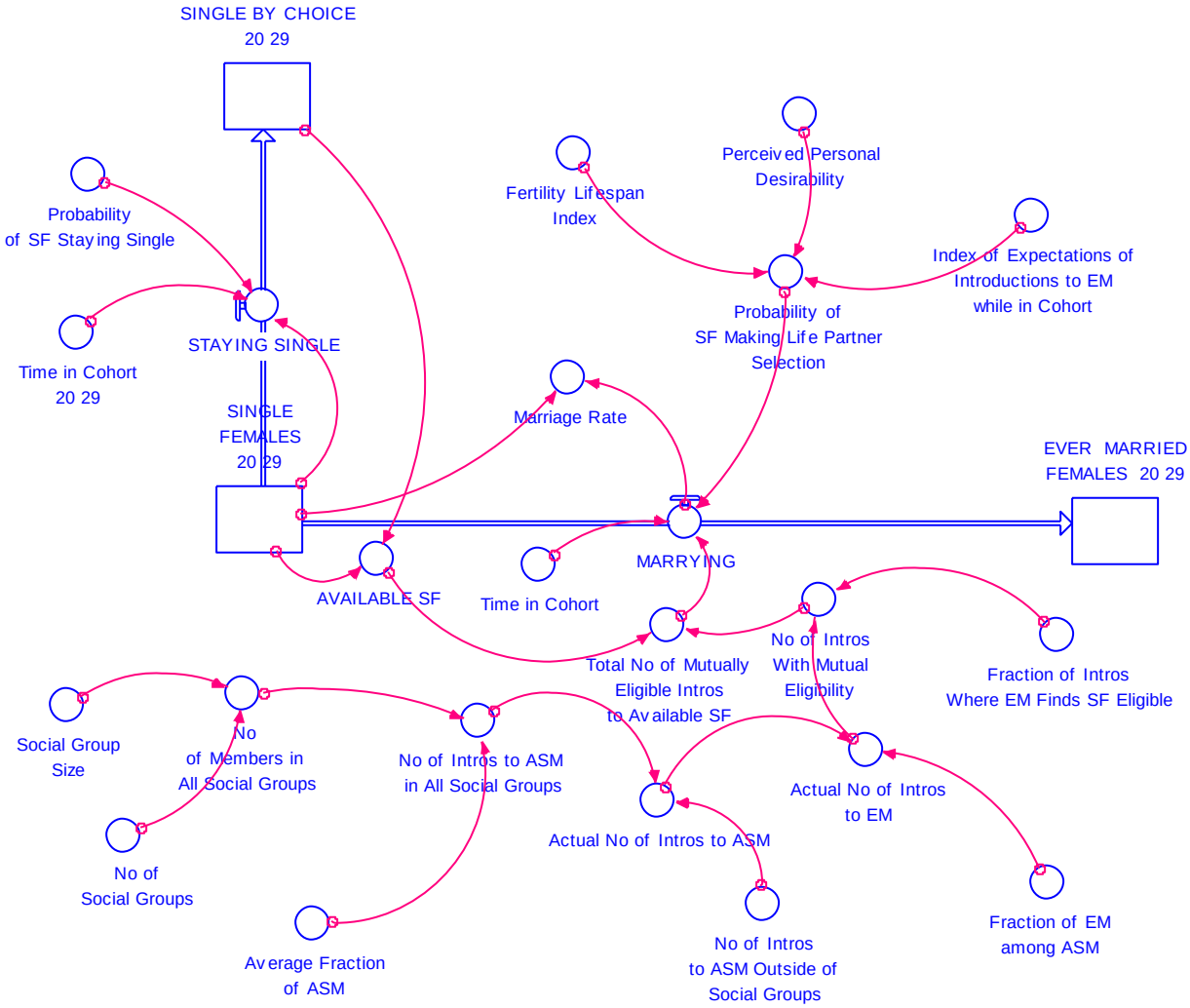
STAGE 1: Two-cohort Model of Single Females and Ever Married Females



STAGE 2: From Singlehood to Marriage Model for Age 29 to 29 Cohort

DYNAMICS OF SELECTING A LIFE PARTNER

The marriage rate is influenced by the probability of the single female making a life partner selection, which is in turn influenced by FLC, PPD and ECI.



DATING DYNAMICS

A single female's chances of marrying depend on the no of mutually eligible introductions she has, which is influenced by the no of social groups she belongs to, the size of the groups, the fraction of available single males she meets, and so on.

5. HYPOTHESIS-TESTING & ANALYSIS OF RESULTS

Sensitivity analyses are carried out with the following variables…	…. to compare the effect of the variables on
• Perceived Personal Desirability (PPD) • Fertility Lifespan Category (FLC) • Expectations of Cohort Introductions (ECI) • No of Social Groups (NSG) • Fraction of Eligible Males Among Available Single Males Introduced to SF (FEM)	• The Number of Ever Married Females at the end of 10 years • The Fraction of Ever Married Females in the Female Population at the end of 10 years • The Marriage Rate
To set up a basis for comparison, each of the variables is assigned a pair of values with a percentage difference of 444%. This figure is chosen as the percentage difference between the 2 end values of FLC, which are 5.44 and 1. At any one time, only one variable was changed to see its effect on the number and fraction of ever married females and the marriage rate.	

5.1 EFFECT OF VARIABLES ON THE NO. OF EVER MARRIED FEMALES

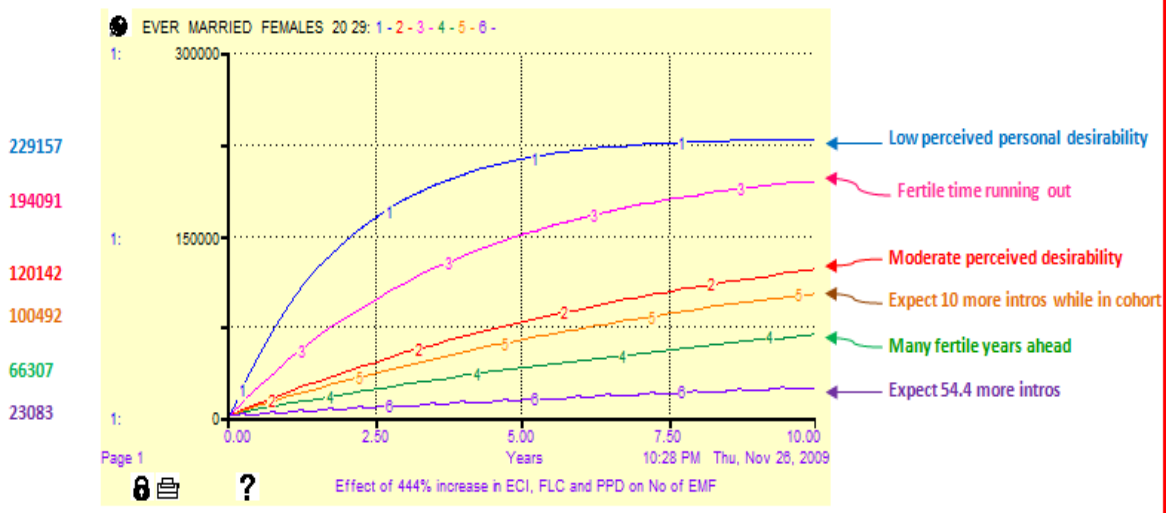


Figure 1: Comparing the effects of PPD, FLC and ECI on the number of EMF

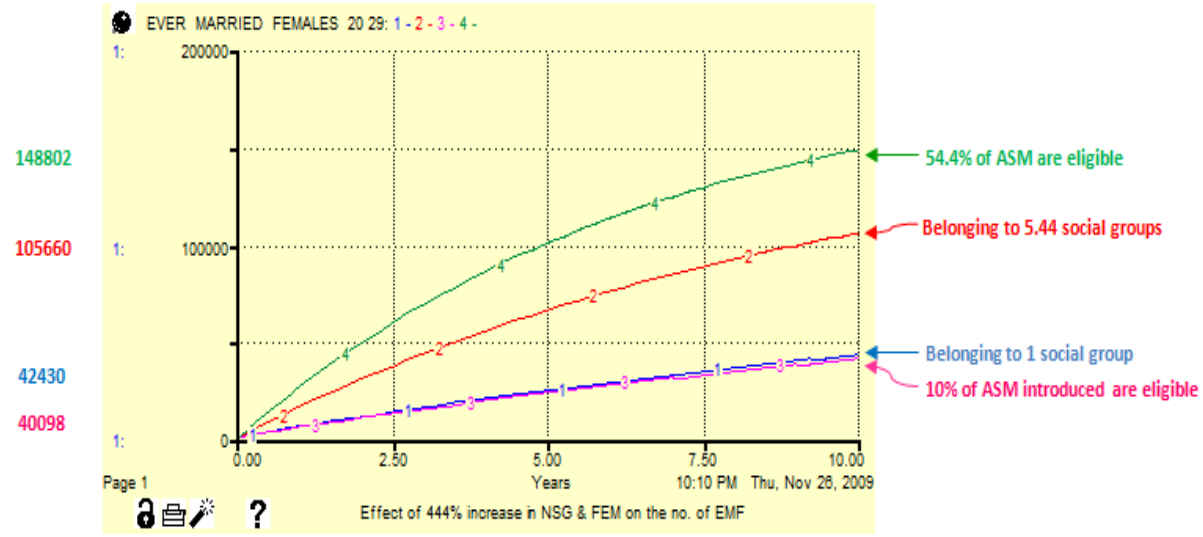


Figure 2: Comparing the effects of NSG & FEM on the number of EMF

5.2 EFFECT OF VARIABLES ON THE MARRIAGE RATE

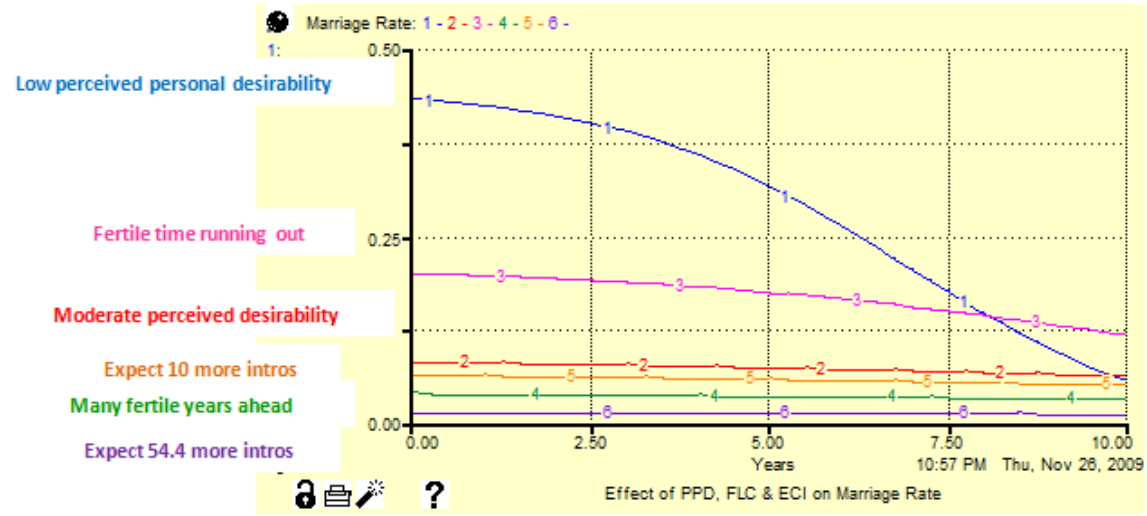


Figure 3: Comparing the effects of PPD, FLI and ECI on the Marriage Rate

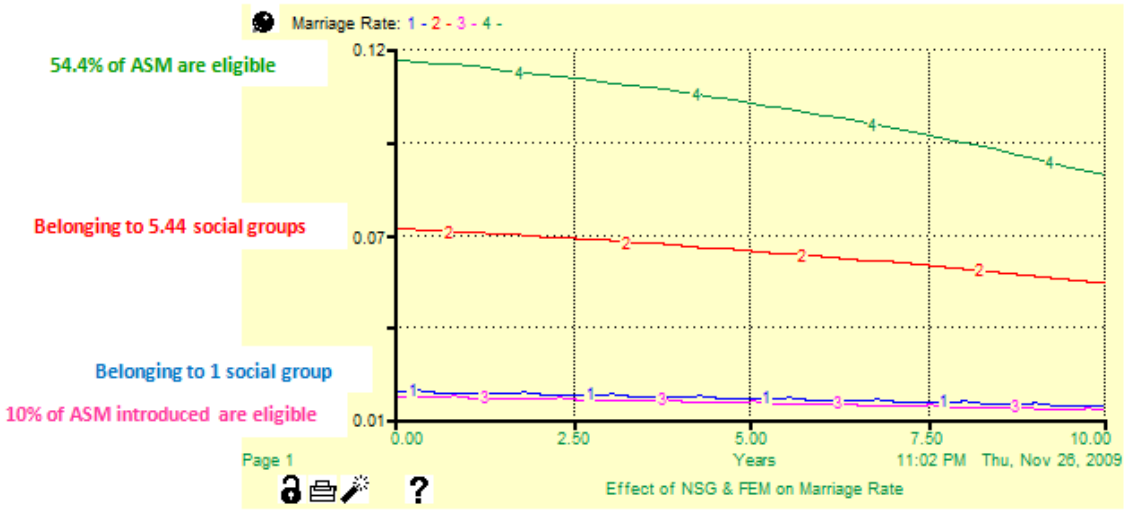


Figure 4: Comparing the effects of NSG & FEM on the Marriage Rate

6. SUMMARY OF RESULTS

The System Dynamics modeling of the journey from Singlehood to Marriage reveals interesting insights and counter-intuitive findings. The results are presented in Table 3 and 4 below.

6.1 RELATIVE IMPACT OF VARIABLES ON NUMBER OF MARRIED FEMALES

The results shown in Table 3 reveal that of the factors that decrease the number of Ever Married Females, FLC has the greatest impact, followed closely by PPD and ELC. The significant degree of impact generated by these variables means that these are strong motivating factors for SF to either postpone or commit to selecting a life partner from the mutually eligible males available to her.

This suggests that younger SF, as well as those who regard themselves as more attractive to the opposite sex are significantly more likely to delay marriage decisions. Those who expect to meet many eligible men while in their current cohort would also postpone committing to any of those they have already met.

While belonging to more social groups renders SF more likely to get married, the fraction of eligible males among the single and available men in these groups has almost *double* the impact on pairing off.

With a 444% increase in	Change in the No of Ever Married Females	Percentage of Female Population[11]
Fertility Lifespan Category (FLC)	127784 (decrease)	51.5%
Perceived Desirability (PPD)	109015 (decrease)	43.9%
Expected Cohort Introductions (ELC)	77409 (decrease)	31.2%
Fraction of Eligible males among ASM Introduced	108704 (increase)	43.8%
No of Social Groups	63230 (increase)	25.5%

Table 3: Relative Sensitivity of Each of the 5 Variables in Influencing the Number of EMF

6.2 IMPACT OF VARIABLES ON FRACTION OF MARRIED FEMALES & MARRIAGE RATE

It can be seen from Table 4 overleaf that the highest fractions of EMF (0.78 and 0.92 respectively) and correspondingly higher marriage rates (0.20 and 0.43 respectively) can be attained with the following profiles of SF:

- Those in the older age cohorts (30 to 39 and 40 to 49).
- Those who regard themselves as being less desirable to males with whom they have mutual eligibility.[8]

In addition, if slightly more than half of the available single males introduced to SF are eligible, the fraction of EMF in the total female population would be high – at 0.60, with a correspondingly high marriage rate at 0.11. (Note: the marriage rate of SF 20-29 was 0.065 in 2012, and 0.07 in 2008)

Variables used in Sensitivity Analysis (Applicable to all SF in the Cohort)		No of EMF	Fraction of EMF[12]	Marriage Rate
FLC Fertility Lifespan Category	1 *Median of 4.5 fertile years left*	194091	**0.78**	**0.20**
	5.22 *Median of 24.5 fertile years left*	66307	0.27	0.04
PPD Perceived Personal Desirability	0.1 *Perceive themselves as desirable to only 10% of males with whom they have mutual eligibility*	229157	**0.92**	**0.43**
	0.544 *Perceive themselves as desirable to only 52.2% of males with whom they have mutual eligibility*	120142	0.48	0.08
ECI Expectations of Cohort Introductions to Eligible Males	0.1 *Expect to meet 10 more males with whom they have mutual eligibility while in the cohort*	100492	0.4	0.06
	0.019 *Expect to meet 54.4 more eligible males while in the cohort*	23083	**0.093**	**0.01**
NSG No of Social Groups	1 *Belong to 1 social group*	42430	0.17	0.02
	5.44 *Belong to 5.44 social groups*	105660	0.43	0.07
FEM Fraction of EM among ASM Introduced	0.1 *There is mutual eligibility with 10% of the available single males introduced to them*	40098	0.16	0.02
	0.544 *There is mutual eligibility with 54.4% of the available single males introduced to them*	148802	**0.60**	**0.11**

Table 4: Comparison of the Effects of Specific Values of each of the 5 Variables on (1) the Number & Fraction of EMF and (2) the Marriage Rate

7. ANALYSIS OF RESULTS & RECOMMENDATIONS

7.1 Higher Chances of Match-making Success with Older SF

The results suggest that, all things being equal (i.e., with the rest of the assigned data in the model being unchanged), the chances of success with SF in the 30 to 39 and 40 to 49 age cohorts are substantially and progressively (with advancement in age) higher than those with younger cohorts. This is *counter-intuitive*, as there is a strong tendency for private matching-making agencies and even government marriage promotion units to neglect these age groups (especially those nearing and above 40) as they consider their chances of success to be very low.

Moreover, private match-making agencies are profit-driven, and would concentrate their resources on younger clients. These clients would be easier to find dating partners for, and this would generate revenue with clients of the opposite sex. Younger clients are also likely to use their services for a longer time in their search for better matches, as they have time on their side. Likewise, government agencies, driven by the need for output figures and success rates as indicators of their performance, would be motivated to reach for the low-hanging fruit – young single females whose marriage and child-bearing would help lift the country's low fertility rate.

The results indicate, however, that *stepping up efforts to help this group of SF overcome the challenges in their search of a life partner will pay off handsomely*. Such efforts could include connecting them with dating / social groups that more closely match their age, economic status and interests, and ensuring that these groups have a high fraction of single eligible males open to marrying someone in this age group.

7.2 Low Perceived Personal Desirability Raise Chances of SF Committing to Marriage

The finding that low perceived personal desirability makes SF more likely to commit to marriage (instead of waiting for someone better) has interesting implications for the way match-making programmes are designed.

One possible inference is that *group-dating may be more effective than one-to-one dating* as the presence of other single and available females may have the effect of lowering an SF's assessment of her chances of being picked from among many, and thus raise her willingness to commit when she does find someone mutually eligible (not necessarily at this group-date event). Thus, a possible approach could be to promote more group-dating activities by making them more accessible (through lower cost, perhaps) and more appealing (through thoughtful, sensitive and creative programme design).

7.3 Better Profile-Matching Amplify Chances of Match-making Success

From the findings, it is clear that a critical feature of such groups is that the higher the fraction of eligible males there are among those introduced, the higher the chances of marriage taking place.

This suggests that matching-making agencies would do well to *focus on interests, beliefs and values in programme planning to pool singles with similar profiles together*. Group-dating activities could be organized around special interests such as pet-care, photography, an environmental cause, animal protection, bowling, golfing, dancing lessons, camp-craft, and recycling efforts. In planning for group dating activities, *allowing time flexibility in leaving and joining such groups would have the effect of increasing the number of introductions* (those that go beyond the cursory and superficial ones) to available single males in the group over time.

7.4 Ample Supply & Consumption of Match-making Services is Counter-productive

Another important finding that can be gleaned from the table is that the number of mutually eligible males that SFs *expect to be introduced to* has an enormous impact on

life partner selection. Both the EMF fraction and the marriage rate are very low at 0.093 and 0.01 when the number of expected introductions is 54.4, for instance. Such expectations of introductions are influenced by the one's own social life (the frequency of interactions with new people) and the membership flows and ebbs of the social groups (those outside of match-making agencies) that one is in. For those who have joined match-making agencies, the line-up of activities offered, the cost of participation, the nature of promotional packages, and one's expected extent of participation combine to influence the ECI.

This has important implications for matching-making agencies. Possible applications of the results from the model would be to:

- Avoid offering "cheaper if you buy more" promotions. In this context, to match-making agencies, "pay less for more introductions" deals may bring in funds to cover running costs, but such a move would delay marriage decisions. Such delays would last as long as the lifespan of the package, so if the deal is that the 20 introductions could be used within 18 months, the delay would last as long. This finding is counter-intuitive. Agencies may think they are supporting the nation's policy of promoting marriage and lowering the median age of marriage through such promotions but the effect would be just the opposite!
- As the number of introductions a SF can get from various match-making agencies is practically unlimited, accessibility is a lever that can be used to limit her expectations of introductions. Accessibility could be controlled through pricing. Naturally, the goal is not to restrict SF from meeting eligible males, but to limit her expectations of introductions. The pricing should therefore be carefully calibrated: it should be high enough to prevent over-consumption of services and yet be "value-for-money" through effective profile-matching to ensure a high FEM (Fraction of Eligible Males). Discounted pricing for subsequent purchases of packages ("buy this package and get the next one at half price") should be avoided, as this would encourage delays in committing to marriage with someone whom the SF has already met and found mutually eligible.

- Besides pricing, other barriers such as criteria for participation in activities could be erected. SF of a younger cohort could be kept out of groups meant for older SF. This would not only reduce expectations of introductions; it would address the problem of older SF being left out of the marriage market due to the phenomena of single men marrying down (females of same age or younger; of same economic status or lower) and SF marrying up (males of same age or older; of same economic status or higher), while it is much less socially acceptable for SF to marry down (younger males; of lower economic status) and SM marrying up (older females; of higher economic status)

7.5 Developing a Holistic, Society-based Approach is the Best Way Forward

The findings indicate that belonging to more social groups with a high proportion of eligible males boosts marriage rates for SF. This implies that investing more resources in engaging the help of external parties such as both public and private sector employers, community and religious bodies, educational institutions, professional associations and others to create group participation opportunities for singles with common interests, passions, beliefs and values can do much more for the marriage rate than relying predominantly on private dating agencies.

8. CONCLUDING REMARKS

This exploration of the dating and mate-selection process has an important end-goal: to boost Singapore's fertility rate by lessening marriage delays and involuntary singlehood. The fact that this quest is shared by many Asian countries plagued with these marriage trends and declining populations underscores the relevance and importance of such an investigation. There are many exciting possibilities for further exploration into singlehood, marriage and birth using the tool of System Dynamics modeling. Examples of such investigations include the dynamics of other marriage contexts (e.g. marriage between citizens and foreigners), marriage dynamics for smaller population groups (e.g. females of minority groups, such as the Malay community and Indian females in Singapore), the dynamics of birth, family size and community support systems, and the effect of societal and economic factors on these policy situations.

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[1] Total fertility rate refers to the average number of live-births each female would have during her reproductive years if she were to experience the age-specific fertility rates prevailing during the period.

[2] Singapore's life expectancy increased by 10 years over the last 3 decades: from 72 years in 1980 to 82 years in 2010. (Source: Our Population Our Future, Issues Paper July 2012, National Population and Talent Division, Prime Minister's Office, Singapore)

[3] However, in the context of dating, we do not include families as social groups.

[4] Here, we distinguish between eligibility and desirability: An eligible SF eligible may not necessarily be desirable to an EM.

[5] Not inclusive of 0, as the reciprocal of 0, which is used in the model equation, would have an indefinite value.

[6] Depending on cultural and social norms and values, the average PPD for older age cohorts may be higher or lower.

[7] Marriage statistics stop at 40 to 49 cohort, ostensibly due to the insignificant occurrence of marriage in older cohorts.

[8] It should be noted that these 2 characteristics of age and perceived desirability could well be linked, but we should not presume that they necessarily go together. A successful and attractive SF in her forties may regard herself as a good catch, and may have a PPD of 0.6, for instance.