

Interethnic friendships under ethnically segregated education pathways in Malaysia

Abstract

Ethnic homophily in plural societies leads to ethnic segregation and the perpetuation of social inequalities. The Contact Hypothesis posits that intergroup contact can reduce prejudice and improve interethnic relations. This paper examines how intergroup contact in national schools and the lack thereof in ethnically homogenous schools affects the extent of homophily in the friendship networks of Malaysian university students. Malaysia offers a unique context to study interethnic relations in a plural society due to ethnic segregation in education pathways. Utilising moderation analysis of the ethnic homophily terms in an egocentric exponential random graph model (ERGM), I find evidence that attending national secondary schools, is associated with lower levels of ethnic homophily. On the other hand, attending ethnically homogenous schools do not amplify homophilic tendencies. These findings suggest that friendship formation at university is affected by experiences in both primary and secondary school, implying that contact effects are enduring.

Keywords: Ethnic Homophily, Contact Hypothesis, Social Network Analysis, University Friendship Networks, Egocentric Exponential Random Graph Models

I. Introduction

Social networks are characterised by homophily, where individuals tend to associate with others who share similar attributes (McPherson et al., 2001). This seemingly harmless natural inclination poses a threat to social cohesion in plural societies where different ethnic groups coexist within a single political entity (Smith, 1971). A preference for same-ethnic social ties at the individual level may produce ethnic segregation at the societal level, and social inequalities emerge when economic opportunities and resources are consolidated within groups (DiMaggio & Garip, 2012). Then, intergroup tension and conflict may arise as groups contend for control over economic resources and political power (Hoetink, 2011). Therefore, mediating interethnic relations is a key priority for policymakers in plural societies.

In the case of peninsular Malaysia, the division of the economy along ethnic lines during the colonial period has resulted in economic disparities between ethnic groups even after independence (Abraham, 1983). Ethnic struggle came to define the first decade of independence, with riots breaking out in 1969. The event is attributed to inequalities among ethnic groups stemming from the ethnic division of labour which resulted in Malays being underrepresented in the administrative, managerial, and professional occupations and recording the highest incidence of poverty (Lee, 2021). In the aftermath, a series of affirmation action policies which encompasses economics, land ownership, education, and other facets of society were implemented under the New Economic Policy (NEP) to uplift the economic status of Malays.

Table 1: Ethnic Groups in Malaysia

Ethnic Group	Number	Percent
Malay	18 million	58%
Chinese	7 million	23%
Indian	2 million	7%
Others	4 million	12%
Source: Department of Statistics Malaysia (2024)		
Note: The “Others” category includes indigenous tribes, East Malaysian ethnicities, and other ethnicities.		

One of the educational goals of the NEP is to increase the proportion of Bumiputera students in tertiary education. This inadvertently led to ethnic segregation in higher education. Lee (2012) estimates that 55 percent of university places were allocated to Bumiputera students for a period of 30 years from the implementation of the NEP. Over the same period, demand for higher educated workers rose in the quickly industrialising Malaysia. The limited slots at public universities for Chinese and Indian students mean that they had to attend private universities to obtain tertiary education. Lee (2017) argues that enrolment quotas facilitated the displacement of non-Bumiputera students from public universities. Despite the overarching NEP objective to foster national unity, ethnic segregation between public and private universities emerged as Bumiputera students tend to attend public universities while non-Bumiputera students attend private universities.

Ethnic segregation is also present in the primary and secondary education system in Malaysia, with different education pathways for each ethnic groups as each tend to choose a distinct type of primary and secondary school to attend. At the primary level, there are Chinese and Tamil vernacular primary schools in addition to national primary schools, and the medium of instruction in these schools are Mandarin and Tamil respectively. Raman & Tan (2010) find that almost all Chinese parents prefer to send their children to vernacular school, and for Indian parents that figure exceeds half. In 2024, pupils in Sekolah Kebangsaan (SK) are predominantly Bumiputera, while pupils in vernacular schools remain predominantly ethnic Chinese or Indian (see Table 2). There are also religious schools or Islamic primary schools that cater to the needs of the majority Muslim Malay community. Furthermore, Chinese Independent Schools (CIS) provide secondary education in the Chinese language and utilise a curriculum which incorporates Chinese cultural values. Additionally, several Bumiputera exclusive secondary schools are established following the implementation of the NEP.

Table 2: Ethnic Composition of Schools in Malaysia

	Bumiputera	Non-Bumiputera
Sekolah Kebangsaan (SK)		
2014	94%	6%
2024	95%	5%
Sekolah Jenis Kebangsaan Cina (SJKC)		
2014	12%	88%
2024	19%	81%
Sekolah Jenis Kebangsaan Tamil (SJKT)		
2014	0.4%	99%
2024	0.5%	99%
Sekolah Menengah Kebangsaan (SMK)		
2011	72%	28%
Sekolah Menengah Kebangsaan Agama (SMKA)		
2011	100%	0%

Source: Oral answer to Question 35 from the 2nd Session of the 3rd Term of the 15th Parliament (9 July 2024); Malaysia Education Blueprint 2013 – 2025.

Note: Statistics on ethnic composition of schools are presented where available. The term Bumiputera (translated as “sons of the soil”) refers to ethnic Malays and other indigenous populations in Malaysia whose special position is recognised in the Malaysian Federal Constitution.

Ethnic segregation in the primary and secondary education system produces the pattern of ethnically homogenous schools in Malaysia through two distinct mechanisms – the first based on pupil/parent preference and the second based on admissions quota. Vernacular schools and religious schools become ethnically homogenous when pupils of a particular ethnic group self-select into these schools due to their preference for education that incorporates elements of a particular language, culture, or religion. On the other hand, Bumiputera exclusive schools become ethnically homogenous through admissions quota. For example, Maktab Sains Rendah MARA (MRSM) implements a 90 percent Bumiputera enrolment quota where only 10 percent of spots are offered to non-Bumiputera pupils.

There may be potential “lack of contact” effects in ethnically homogenous schools where opportunities for meaningful intergroup contact are limited. When pupils from different ethnic backgrounds are systematically separated into distinct schools, interactions with peers from other ethnic groups become constrained. This separation can reinforce existing homophilic tendencies, and the lack of interethnic interactions can perpetuate biases and stereotypes, which hinder the development of intercultural understanding. The amplification of ethnic homophily in segregated educational settings may hinder the positive intergroup relations and contribute to the persistence of social and cultural divisions.

However, there are still opportunities to foster social cohesion in Malaysia through national school. Despite the plethora of options for secondary education (see Table 3), Sekolah Menengah Kebangsaan (SMK) remains the most common choice for Malaysian pupils due to its affordability and availability in all states of peninsular Malaysia. According to the Malaysia Education Blueprint 2013 – 2025, 88 percent of secondary school students enrolled in SMK in 2011. In Malaysia, SMK best fits the function of a national school since it has a greater level of ethnic diversity than the other school types, offering students with opportunities to interact with students of other ethnicities. Interethnic contact under favourable conditions can reduce prejudice and encourage positive perceptions of out-groups (Allport, 1958).

This paper examines both the contact effects of attending SMK and the potential “lack of contact” effects in ethnically homogenous schools. I leverage the unique education landscape in Malaysia where there is a plethora of options for both primary and secondary education to investigate the relationship between education pathway and the ethnic diversity of university friendship network. Specifically, I explore how schooling affects ethnic homophily by testing two hypotheses: (1) Students who attended SMK, which have greater ethnic diversity, are more likely to have a diverse friendship

group at university. In other words, attending national school is expected to decrease the level of ethnic homophily. (2) Students who attended schools that are less diverse are less likely to have a diverse friendship group at university, which means they would exhibit greater levels of ethnic homophily. I rely on the assumption that an individual's schooling experience affects friendship formation patterns at university. This assumption is likely to hold because schools are avenues where youths are socialised into their ethnic cultures (Collins & Annett, 1975), and the effects of socialisation are likely most prominent upon finishing school, coincidentally when students transition into university.

Table 3: Typography of Malaysian Primary and Secondary Education Landscape

Primary Schools	
Sekolah Kebangsaan (SK)	Translated as “National Schools,” these are national primary schools. There is a total of 5,948 such schools throughout Malaysia, which is one school for roughly 1,345 households.
Sekolah Kebangsaan Jenis Cina (SJKC)	These are Chinese vernacular primary schools, where Mandarin is taught in addition to English and Malay. Science and mathematics are taught in Mandarin and English. There is a total of 1,305 SJKCs in Malaysia.
Sekolah Kebangsaan Jenis Tamil (SJKT)	These are Tamil vernacular primary schools, where the Tamil language is taught in addition to English and Malay. Science and mathematics are taught in English and the Tamil language. There is a total of 528 SJKTs in Malaysia.
Sekolah Agama	Translated as “Religious Schools,” these are schools that incorporate Islamic teachings in the curriculum. They are established and administered by state religious authorities rather than the Ministry of Education. At the primary level, these schools run parallel to the national school system, and many Muslims attend national school in the morning and Sekolah Agama in the afternoons or evenings. There are 4637 such schools throughout Malaysia according to the Islamic Education Information Portal (Portal Maklumat Pendidikan Islam).
Secondary Schools	
Sekolah Menengah Kebangsaan (SMK)	Translated as “National Secondary School,” these are the national schools where most Malaysians attend for secondary education. There are 1,989 SMKs throughout Malaysia.
Chinese Independent School (CIS)	These are secondary schools that use Mandarin as the medium of language. They do not receive fundings from the Malaysian government and are self-funded or sustained by donations by the Chinese community (Siah et al., 2015). Many were established by Chinese migrants during the 19 th and 20 th centuries. There is a total of 60 CIS in 2020.
Sekolah Menengah Kebangsaan Agama (SMKA)	Translated as “Religious Secondary School,” these are established and administered by state religious authorities rather than the Ministry of Education, like Islamic schools at the primary level. There are 61 SMKAs in Malaysia in 2023.
Maktab Rendah Sains MARA (MRSM)	Translated as “MARA Science Junior College,” these are special boarding schools managed by Majlis Amanah Rakyat (MRSM, or translated as “People’s Trust Council”), which is a government agency formed for the purposes of Bumiputera empowerment. MRSM implements a 90 percent Bumiputera enrolment quota, and its aim is to accelerate the acquisition of science and technology subjects among the Bumiputera population. There are 57 MRSMs in Malaysia in 2024.
Sekolah Berasrama Penuh (SBP)	Translated as “Full Boarding Schools,” these are selective secondary schools modelled after British boarding schools. SBPs were established through the Second Malaysia Plan (1975 - 1980) with the aim of providing quality science and technology education to Malaysian pupils with high potential. There are 69 SBPs in Malaysia in 2024.

II. Intergroup Contact and Schools

Allport (1958) argues that contact between different social groups under favourable conditions leads to reduced prejudice and increased acceptance of out-group members. A large body of empirical evidence support this “Contact Hypothesis” (see Pettigrew & Tropp, 2006, and Paluck, Green & Green, 2019, for a review), as Allport’s idea came to be known. Studies focus on the effect of a “contact intervention,” ranging from brief, controlled interactions to unscripted engagements over a longer period, on outcomes, including self-reported or socially evaluated levels of attitudes towards the out-group and behavioural outcomes such as observed interactions and friendships among members of different social groups. The evidence, taken collectively, suggest that intentional efforts in encouraging direct contact and shared activities between groups can lead to improved relations. In the past, the interventions examined typically involve contact spanning less than a year where outcomes are measured immediately after the intervention in artificial laboratory settings (McKeown & Dixon, 2017). This paper adds to the growing body of literature examining contact effects in a real world context as opposed to laboratory experiments (Boisjoly et al., 2006; Christ et al., 2014; Schwab et al., 2019).

This paper focuses on intergroup contact through schools (Thijs & Verkuyten, 2014; Merlino, Steinhardt & Wren-Lewis, 2019; Burgess & Platt, 2021). Schools have high potential to affect one’s perception towards out-group members over a prolonged period, given that mandatory education of at least seven to twelve years is implemented in most countries. In plural societies like Malaysia, national schools provide a unique point of convergence in the life journeys of individuals from various backgrounds (Selvadurai et al., 2015). They offer unique opportunities for studying sustained contact between different groups in an ethnically diverse social environment, which has been found to be associated with an increase in the formation of interethnic friendships and an increase in the ethnic diversity of friendships (Kokkonen et al., 2015). Furthermore, national schools are mediums for instilling mutual understanding among ethnic groups, which potentially affect the long-term preferences and perceptions of individuals. Studying the individuals who attended public schools in plural societies allows investigation into the durability of the contact effect.

III. Methods

Data Collection

I answer the research questions by utilising information on schooling background and friendships of 203 Malaysian university students collected through a self-administered survey using Network Canvas, a digital social network survey tool (Birkett et al., 2021). The survey collected information on the respondents and their friends (see Appendix 1). The resulting set of personal network data, or egocentric network data, allows me to explore how attributes of each respondent, such as their reported ethnicity and education pathway, affect the composition of their friendship network.

To the best of my knowledge, this is the first large-scale collection of the friendship network data of Malaysian university students. Due to the absence of publicly available datasets on friendship networks in Malaysia, previous studies have also relied on self-administered surveys to study interethnic friendships (Yeoh, 2006; Tey et al., 2009). The previous study focused only on Economics students at Universiti Malaya (UM), Malaysia’s premier public university. To capture more variation in the education pathways, I utilised a broader sampling scope which includes two public universities, namely UM and Univesiti Kebangsaan Malaysia (UKM, translated as “National University of Malaysia”), and three private universities. The inclusion of private universities allowed for a wider variety of education pathways in the sample since most students in public universities must have attended national secondary school to be eligible to enter public universities. Including private universities also allowed higher variation in ethnicities, since Chinese and Indian Malaysians are more likely to attend private universities (Lee, 2017).

The survey contained three sections. The first section of the survey is the name generator stage. Respondents were presented with a series of fifteen prompts to aid them in recalling the names of their friends and entered their names in the digital survey (see Appendix 2). Since friendship network data

was collected by allowing respondents to self-report a list of friends, there could be variations in how different individuals perceive friendship. To overcome this challenge, I deconstructed the notion of friendship into distinct prompts based on functional specificity, or by the functional roles that social connections often possess (Cutrona & Russell, 1990). The fifteen prompts in the survey were constructed based on situation-specific queries, with questions from four categories: work, personal life, leisure, and social support. These situation-specific prompts aligned with the part-whole hierarchical structure of friendships (Munck, 2020).

The second section is the name interpreter stage, which collected further information on each friend that the respondent nominated. I asked the respondent about the gender and ethnicity of each friend, as well as how close the friend was to the respondent. The first two attributes were elicited from the point of view of the respondent, which might not necessarily correspond to the actual gender or ethnicity of the named friend. For example, a respondent might think that a friend identified as Malay when in reality the friend identified as another ethnicity. The likelihood of misclassification was low due to the saliency of ethnic classifications in the Malaysian context. The presence of misclassification is also inconsequential to the research design since inferences are made on each respondent's friendship formation patterns, which are influenced by each respondent's perception of their friends' attributes, rather than the actual attributes of their friends.

The third and final section gathered information about the respondent, including their ethnicity, primary and secondary school type, university institution, gender, and year of birth (see Appendix 3). The question on ethnicity included options for the three main ethnicities in peninsular Malaysia – Malay, Chinese, and Indian – and three additional options: East Malaysian, Mixed, or Other.

Respondents were sampled using a non-probabilistic, quota-based sampling method. Before data collection commenced, I had targeted to have 200 students in my sample, with half from public universities and half from private universities. Respondents must have been enrolled in the university for more than a year to enter the survey. I focus on these students as they were more likely to have a crystallised friendship network. I also aimed for representation from all three major Malaysian ethnic groups and gender balance in the sample.

During the data collection period, I approached students at random around a few identified hotspots at the university campuses where students were likely to spend their free time, such as discussion spaces, the cafeteria, and study spaces around walkways. Students entered the survey after expressing interest and agreeing to a consent form. I left the respondent to complete the survey on their own by following the instructions on the screen, while I made myself available in case the respondents have any questions. This was to minimise the risk of social desirability bias by eliminating a present interviewer during the survey administration (Kreuter et al., 2008).

I provided monetary compensation of RM10 to respondents upon completing the survey to minimise the risk of satisficing, which is a data quality risk when respondents exert minimal effort to provide accurate or thoughtful responses. The task required of respondents, to introspect and recall names from their network of friends in response to open-ended prompts, was one that is cognitively taxing (McCarty et al., 2001), and satisficing might occur when the utility from exerting cognitive is low (Matzat & Snijders, 2010). Thus, I used monetary compensation to encourage maximum participation from respondents. Additionally, I strategically placed the name generator phase, which requires the most cognitive effect, in the first section of the survey.

Social Network Analysis

This paper approaches ethnic homophily in a way that deviates from the conventional framework of distinguishing between baseline and inbreeding homophily (McPherson et al., 2001). Baseline homophily simply homophily based on the chance of meeting diverse groups in the network and is obtained from a network model of random assortment. This network model is then used as a baseline to which an observed network is compared to. The difference between the two is inbreeding

homophily. This homophily can be interpreted as a preference for similar individuals that causes them to associate more often than expected given their relative numbers in the pool of possible relationships (Marsden, 1988). Calculating baseline and inbreeding homophily requires complete network data and knowledge of the proportions of the constituent groups in the network.

In contrast, this paper approaches homophily from an individual-centric perspective. Homophily is conceptualised as the inclination of an individual to form friendships with others of the same ethnicity. An increased likelihood of forming friendships with those sharing the same ethnicity indicates higher levels of ethnic homophily, while a decrease in the likelihood of forming friendships with those of the same ethnicity indicates lower levels of ethnic homophily. This way of conceptualisation allows researchers to measure homophily using egocentric network data, which are collections of individual networks.

Sampling egocentric network data offers several advantages over complete networks. Firstly, it is significantly less costly to implement as complete networks require interviewing all members of the selected social setting to capture relationships between all the members. Secondly, it mitigates concerns over the protection of the anonymity of individuals involved in the study as individuals in a complete network are more likely to be identifiable. Finally, probabilistic sampling methods can be incorporated into egocentric sampling of network data, which ensures that the relevant groups of interest are adequately sampled (Perry et al., 2018).

Each individual network in egocentric network data can be thought of as a single complete network, for which a measure of ethnic homophily can be obtained. The hypotheses of this paper can then be operationalised as I explore how individual attributes are associated with the level of homophily of each individual network. An individual exhibiting a higher likelihood of forming friendships within the same ethnicity is inherently prone to cultivating a larger circle of same-ethnicity friends.

I utilise a statistical method in social network analysis called an exponential random graph model (ERGM) to perform statistical hypothesis testing. An ERGM models the probability of observing a particular network as a function of a vector of network statistics (Hunter et al., 2008). While ERGMs are originally used to model complete networks, Krivitsky & Morris (2017) developed a suite of statistical tools that allow ERGMs to be implemented using egocentric network data. A simplified way of expressing an ERGM is:

$$\Pr(Y = y) = \frac{\exp(\theta^T \delta(x, y))}{c(\theta)} \quad (Eq. 1)$$

where $\delta(x, y)$ is a mapping function that computes sufficient statistics encompassing the change in the probability of observing the network in response to the change in an exogenous attribute, x , of a network actor while leaving the rest of the network unchanged. θ^T is the coefficient of the network statistic, and $c(\theta)$ is a normalising constant to ensure that probabilities range between the values zero and one.

The ERGM estimates the key network statistic of interest – ethnic homophily, which can be interpreted as the increase in the log odds of observing the given network in response to two actors being of the same ethnicity as opposed to being of different ethnicities, holding on the rest of the network fixed. To answer the hypotheses of this paper, I conduct moderation analysis of the estimate of ethnic homophily from the ERGM. In other words, I estimate the change in the ethnic homophily ERGM term in response to a change in another network attribute, such as the type of school the individual attended for primary or secondary education.

Moderation analysis must be conducted after interpreting the network statistics in terms of their average marginal effects (AME) to overcome the problem of scaling in nonlinear probability models (Duxbury, 2023). Interaction terms of ERGM terms with network attributes are biased because ERGM estimates are denominated in log scale while changes in moderating variables are often in levels. Although coefficients are biased due the problem of scaling, predictions from ERGM are unaffected.

This property enables moderation analysis by interpreting ERGM coefficients in terms of marginal effects.

The marginal effect can be calculated at each dyad by taking the partial derivative for the coefficient:

$$\text{Marginal Effect at } i = \theta \frac{\partial p_{ij}}{\partial x} \quad (\text{Eq. 2})$$

This quantity can be interpreted as the probability of observing a tie, p_{ij} , in response to a one-unit increase in network attribute x at observation i . To incorporate information on marginal effects at all observations, Duxbury (2023) recommends averaging over all observations to obtain the AME:

$$AME_x = \theta \frac{1}{n} \sum \frac{dp_{ij}}{dx} \quad (\text{Eq. 3})$$

AME_θ is the average change in p_{ij} in response to a one-unit increase in x .

In my analysis, I estimate the change in the AME, ΔAME , of the ethnic homophily term when a moderating variable is increased by one, or in the case of a binary variable, when the variable is one instead of zero.

$$\Delta AME = AME_x^{g=1} - AME_x^{g=0} \quad (\text{Eq. 4})$$

With x being the ethnic homophily term, $AME_x^{g=1}$ gives the average change in the probability of a tie when two individuals are of the same ethnicity when the moderating variable g is equal to one.

$$AME_x^{g=1} = \theta \frac{1}{n} \sum \frac{dp_{ij}^{g=1}}{dx^{g=1}} \quad (\text{Eq. 5})$$

On the other hand, $AME_x^{g=0}$ is the average change in the probability of a tie when two individuals are of the same ethnicity when the moderating variable g is equal to zero.

$$AME_x^{g=0} = \theta \frac{1}{n} \sum \frac{dp_{ij}^{g=0}}{dx^{g=0}} \quad (\text{Eq. 6})$$

Asymptotic standard errors are obtained with the Taylor linearisation method, also called the delta method (Raykov & Marcoulides, 2004).

Since the hypotheses concern how schooling affects the strength of ethnic homophily, g is a vector of binary variables for each type of school. I perform hypothesis testing on the key variable of interest – the change in AME. The null hypothesis H_0 is that there are no moderation effects, or no change in the AME. In other words, schooling does not change the effect of ethnic homophily. This is tested against the alternative H_1 that attending national schools, which have a diverse mix of ethnicities, negatively moderates the effect of ethnic homophily, and the other alternative H_2 that attending a school that is exclusive to certain ethnicities positively moderates the effect of ethnic homophily.

$$\begin{aligned} H_0: \Delta AME_\theta &= 0 \\ H_1: \Delta AME_\theta &< 0 \\ H_2: \Delta AME_\theta &> 0 \end{aligned}$$

IV. Results

Respondent Descriptive Statistics

After removing duplicate names, the final sample consists of 203 respondents who collectively named a total of 2,182 friends. Table 4 presents summary statistics of respondent characteristics. The figures for ethnicity, university, and gender are affected by the non-probabilistic, quota-based sampling method. Towards the end of my fieldwork at each university, I ensure that I have met the quota for the number of students at each university. I also aim for gender balance and for the distribution of ethnicities in the sample to reflect the demographic distribution of the university. The respondents' year of study and year of birth are also partly influenced by sampling, since I only sample students who have been in university for more than one year, which means that most respondents are in their first year of university, and many are born between 2000 and 2003.

Malays and Chinese, the two largest ethnic groups represented in the sample, have the most distinct education pathways. Most Chinese in the sample go to SJKC for primary school, while most Malays go to SK. For Malays, the typical pathways after SK are going to SMK or going to a Bumiputera exclusive school. For Chinese students who went to SJKC, most proceed to SMK, while the rest go to either international schools or CIS. All these Chinese students then proceeded to attend private universities. Half of the Indians in the sample went to SK, and these students then proceeded to SMK. A significant portion of Indians go to SJKT, and from there proceed to SMK. In the sample, SMK is the converging point for all ethnicities and is the most diverse school type (see Table 5). On the other hand, Vernacular schools and Bumiputera exclusive schools are the least diverse. Malays are overrepresented in SK, which might be because Chinese students attend SJKC and Indian students attend SJKT. Both the "Other" categories for primary and secondary schools are relatively diverse, but they make up a far smaller proportion of the full sample. Sample statistics on the ethnic composition of each school type commensurate broader ethnic composition as presented in Table 2.

A surprising feature of the sample is that a low number of students attended CIS. A few explanations are possible. Since CIS mostly cater to Chinese students who struggle to follow the curriculum in national secondary schools which is taught in the Malay language (Yeoh, 2013), the relatively low number of students in the sample could be due to the fact that these students pursue tertiary education in Chinese-medium universities or went abroad and are therefore not sampled in this study. Another explanation is that the United Examinations Certificate, awarded to students who complete their secondary education at a CIS, is not recognised by public universities in Malaysia, thus Chinese students opt for SMK instead.

One of the key assumptions about education pathways seems to hold in the sample: there is indeed ethnic segregation into different levels of education in the sample. Fig. 1 contains a Sankey diagram that illustrates the one-step education pathways. Ethnicity plays a large role in determining what type of school one goes to for primary education. Most Chinese go to SJKC, most Malays go to SK, and SJKT is exclusively attended by ethnic Indians. At the secondary level, CIS is almost exclusively attended by students who went to SJKC.

Table 4: Sample Summary Statistics

	Count	Percent
Ethnicity		
Malay	66	32.5%
Chinese	79	38.9%
Indian	22	10.8%
Other	36	17.7%
Primary Language Spoken		
English	85	41.9%
Malay	65	32.0%
Chinese	41	20.2%
Tamil	9	4.4%
Other	3	1.5%
Primary School		
Sekolah Kebangsaan (SK)	91	44.8%
Sekolah Jenis Kebangsaan Cina (SJKC)	73	35.9%
Sekolah Jenis Kebangsaan Tamil (SJKT)	8	3.9%
Islamic School	5	2.5%
Other	26	12.8%
Secondary School		
Sekolah Menengah Kebangsaan	111	54.7%
Bumiputera Exclusive Schools	30	14.8%
Chinese Independent School	9	4.4%
Other	53	26.1%
University		
Public	100	49.3%
Private	103	50.7%
Year of Study		
Year 1	24	11.8%
Year 2	82	40.4%
Year 3	81	39.9%
Year 4	14	6.9%
Masters	2	1.0%
Gender		
Female	103	50.7%
Male	100	49.3%
	Median	SD
Birth Year	2001	1.34

Note: The “Other” category for ethnicity includes 21 respondents who selected “Mixed,” 11 respondents who selected “East Malaysian,” and 4 who responded “Other.” The “Other” category for both primary and secondary education includes international schools, private schools, and home-schools. “Bumiputera Exclusive Schools” includes three types of secondary schools which are typically only attended by Malays, namely SBP, MRSB, and SMKA. Universiti Malaya and Universiti Kebangsaan Malaysia are public universities, while Sunway University, Monash University, and the University of Nottingham Malaysia are private.

Table 5: Ethnic Diversity of Education Institutions in the Sample

	Malay	Chinese	Indian	Other
University				
Universiti Malaya	38 (47.5%)	21 (26.3%)	6 (7.5%)	15 (18.8%)
Universiti Kebangsaan Malaysia	12 (60%)	5 (25%)	2 (10.0%)	1 (5.0%)
Monash University	5 (11.6%)	23 (58.1%)	3 (70.0%)	10 (23.3%)
Sunway University	7 (22.6%)	15 (48.4%)	4 (12.9%)	5 (16.1%)
University of Nottingham Malaysia	4 (13.8%)	13 (44.8%)	7 (24.1%)	5 (17.2%)
Primary School				
Sekolah Kebangsaan (SK)	55 (60.4%)	4 (4.4%)	11 (12.1%)	21 (23.1%)
Sekolah Jenis Kebangsaan Cina (SJKC)	1 (1.4%)	67 (91.8%)	0	5 (6.8%)
Sekolah Jenis Kebangsaan Tamil (SJKT)	0	0	8 (100%)	0
Islamic School	5 (100%)	0	0	0
Other	5 (19.2%)	8 (30.8%)	3 (11.5%)	10 (38.5%)
Secondary School				
Sekolah Menengah Kebangsaan (SMK)	28 (25.2%)	44 (39.6%)	17 (15.3%)	22 (19.8%)
Bumiputera Exclusive Schools	27 (90.0%)	0	1 (3.3%)	2 (6.7%)
Chinese Independent School	0	8 (8.9%)	0	1 (1.1%)
Other	11 (20.8%)	27 (50.9%)	4 (7.5%)	11 (20.8%)

Note: Universiti Malaya and Universiti Kebangsaan Malaysia are public universities, while Sunway University, Monash University, and the University of Nottingham Malaysia are private. Percentages are in parentheses.

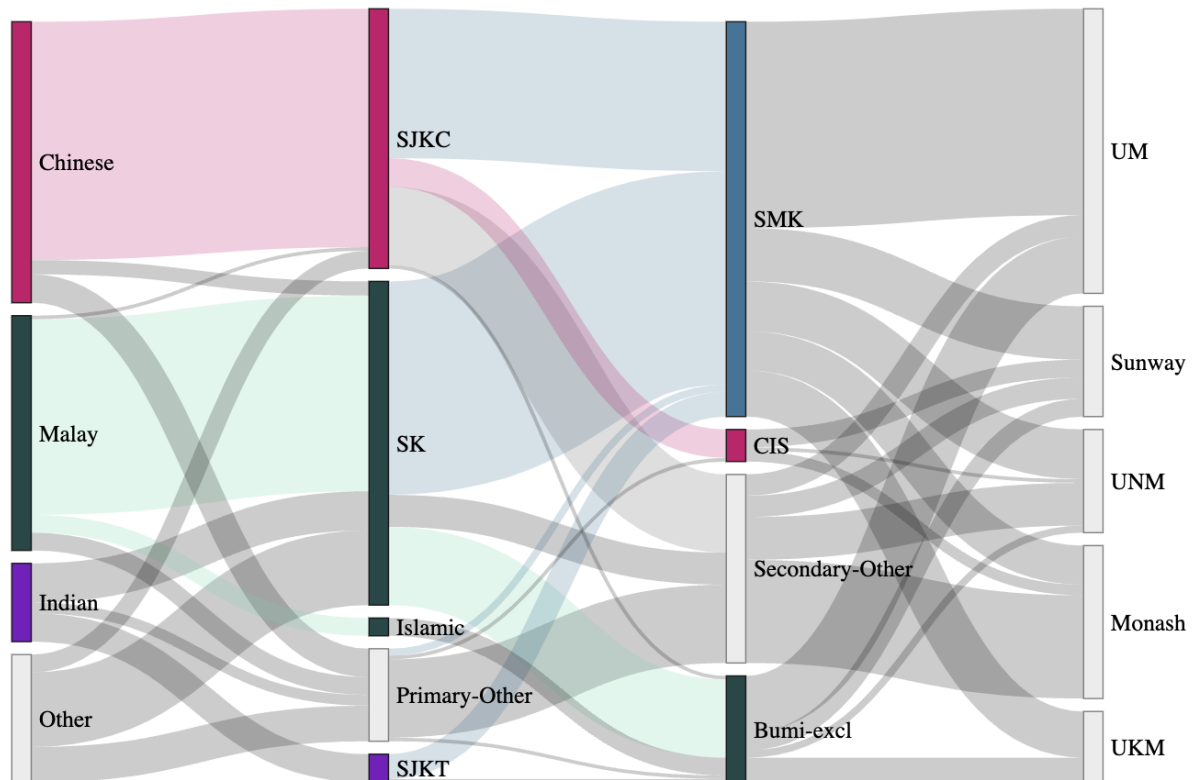


Fig. 1: Sankey Diagram of One-Step Education Pathways by Ethnicity

Note: The education pathways taken by all 203 egos are presented in this Sankey diagram. Nodes in red indicate schools where the majority of students identify as Chinese; nodes in dark green indicate schools where majority of students identify as Malay; and nodes in purple denote schools where majority of students identify as Indian. SMK is coloured in blue.

Network Descriptive Statistics

Moving past respondent characteristics, I present and comment on network descriptive statistics, starting with the degree distribution. The degree of a personal network is the number of friends each respondent nominated. Fig. 2 plots the degree distribution for all 203 egos on a histogram. The degree distribution approximates a normal distribution but is slightly right skewed by outliers who nominated many friends. On average, each respondent nominated 10.8 friends, while the median degree is 9.

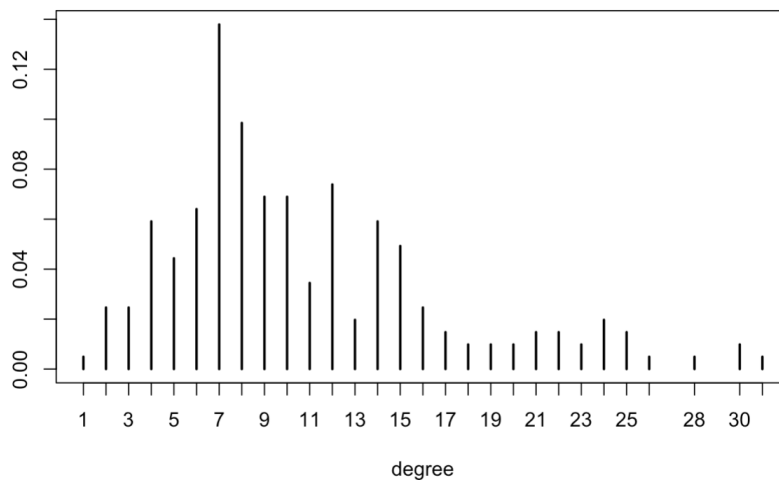


Fig. 2: Degree Distribution of Personal Networks in Sample

Note: The distribution of number of friends reported by each respondent (i.e., the degree distribution) is presented here.

It is possible to construct several measures of homophily for each respondent's personal network. The first such measure is the *EI* index (Krackhardt and Stern, 1988), which is the ratio of the number (*E*) of friends of a different ethnic group from the respondent minus the number (*I*) of friends of the same ethnic group as the respondent to the total number of nominated friends (*E* + *I*):

$$EI = \frac{E - I}{E + I} \quad (Eq. 7)$$

This index measures the diversity a respondent's network between -1 and 1 . A value of -1 indicates perfect homophily, where the respondent only nominates friends of their own ethnic group, while a value of 1 indicates perfect heterophily, where the respondent only nominates friends not from their own ethnic group. A value of 0 indicates an equal number of friends of the same ethnic group and those of a different group.

Fig. 3 plots the distribution of *EI* indices for respondents for each ethnicity. Most Malay and Chinese students have university friendship networks with an *EI* index between -1 and -0.5 , indicating high levels of homophily. Friendship networks of Indian students mostly have an *EI* index of around zero. These patterns of homophily seem to bear a resemblance to findings on baseline homophily in the United States, where larger demographic groups (i.e., Whites in the United States, Malays and Chinese in the sample) have more homogenous networks, while smaller ethnic groups have lower levels of homophily (Marsden, 1987).

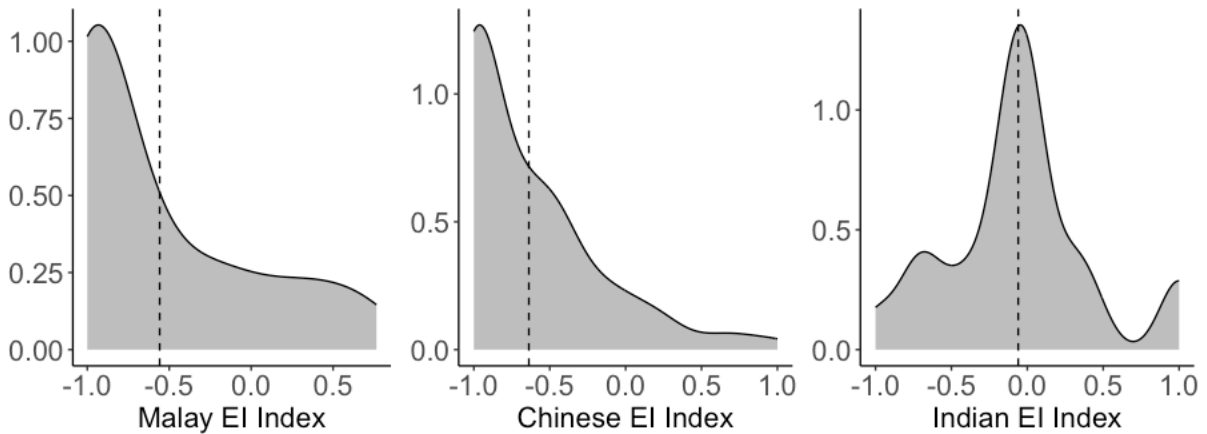


Fig. 3: Distribution of EI Index by Ethnicity

Note: The distribution of EI index values of each ego disaggregated by ethnicity. The dotted line represents the mean for the ethnicity.

Fig. 4 plots a heat map for the proportion of each alter ethnicity among all friends nominated summed across each ego ethnicity. The dark shades on the area denoting Chinese-Chinese and Malay-Malay indicate that more than 80 percent of friends nominated by Chinese or Malay respondents are of the same ethnicity. The fact that the darkest shades of each column are along the diagonal line of the heatmap means that the greatest proportion of friends nominated are of the same ethnic group as the respondent, indicating high prevalence of ethnic homophily among all ethnicities, with mixed ethnicity being the exception.

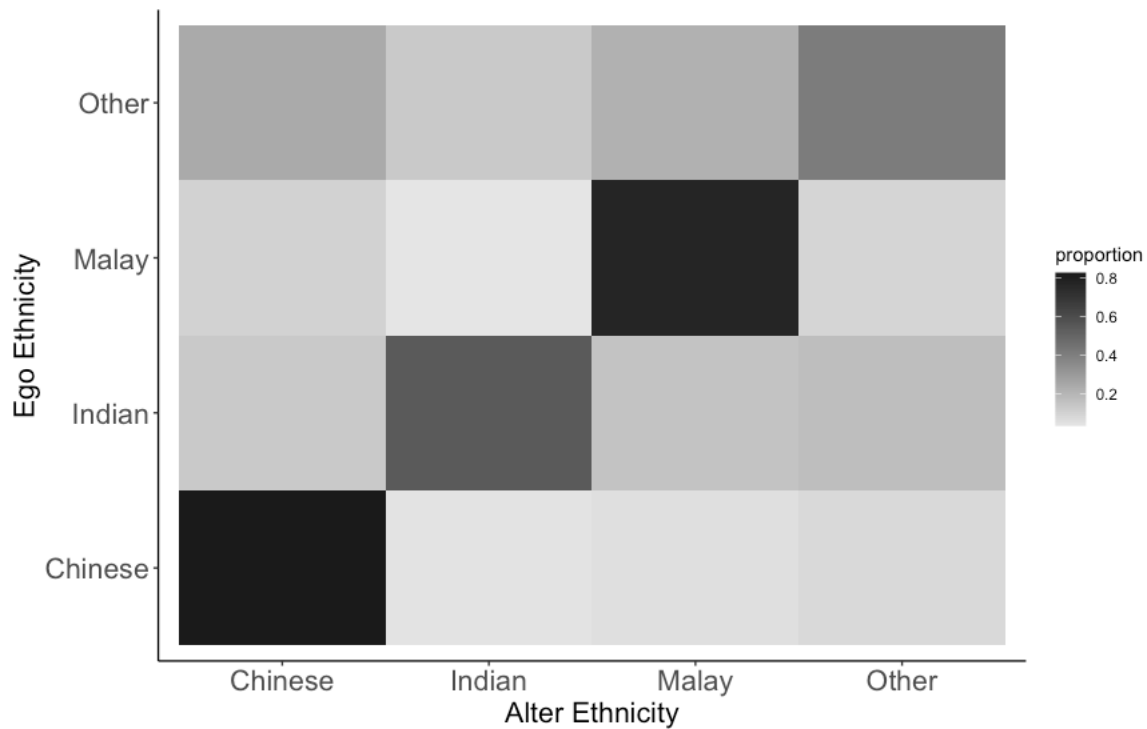


Fig. 4: Proportion of Alter Ethnicity Among All Alters Nominated by Ego Ethnicity

Social Network Analysis Results

Henceforth, I move from describing the data to conducting inferential analysis using social network analysis. To test the key hypotheses of this paper and examine the factors that influence homophily, I utilise moderation analysis on exponential random graph models (ERGMs), which allows me to answer the question of how going to a particular type of school moderates the effect of homophily.

I first run three different egocentric ERGM model specifications. The estimates from each run are comparable with statistically significant ethnic homophily across all ethnic groups, while none of the control variables are statistically significant (see Table 6). The estimates from the egocentric ERGM can be interpreted as follows: holding university and language spoken constant, Ego ERGM 3 predicts that the odds of a friendship tie between two individuals are on average $e^{1.879} = 6.547$ times greater if two individuals are Malay, compared to when one is not Malay. The same interpretation holds for the ethnic homophily term for other ethnicities.

[Table 6 here]

Table 6: Ego ERGM Results

Parameters	Ego ERGM 1	Ego ERGM 2	Ego ERGM 3
Edges	1.556*** (0.103)	1.735*** (0.194)	0.573 (1.454)
Ethnic Homophily			
Malay	1.880*** (0.188)	1.985*** (0.185)	1.879*** (0.264)
Chinese	1.775*** (0.188)	1.718*** (0.183)	1.927*** (0.305)
Indian	2.539*** (0.359)	2.509*** (0.322)	2.372*** (0.488)
Other	2.875*** (0.415)	2.947*** (0.492)	2.879*** (0.457)
Public University (Ref: Private)		-0.191 (0.176)	-0.128 (0.228)
Language (Ref: Other)			
Malay			0.579 (0.786)
Chinese			0.291 (0.749)
Tamil			0.641 (0.957)
English			0.625 (0.738)

Note: Standard errors in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

As the implementation of moderation analysis on egocentric ERGMs is currently not supported, I simulate a complete network using the parameters of the egocentric ERGM and then estimate a regular ERGM on the simulated complete network. Moderation analysis is then performed on the regular ERGM rather than the egocentric ERGM. I simulated a complete network using Ego ERGM 3, which includes controls for both language and university when estimating the parameters for ethnic homophily. The regular ERGM results in

Table 7 are comparable in magnitude to that of Ego ERGM 3, suggesting that the simulated network contains sufficient statistics of the egocentric data (Krivitsky et al., 2011).

[Table 7 here]

Table 7: Results of ERGM based on Simulated Complete Network

Parameter	ERGM Model	AME
Edges	-3.719*** (0.139)	-0.176*** (0.007)
Ethnic Homophily		
Malay	1.865*** (0.107)	0.088*** (0.005)
Chinese	1.828*** (0.118)	0.087*** (0.006)
Indian	2.436*** (0.195)	0.115*** (0.009)
Other	2.813*** (0.23)	0.133*** (0.011)
Primary School (Ref: Other)		
SK	0.143 (0.096)	0.007 (0.005)
SJKC	0.008 (0.091)	0.000 (0.004)
SJKT	0.271 (0.164)	0.013 (0.008)
Islamic	0.039 (0.174)	0.002 (0.008)
Secondary School (Ref: Other)		
SMK	-0.191** (0.064)	-0.009** (0.003)
CIS	0.035 (0.114)	0.002 (0.005)
Bumiputera-excl.	-0.017 (0.088)	-0.001 (0.004)

Note: Standard errors are in parentheses. ERGM is run on simulated network based on Ego ERGM 3. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

The second difference for SMK is negative and statistically significant across all three major ethnicities (see Table 8), which indicates that attending national secondary school is associated with a lower average marginal effect of ethnic homophily between each of the three major ethnicities respectively. In addition, there is also a statistically significant positive moderating effect of attending SK for the ethnic homophily terms for Malays and Chinese, indicating that attending SK is associated with a higher average marginal effect of ethnic homophily between Malay students and between Chinese students. There is no statistically significant positive effect for any of the ethnically homogenous schools including vernacular schools (SJKC and SJKT), religious school, and Bumiputera exclusive schools.

[Table 8 here]

Table 8: Results of Moderation Analysis

Moderating Variable	$AME_x^{g=0}$	$AME_x^{g=1}$	ΔAME_x	N
Main Effect: Malay Ethnic Homophily				
Primary: SK	0.080	0.089	0.009* (0.004)	55
Primary: SJKC	0.088	0.088	0.001 (0.004)	1
Primary: Islamic	0.088	0.091	0.003 (0.008)	5
Secondary: SMK	0.103	0.090	-0.014*** (0.003)	28
Secondary: Bumiputera-excl.	0.089	0.088	-0.001 (0.004)	27
Main Effect: Chinese Ethnic Homophily				
Primary: SK	0.078	0.088	0.009* (0.004)	4
Primary: SJKC	0.086	0.087	0.001 (0.004)	67
Secondary: SMK	0.101	0.087	-0.014*** (0.003)	44
Secondary: CIS	0.086	0.089	0.002 (0.005)	8
Main Effect: Indian Ethnic Homophily				
Primary: SK	0.114	0.127	0.013 (0.008)	11
Primary: SJKT	0.105	0.111	0.007 (0.004)	8
Secondary: SMK	0.135	0.124	-0.011** (0.004)	17
Secondary: Bumiputera-excl.	0.116	0.115	-0.001 (0.004)	1

Only combinations of ethnicity and primary/secondary with $N > 0$ are included. $AME_x^{g=0}$ and $AME_x^{g=1}$ indicate the average marginal effect of the ethnic homophily terms when the moderating variable takes on the values of 0 and 1 respectively. ΔAME_x is the second difference, or the difference between $AME_x^{g=1}$ and $AME_x^{g=0}$, which is the key value of interest since it is interpreted as the moderating effect of each school type. N indicates the respondents of the ethnicity that has attended that school in the sample. Some of the combinations of ethnicity and primary or secondary school are rare in the sample, such as Chinese respondents who went to SK ($N = 4$) and Indian students who attend a Bumiputera exclusive secondary school ($N = 1$), and the results for these combinations should be interpreted with caution. Delta standard errors for second difference are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

V. Discussion

Four key findings emerge from the results.

First, friendships among Malaysian university students are characterised by ethnic homophily. Across all model specifications, a persistent result is that Malaysian university students tend to have friends that are of the same ethnic group as themselves. Being of the same ethnicity is a statistically significant predictor of having a large proportion of friends of a particular ethnicity. Across all ethnic groups, two individuals who share a common ethnicity are statistically significantly more likely to become friends. This implies that ethnicity remains a highly salient attribute shaping social interactions in Malaysia and warrants an inquiry into its causes.

This is unsurprising since almost all aspects of life require the acknowledgement of one's ethnicity: at birth, all individuals are assigned an ethnicity; opening a bank account requires individuals to fill out their ethnicity; applying to public universities requires filling out one's ethnicity. The pervasiveness of ethnicity as a social categorisation influences the social networks of Malaysians. Studies have noted that ethnic homophily characterises the social relationships in Malaysia (Tey, Halimah & Singaravelloo, 2009; Yeoh, 2006). It is this feature of Malaysian society and ethnic segregation across all levels of the education system provides a unique context for studying the dynamics of interethnic friendship formation in plural societies.

Second, the sample shows the choice of which primary education institution to attend is largely influenced by ethnicity, while the choice of secondary education institution is influenced by both primary education and ethnicity. At the primary level, Malays go to SK, Chinese go to SJKC, and Indians go to SJKT. The proportion of students in each educational pathway likens that described in Raman & Tan (2010). This pattern of ethnic segregation in the Malaysian education system provides a unique context to evaluate how primary and secondary schooling is associated with friendship formation patterns later in life, while SMK serves a key point of convergence for students of all three major ethnicities and allows inquiry into the contact effects in a national school.

Third, the results of the moderation analysis indicate support for the hypothesis that students who attend SMK are more likely to have a more diverse friendship network. Attending SMK is associated with lower levels of ethnic homophily at the university level across all ethnicities. This implies that intergroup contact enhances the tendency to have more friends of other ethnic groups. This result is consistent with the predictions of the Contact Hypothesis, and highlights schools as a long-term driver of friendship formation behaviour. I corroborate the results from previous studies that national schools offer an opportunity to foster interethnic understandings (Thijs and Verkuyten, 2014). I find evidence that higher levels of contact with other ethnicities through education is associated with lower levels of ethnic homophily in university friendship networks. The result implies that long-term exposure to contact with other ethnicities can alter the friendship formation patterns of individuals. It also implies that experiences as far back as in primary and secondary school have a lasting effect on friendship formation patterns.

Finally, there is no evidence for a "lack of contact" effect in ethnically homogenous schools. I find that neither vernacular schools, religious schools, nor Bumiputera exclusive schools accentuate ethnic homophily tendencies of students. In other words, students who attended these schools are no more likely to have homogenous friendships at university than students from other schools. The only school type that has a statistically significant effect on university friendships is SMK, and it is found to reduce homophilic tendencies.

This result offers an empirical perspective on the current political debate on vernacular schools and affirmative action in Malaysia. The issue of vernacular school is a source of political controversy in Malaysia. The continued existence of these schools is a result of the desire of ethnic minorities to preserve their language, culture, and heritage; but critics argue that these schools exemplify ethnic

segregation in Malaysian society and are socially divisive in nature (Tan & Santhiram, 2014). One may criticise Bumiputera exclusive schools on the same grounds given ethnic-based admissions requirement. The results of this study suggest that this criticism may be overstated since these schools do not lead to increased homophilic tendencies at university.

There are two key limitations underlying the findings of this paper. They offer potential avenues for future research.

First, the measure of homophily in this paper cannot be distinguished as choice homophily or induced homophily (McPherson & Smith-Lovin, 1987). Policymaker aiming to influence tie-formation behaviour through interethnic contact should be concerned about the former than the latter since choice homophily represents a social psychological preference for in-group friends (Lawrence & Shah, 2020). Measuring choice homophily requires ruling out other possible factors that influence friendship formation, such as closure mechanisms (i.e., becoming friends with a friend of a friend) and the opportunity pool for meeting friends. Low levels of cross-group ties may induce transitive closure between individuals from different groups, affecting the level of homophily in the network (Quinn, *forthcoming*), while a homogenous friendship network may simply be due to the low numbers of certain ethnic groups at a university instead of inherent homophilic preferences. Both cannot be ruled out due to the lack of data on the underlying ethnic proportions of each ethnicity in the universities and the absence of alter-alter ties in the data. These questions could be addressed with complete network data or utilising novel methods to estimate homophily using egocentric network data such as Genkin and Koshinen's (*forthcoming*) estimation of homophily using alter-alter ties. The measure of homophily is also limited by the lack of variation in the ethnicities of friends, as core networks tend to be homogenous (Cornwell, 2009). Typically, a sample of at least 25 friends for each respondent in order to generate stable estimates of network measures such as homophily (McCarty et al., 2007); however, the mean degree in the sample is 10.8.

Second, the relationship between education pathway and homophily established in this study cannot be interpreted causally. Ethnic segregation education pathways and homophily is potentially spurious, where segregation can lead to patterns of homophily and homophily can lead to segregation. Future studies could achieve causal identification by collecting friendship data from individuals at each education stage, measuring homophily at each stage, and using the difference in homophily measure between each stage as the outcome variable. There may be other confounding factors that are not accounted for in this study. For example, the interplay between primary schooling and secondary schooling is unexplored, homophilic tendencies at the primary school may be moderated by experiences in secondary school. Future studies that can disentangle the level of ethnic homophily that are associated with primary and secondary schooling and other confounders such as neighbourhood segregation or segregation within universities would contribute to a more robust understanding of the drivers of the friendship formation.

VI. Conclusion

Ethnic categorisation is rooted in Malaysia's colonial history and remain highly relevant as it has been weaponised in the current political arena (Gabriel, 2015). Progress towards promoting interethnic harmony requires an acknowledgement of these realities rather than ignoring them. A nuanced understanding of the dynamics of friendship formation enables policies to be more effectively designed to promote greater harmony between different social groups. These findings are also relevant to multicultural contexts beyond Malaysia.

Policymakers can utilise the positive effects of intergroup contact to bring together diverse segments of the population and foster harmonious relations among them. In Malaysia, SMK has been effective in promoting diversity within friendship networks later in life because of its diverse student populations which facilitates intergroup contact. However, it is important to note that the benefits of intergroup contact are not exclusive to SMK. The essential elements to replicate are the diversity and sustained positive interaction between different groups, which can be achieved beyond a national school

policy. For example, programmes can be designed to enable meaningful interaction among pupils from different school types, or even between diverse groups, irrespective of how those groups are defined — ethnicity, social class, or other forms of social classification.

Studies on intergroup contact typically examine how contact effects reduced homophilic tendencies, but few have investigated whether of a lack of contact between groups exacerbates it. Homophily may not be as rigid in plural societies where opportunities for intergroup interaction are systematically provided and where individuals are inevitably exposed to people from different ethnic backgrounds. The results of this study show that the friendships of students who attended ethnically exclusive schools are no less likely to be diverse than students who attended other school types, which implies that while homophilic tendencies may exist, institutions that by nature embody a lack of intergroup contact does not necessarily hinder the promotion of social cohesion.

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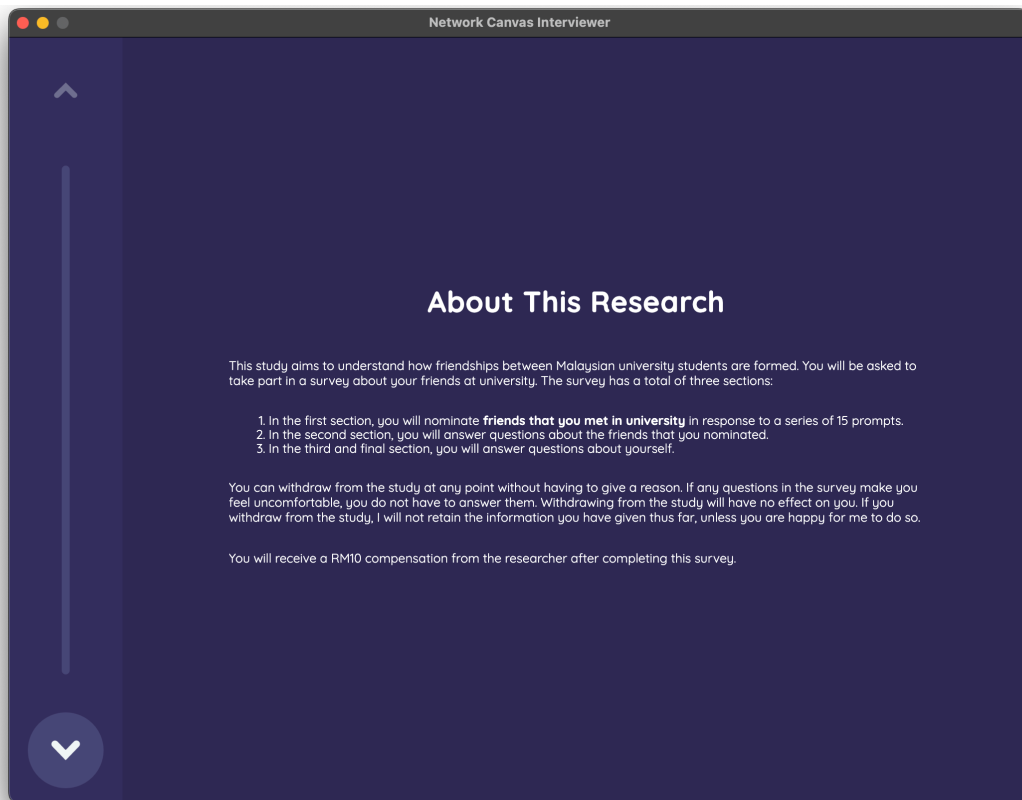
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Appendix 1: Survey Interface on Network Canvas



Network Canvas Interviewer

Consent

Please indicate if you would like to proceed with the survey.

I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and that I can withdraw from the study at any time, without having to give a reason.

☐

Network Canvas Interviewer

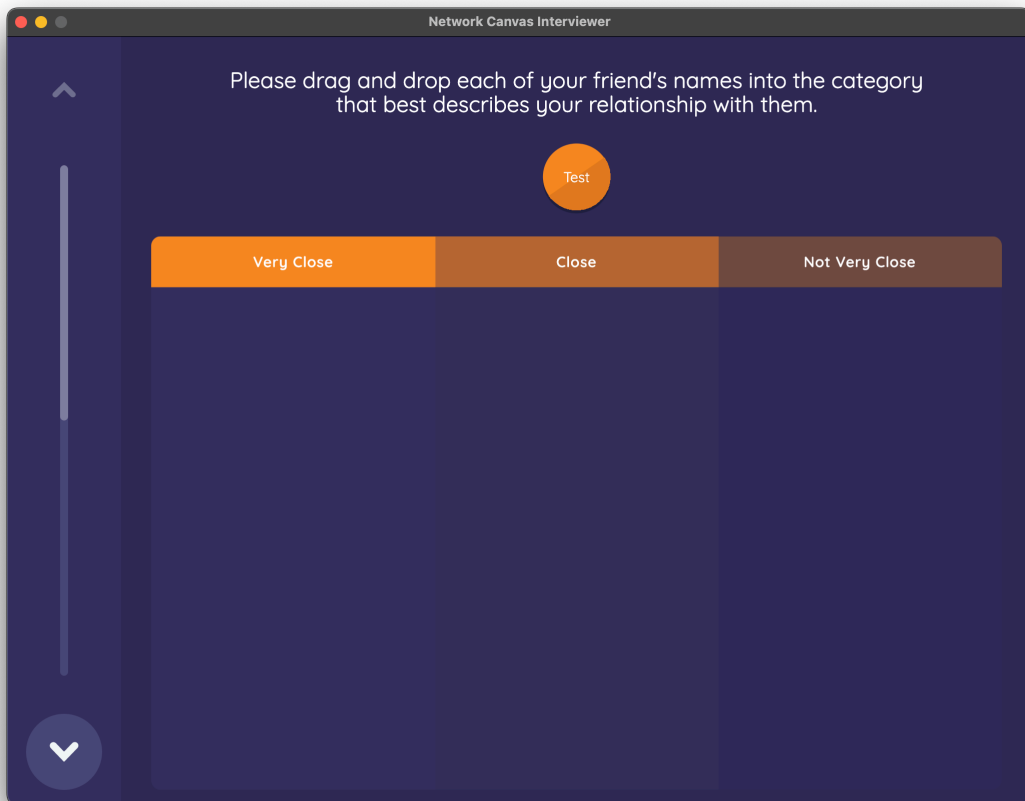
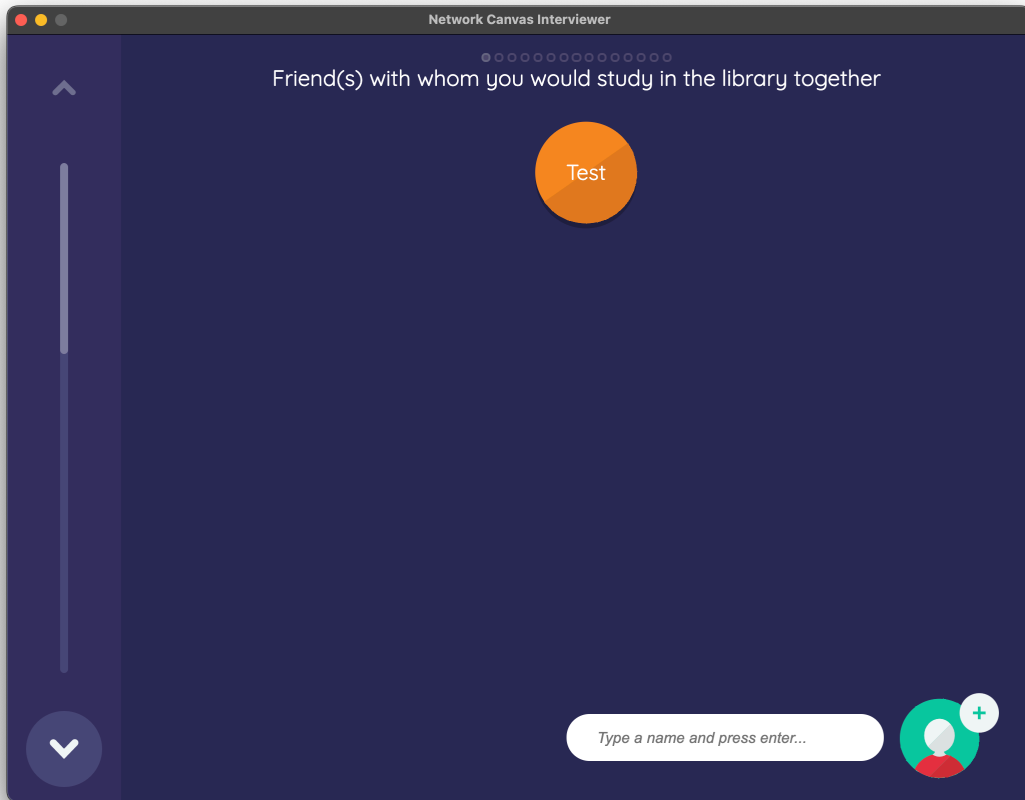
Section 1 of 3: Please Read These Instructions Carefully!

In this section of the survey, you will receive 15 prompts to help you nominate friends that you **met in university**. You can nominate a friend by clicking the icon on the bottom right of the screen and typing their name. (You may use pseudonyms, initials, first names, or nicknames to ensure confidentiality and anonymity)

The first prompt is "Friend(s) you'd study in the library with". After entering the names of your friends **made in university** that come to mind, click on the "down arrow" button on the bottom left of the screen to continue.

Please **spend some time** after reading each prompt to think about who to nominate. You may skip a prompt by clicking on the "down arrow" button on the bottom left of the screen if you do not wish to nominate any friends for that prompt.

You may nominate as many friends as you like for each prompt, as long as you met them **after entering university**. You may also repeat the same friend's name for multiple prompts.



Network Canvas Interviewer

Please drag and drop each of your friends' names into the category that reflects the ethnicity that you believe your friend best identifies with.

Test

Malay

Chinese

Indian

East Malaysian Ethnicities

Mixed

Other

Network Canvas Interviewer

Please drag and drop each of your friends' names to the category that best reflects the gender that you believe your friend most identifies with.

Test

Male

Female

Network Canvas Interviewer

↑

↓

Section 3 of 3: Some Questions About You

In this section, you will answer a few questions about yourself.

What ethnic group do you most identify with?

☐

 Malay

☐

 Chinese

☐

 Indian

☐

 East Malaysian Ethnicities

☐

 Mixed

☐

 Other

What kind of school did you attend for the majority of your primary education years?

☐

 Sekolah Kebangsaan

☐

 Sekolah Jenis Kebangsaan Cina (SJKC)

☐

 Sekolah Jenis Kebangsaan Tamil (SJKT)

☐

 Sekolah Agama (Islamic School)

☐

 International School

Appendix 2: Name Generator Questions in Section 1 of Survey

PROMPTS

1. Friend(s) with whom you would study in the library together
2. Friend(s) you would recommend to a job opening
3. Friend(s) with whom you would participate in volunteering projects
4. Friend(s) you consistently have meals with
5. Friend(s) whom you would want to be your best man / bridesmaid
6. Friend(s) whose birthday(s) you remember
7. Friend(s) with whom you share a similar hobby
8. Friend(s) you would go to the movies with
9. Friend(s) you would go shopping with
10. Friend(s) you would go to a concert with
11. Friend(s) you would travel to another country with
12. Friend(s) you would invite to your home
13. Friend(s) you would play boardgames or video games with
14. Friend(s) you would call when you're going through a difficult time
15. Friend(s) you would have deep conversations with

Appendix 3: Ego Information Captured in Section 4 of Survey

1. What ethnic group do you most identify with?
 - a. Malay
 - b. Chinese
 - c. Indian
 - d. East Malaysian Ethnicities
 - e. Mixed
 - f. Other

2. What kind of school did you attend for the majority of your primary education years?
 - a. Sekolah Kebangsaan
 - b. Sekolah Jenis Kebangsaan Cina (SJKC)
 - c. Sekolah Jenis Kebangsaan Tamil (SJKT)
 - d. Sekolah Agama (Islamic School)
 - e. International School
 - f. Private School / Home School / Others

3. Did you attend any other type of school for primary education? If you did, please list their type and the length of years you attended.

[Optional with open ended answer field]

4. What kind of school did you attend for the majority of your secondary education years?
 - a. Sekolah Menengah Kebangsaan (SMK)
 - b. Chinese Independent School
 - c. Sekolah Menengah Kebangsaan Agama (SMKA)
 - d. Maktab Rendah Sains MARA (MRSM)
 - e. International School
 - f. Sekolah Berasrama Penuh (SBP)
 - g. Vocational College / Technical Institute
 - h. Private School / Home School / Others

5. Did you attend any other type of school for secondary education? If you did, please list their type and the length of years you attended.

[Optional with open ended answer field]

6. Which university do you currently study at?
- a. Universiti Malaya
 - b. Universiti Kebangsaan Malaysia
 - c. Monash University
 - d. Sunway University
 - e. University of Nottingham Malaysia
7. What is your current year of study at university?
- a. Foundation / Pre-University
 - b. Year 1
 - c. Year 2
 - d. Year 3
 - e. Year 4
 - f. Masters
 - g. PhD
8. In what year were you born?
- Date in [YYYY] format option available for selection.
9. Which gender do you most identify with?
- a. Male
 - b. Female
10. In what language are you most fluent in? (Please only select one)
- a. English
 - b. Malay
 - c. Chinese
 - d. Tamil
 - e. Other