The Cohort Effect on Collective Memory of COVID-19 Among Malaysians: A Repeated Cross-sectional Study

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ABSTRACT

The spread of COVID-19 has brought major disruption and mass suffering globally. However, little is known about the impact of the pandemic on the construction of collective memory among Malaysian generational cohorts. Data was collected among 1,526 respondents in September 2020 (during the pandemic phase) and 883 respondents in October 2022 (during the endemic phase) using repeated cross-sectional quantitative surveys. Specifically, the studies were set to address two issues. First, to investigate the impact of the pandemic on Malaysians' collective memory and second, to determine whether the development of collective memory was connected to a critical period of adolescence. We specifically requested that Malaysians report "the historical events in Malaysia or in the world" that they felt were particularly significant and explained their answers. The data showed that COVID-19 was the most commonly reported event, as expected. Using logistic regression, we found that age was the strongest predictor of the highest-mentioned historical event, COVID-19. Although more than two years have elapsed since the pandemic, COVID-19 has significant cohort effects on collective memory, with the older generation registering lower recall relative to the younger generation, supporting the Critical Years Hypothesis.

INTRODUCTION

The world has been coping with health, societal, and economic consequences for more than four years after the COVID-19 pandemic started in late 2019. Although

reported cases and deaths are declining rapidly worldwide, and most countries around the world have lifted restrictions, the pandemic is far from over (United Nations, 2022).

The collective memory of a major catastrophe, such as COVID-19, has a large group effect. Compared to the older generation, the younger generation had a higher COVID-19 recall rate (Mustafa et al., 2021). Edkins (2003) noted that trauma always occurs and cannot be completely forgotten. Following a catastrophe, the disaster's memory narrative has a significant impact on the formation of personality and the shaping of values (Hutchison, 2016).

This study investigates the COVID-19 impact on Malaysians' collective memory in the post-pandemic era. This research is based on an extensive national survey with two repeated studies conducted in Malaysia from July to September 2020 (during the pandemic phase) and October to December 2022 (during the endemic phase) to determine whether COVID-19 has any influence on Malaysia's various generational cohorts' collective memories. In addition, based on surveys, we critically examine why people describe COVID-19 as the most significant event in their lives, even though more than two years have passed since the virus outbreak.

Collective Memory and Critical Year Hypothesis

A shared memory among a group that shapes their social identity is referred to as collective memory (Cordonnier et al., 2022).

Collective memory is the term for memories that a social group shares, whether cultural, religious, or national (Wertsch & Roediger, 2008). Collective memory, according to Schwartz (2008), "refers to the social distribution of beliefs, feelings, and moral judgments about the past" (p. 76). Collective memory combines a society's official and vernacular memory (Bodnar, 1992).

Durkheim (1912), one of the first philosophers to refer to collective memory, mentioned that for collective cognition to take place, people needed to physically come together to generate an experience that was shared by the group, leading them to define themselves and their beliefs, as well as serve as lessons to define the social values, beliefs, and norms of a community. Halbwachs (1952/1980), one of Durkheim's students, was the first to use the phrase "collective memory" (p. 48), and the author's work is considered to provide the conceptual basis for the investigation of social memory. According to Halbwachs (1925/1992), every collective memory relies on specific groups separated in location and time; the group creates the memory, while the individuals do the remembering process.

The number of empirical and philosophical studies on collective memory has steadily increased (e.g., Hirst et al., 2018; Roediger & Abel, 2015; Wertsch & Roediger, 2008). It is widely understood that factors such as the unique features of an event and its psychological impact influence how memories are formed, whether the event is personal or public (Edkins, 2003; Finkenauer et al., 1998); individual

differences, including the age and culture of the person recalling the event (Koppel et al., 2013; Meeter et al., 2010; Mustafa et al., 2021; Wang, 2009) and the setting in which the incident is recalled (Stone & Jay, 2019). Particularly, the motivations, goals, and circumstances of a group influence the production and recovery of memories of public events witnessed by the group (Abel et al., 2019; Wang, 2021).

Collective memory does not always present a clear and complete picture of past events. The present needs to shape how the past is understood, what is remembered and forgotten, and the morals drawn from past events (Hutton, 1993; Schwartz, 1991). The past provides values in addition to providing identity. While people shape the past, they are also shaped by it.

Schuman and Scott (1989) find generational effects on memory and deciding what past events are important. People tend to remember and prioritize events in their youth as the most memorable. The Critical Years Hypothesis, the fundamental concept underpinning collective memory, supports the statement. The "Critical Years" or formative years or critical period hypothesis was put forward to understand how the generations are developed based on collective recall of specific historical events. A generation is formed when distinct events impact people from the same birth cohort and shape them in diverse ways (Schuman & Corning, 2012).

Karl Mannheim's (1952) well-known essay, The Problem of Generations, stimulated the concept of the Critical Years

Hypothesis. Critical Years Hypothesis or the coming-of-age years, sometimes referred to as the formative years, are the stage of human development from late adolescence to young adulthood (Meredith & Schewe, 1994; Ryder, 1965). The formative years are characterized in previous research as beginning as early as 15 or 16 and ending between the ages of 24 and 27 (Becton et al., 2014; Holbrook & Schindler, 1994; Noble & Schewe, 2003; Schuman & Rieger, 1992). Schuman and Rieger (1992) generally classified the formative years as 13–25 years, but Mannheim recommended a key age span of 17–25 years.

Adolescence is the critical year when individuals become aware of historical and societal events. Historical events that occur during formative years are widely assumed to be vividly remembered, notwithstanding some variation in the lower and upper age limits of the formative years, because this is the time when a person's unique personal features and personality emerge and develop (Mustafa et al., 2021).

According to Yasseri (2022), collective memory is influenced by a complex interplay of individual experiences, social interactions, media portrayal, and broader sociocultural factors. The ongoing nature of the COVID-19 pandemic and the passage of time is believed to continue to shape and reshape collective memory. Furthermore, according to Hirst et al. (2018), collective memory and the understanding of historical events are shaped by social and cultural factors, including shared narratives, societal values, and the perspectives of different

social groups. Thus, a memory of a person and interpretation of a particular historical event would be influenced by their cognitive involvement in the same generational cohort's social group.

The COVID-19 catastrophe and its wide-ranging effects on various aspects of life would contribute to a higher likelihood of collective memory across different age groups. The extensive media coverage, public health measures, and societal changes associated with the pandemic may make it a memorable and salient event for many individuals. Each time the media highlight the pandemic tale on traditional and internet channels, the pandemic's impact will be felt in creating a collective global memory (Erll, 2020).

It is worth noting here that the Critical Years Hypothesis has received empirical support from various fields, including psychology, neuroscience, and early childhood education (see Budiawan, 2017; Constantin, 2013; Lee & Chan, 2018; Schuman & Corning, 2012, 2017; Schuman & Scott, 1989; Scott & Zac, 1993). In Malaysia, there is limited empirical evidence of generational collective memory. The elder generation recorded most evidence of collective memory, which involved significant historical events such as the Japanese occupation (Blackburn, 2009; Tay, 2015; Ting et al., 2017). Therefore, it is important that this study explore how COVID-19 affected Malaysians' collective memory as well as how critical years affected people's ability to recall the pandemic.

Collective Memory in Past Cross-sectional Research

Cross-sectional studies are often employed in research on collective memory to examine how different groups remember past events. These studies typically involve comparing the memories of various cohorts or demographic groups. For example, Constantin (2013) conducted a cross-sectional study in Beijing and discovered a "memory impulse" (p. 5) that structures both autobiographical and collective memory of historical events across different age groups. Similarly, using cross-sectional analysis, Cupi (2024) found that the media is crucial in constructing social constructs related to the collective memory of events before the 1990s. In another study, Bikmen (2023) conducted three cross-sectional surveys in the United States to test the effect of past pandemics on collective memories and future pandemic preparedness. Results recorded greater interest in learning about historical pandemics but not greater knowledge of events. However, greater knowledge of the pandemic contributed to higher future pandemic preparedness. The study further suggests that past pandemics can potentially become global memories but not global human identities.

COVID-19 and Other Historical Events from 2020-2022

The outbreak of COVID-19 has been ongoing for more than four years, causing a significant impact on people across the world. According to the World Health Organization (WHO; 2024), there are

approximately 775,522,404 confirmed COVID-19 cumulative cases worldwide, with 7,049,617 reported cumulative deaths, making it one of the most extensive pandemic histories (Dong et al., 2020). Doses of 5.47 billion vaccines have been given (WHO, 2023).

COVID-19 was first discovered in Wuhan. In March 2020, infections were discovered in practically every country, and the World Health Organization (WHO) declared the outbreak of a global pandemic on March 11, 2020 (WHO, 2020). After the Spanish Flu in 1918, COVID-19 was the greatest and deadliest pandemic; more than 50 million people worldwide were killed (Douglas et al., 2019).

In Malaysia, three waves of the pandemic outbreak hit the population aggressively. Three imported cases of COVID-19 were discovered in Malaysia on January 25, 2020. Based on each case's travel history, imported cases are infections contracted outside of Malaysia. The three cases were detected after tracing and screening after the Singapore Ministry of Health reported that eight close contacts of a confirmed case of a Chinese person in Singapore had entered Johor (Ministry of Health Malaysia, 2020). The first waves took place between January 25 and February 16, 2020. Beginning on February 27, 2020, and ending on September 30, 2020, was the second wave of the pandemic. On February 27, new cases started appearing as people who had been to China, Japan, Italy, and Australia started showing symptoms. From September 8, 2020, to March 20, 2021, a state's election

campaigns and lobbying operations were mostly responsible for the third wave of the outbreak's sharp rise in cases. On October 8, 2020, there were 14,368 confirmed cases overall at the commencement of the third wave. By December 3, 69,095 cases were up 381% in just two months (Outbreak.my, 2020).

The Malaysian government implemented the Movement Control Order (MCO) on March 18, 2020. This order eventually led to the complete closure of educational institutions, government agencies, and corporate properties, the prohibition of any mass assembly for religious, social, or cultural purposes, and all domestic and international travel. Following a slow drop in Malaysia's confirmed cases, the partial lockdown was prolonged numerous times with growing relaxation of the restrictions.

The pandemic was steadily under control entering the year 2022. The removal of COVID-19 restrictions happened in stages. For example, travelers do not require a pre-departure or on-arrival COVID-19 test. They can enter Malaysia without COVID-19 vaccination status, masks in outdoor and indoor public places, reduced quarantine period for positive cases, and RTK or PCR COVID-19 tests become optional.

COVID-19 clearly dominated 2020-2022. Changing economic, cultural, and societal structures shocked the world. Other than COVID-19, bracketing the two years between early 2020 and the end of 2022 were other global historical events. In February 2022, the world was shocked to hear about Russia's military invasion of

Ukraine. The war between the two countries, compounded with the post-COVID-19 impact, has caused major food and energy crises worldwide. With Ukraine being the major producer of wheat and Russia the major exporter of crude oil, the war has caused a global shortage of the two main commodities, leading to global price hikes.

On home soil, several major political turmoil struck Malaysia during the two years. Amid the COVID-19 crisis, which led to a national emergency declaration, Malaysia faced serious political unrest, leading to the collapse of two coalition governments, the resignation of three prime ministers and the appointment of two new prime ministers. The ongoing political crisis since 2020 has led to a snap general election in November 2022, which again resulted in another political crisis, a hung parliament, due to the failure of one coalition party to achieve a simple majority. The political crisis ended with the formation of a unity government involving a newly established coalition of 19 political parties.

METHODOLOGY

Research Design

We used repeated cross-sectional (RCS) surveys carried out in September 2020 and October 2022 to examine the extent of recall memory of historical events among the Malaysian population. RCS design is a research methodology where data is collected from multiple cross-sectional samples at different points in time (Lebo & Weber, 2014). RCS can capture temporal changes efficiently, cost-effectively, and

with low attrition bias while retaining generalizability and statistical power. This approach is commonly used in social sciences, public health, and other fields to study population changes over time.

Overall, we have two main sources of evidence collected from two points in time. First, we reanalyzed 2020 data originally reported by Mustafa et al. (2021). Second, we report new data collected in 2022 to assess changes in collective memory during the COVID-19 pandemic in early 2020 and the endemic phase of COVID-19 in 2022.

Targeted respondents from five regions of Malaysia were given a set of questionnaires at both time points using online platforms. A link was developed and distributed to enumerators, mostly university students from the country's five regions. In the early stages of the pandemic, the first survey was carried out between September and October 2020, while a repeat survey was carried out during the endemic phase of COVID-19 from September until December 2022.

Population and Sampling Procedure

The total number of respondents needed for both surveys was estimated based on the population of those 18 and older. The Department of Statistics Malaysia estimates that approximately 32.7 million people lived in Malaysia in 2020.

Using Raosoft sample size calculation, it was determined that the minimum sample size required for the study was 385. The sample size was suggested based on a 5% margin of error, a confidence level of 95%,

and a population size of 32 million. There were 1,526 respondents in the first survey and 883 in the repeated survey in 2022. The samples were divided into twelve age groups in both surveys, using categories 18–20 years old, 21–25 years old, 26–30 years old, 31–35 years old, 36–40 years old, 41–45 years old, 46–50 years old, 51–55 years old, 56–60 years old, 61–65 years old, 66–70 years old and 71+ years and above. Like Mustafa et al. (2021), the present study used a five-year interval in the sample distribution to avoid the confirmation bias associated with using a wider age range for each cohort. The first cohort started at 18 to capture young adolescents in their formative years and develop unique generational characters.

The same sampling strategies were used for both surveys. First, eligible respondents were identified using a clustered sampling technique. States were divided according to region, namely North, South, East, West and East Malaysia, to facilitate the sampling process. Given the impracticality of obtaining respondents from every state in Malaysia, the present study intentionally selected five states to serve as representatives for each region. These states include Selangor/Kuala Lumpur for the central region, Penang for the northern region, Johor for the southern region, Terengganu for the east region and Sarawak for East Malaysia. The inclusion procedure required the respondents to live or work in the representative states. Within each representative state, research enumerators were appointed to invite eligible respondents to participate in the study.

The researchers developed the questionnaire for both surveys utilizing SurveyMonkey applications. Enumerators appointed through the SurveyMonkey link distributed the questionnaire, leveraging various social media platforms, including WhatsApp, Facebook, Instagram, and Telegram. Additionally, enumerators conducted face-to-face surveys to enhance accuracy in screening and provide further assistance and clarification, particularly to senior citizens.

Afterward, the purposive sampling method was utilized to gather samples for each age cohort. A non-probability sampling strategy called "purposive sampling," sometimes known as "judgment sampling," selects participants based on whether the researcher believes they meet the requirements of the study (Hair et al., 2009).

Research Instrument

Two pilot tests were meticulously carried out during two phases of the pandemic. The first pilot test was conducted in June 2020, involving 50 respondents, while the second was completed in early August 2022, yielding responses from 48 participants. In both pilot tests, thorough reliability analyses were performed, revealing high-reliability values for the variables of the studies. Furthermore, the studies employed expert judgment to assess content validity, ensuring the instrument comprehensively addressed all pertinent facets of the investigated constructs.

In these two surveys, respondents were asked an open-ended question following

methods by Mustafa et al. (2021), Harold and Fong (2017), Scott and Zac (1993), and Schuman and Scott (1989): "Please describe one or two historical events in Malaysia or in the world that you remembered the most (i.e. political, cultural, economic, war, digital development, disease outbreak)."

Respondents need to identify two significant events in their lives, state their age at the time the events occurred, and rate their level of involvement during that period of the event mentioned based on a 5-point Likert scale, where 1 represents "not at all" and 5 represents "immersively involved."

Data Analysis

The two survey data underwent comprehensive analysis through statistical techniques, primarily descriptive and logistic regression analyses. Leveraging IBM SPSS for Windows version 25.0, descriptive analysis was employed to elucidate the trends across different age groups regarding the collective memory of COVID-19. Additionally, logistic regression was utilized to explore the impact of education, income, and age on significant historical events in Malaysia, offering a nuanced understanding of their interrelationships.

RESULTS

Table 1 shows the demographic background of respondents gathered during two phases of the COVID-19 outbreak: the pandemic (2020) and the endemic (2022). Both data used the same category of age group, education level and income. A research study 2020 involved 1526 respondents, while in 2022, involving 883 respondents in total. Both surveys were similar, with females making up most respondents. Most respondents have a maximum bachelor's degree as their education level and an average monthly salary of less than RM 2000.

The most cited national and global events of 2020 and 2022 are listed in Table 2. The presented descriptive analysis was used to show the trend between the age groups. COVID-19 was the most frequently mentioned in 2022, just as in 2020. Since the outbreak began two years ago, remembrance of the COVID-19 pandemic has increased significantly by 28.8%. A slight decrease in the percentage for Malaysia's Independence Day in 1957 was observed, with 8.4% in the 2020 survey and 7.7% in the 2022 survey. The 2004 Tsunami suffered the greatest drop in the percentage of mentions, from 9.2% (2020) to 1.4 % (2022). A significant drop in mentions between the two surveys was also seen by the 14th Malaysian General Election (2018), with 7.9% in 2020 and 1.6% in 2022, possibly because of the latest Malaysia 15th General Elections held in 2022. Two events were not mentioned in the 2022 survey: (1) the introduction of GST 2015 and (2) P. Ramlee's music/film in the 1960s.

Table 3 indicates the specific mention of COVID-19 in 2020 and 2022 surveys by age groups. The presented descriptive analysis recorded a positive increase in the recall of COVID-19, especially among the younger groups, those between 18 and 40 years of age. We observed lower recall of COVID-19, especially among the older groups, those from 41 to 70 years old.

Table 1
Respondents demographic background

Variable	Variable items	Responses in 2020		Responses in 2022	
		Frequency	**Percent**	**Frequency**	**Percent**
Gender	Male	659	43.4	297	33.6
	Female	860	56.6	586	66.4
Age-group	18–20	163	10.7	99	11.2
	21–25	203	13.3	101	11.4
	26–30	150	9.8	77	8.7
	31–35	144	9.4	120	13.6
	36–40	114	7.5	60	6.8
	41–45	136	8.9	68	7.7
	46–50	123	8.1	52	5.9
	51–55	115	7.5	43	4.9
	56–60	104	6.8	54	6.1
	61–65	86	5.6	62	7.0
	66-70	105	6.9	79	8.9
	>71+	83	5.4	68	7.7
Education Level	None	35	2.3	11	1.2
	Primary School	116	7.6	54	6.1
	Secondary School	477	31.4	182	20.6
	Diploma	405	26.6	358	40.5
	Bachelor's Degree	374	24.6	229	25.9
	Master's degree	75	4.9	30	3.4
	PhD	19	1.2	3	0.3
	Others	20	1.3	16	1.8
Income	<RM1000	493	42.4	525	59.5
	RM1001–RM2000	300	25.8	94	10.6
	RM2001–RM3000	166	14.3	83	9.4
	RM3001–RM4000	96	8.2	63	7.1
	RM4001–RM5000	46	4.0	48	5.4
	>RM5001	63	5.4	70	7.9

Source: Authors' work

Figure 1 in the graph compares the percentage of COVID-19 mentioned by different age groups between the 2020 and 2022 surveys. In both time points, we observed similar recall patterns of COVID-19, with a downward sloping or downtrend line pattern as the age increases.

As can be seen, COVID-19 mentions were specifically high among young adults between 18 and 35 years, which further provided stronger empirical evidence for the Critical Years Hypothesis. A highly noticeable upward trend was recorded in 2022, with those aged 31–35 recording the

Table 2
National and global events most mentioned in 2020 and 2022

Historical Events	Responses in 2020		Responses in 2022		% Change: 2020 to 2022
	Frequency	Percentage	Frequency	Percentage	
COVID-19	621	40.7	614	69.5	+28.8
The 2004 Tsunami	141	9.2	12	1.4	-7.8
Independence of Malaysia 1957	128	8.4	68	7.7	-0.7
Malaysia 14th General Election (2018)	120	7.9	14	1.6	-6.3
Introduction of GST 2015	86	5.6	0	0	N/A
May 13, 1969 incident	53	3.5	15	1.7	-1.8
Economic crisis 97/98	33	2.2	16	1.8	-0.4
The collapse of Highland Tower 1993	29	1.9	3	0.3	-1.6
Sporting events (i.e. Thomas Cup)	25	1.6	3	0.3	-1.3
P. Ramlee's music/film in the 1960s	22	1.4	0	0	N/A

Source: Authors' work

Table 3
Percentage of mentions of COVID-19

Age group	Responses in 2020		Responses in 2022		% Change: 2020 to 2022 in mentions COVID-19
	Percentage	N	Percentage	N	
18–20	11.1	163	11.5	99	+0.4
21–25	10.9	203	10.8	101	-0.1
26–30	9.0	150	9.6	77	+0.6
31–35	9.2	144	14.0	120	+4.8
36–40	6.6	114	6.8	60	+0.2
41–45	7.9	135	7.7	68	-0.2
46–50	8.0	121	5.6	52	-2.4
51–55	7.1	115	5.1	43	-2.0
56–60	7.4	104	5.2	54	-2.2
61–65	7.9	86	7.6	62	-0.3
66–70	9.2	105	8.7	79	-0.5
>71+	5.8	83	7.5	68	+1.7

Source: Authors' work

highest recall of the pandemic compared to the same group in 2020.

Subsequently, we observed a consistent downward trend of recall of the pandemic from those aged 36–60 in both data sets. The downward trend was more noticeable during the first survey in 2020 compared to samples in 2022. Generally, based on the decreasing
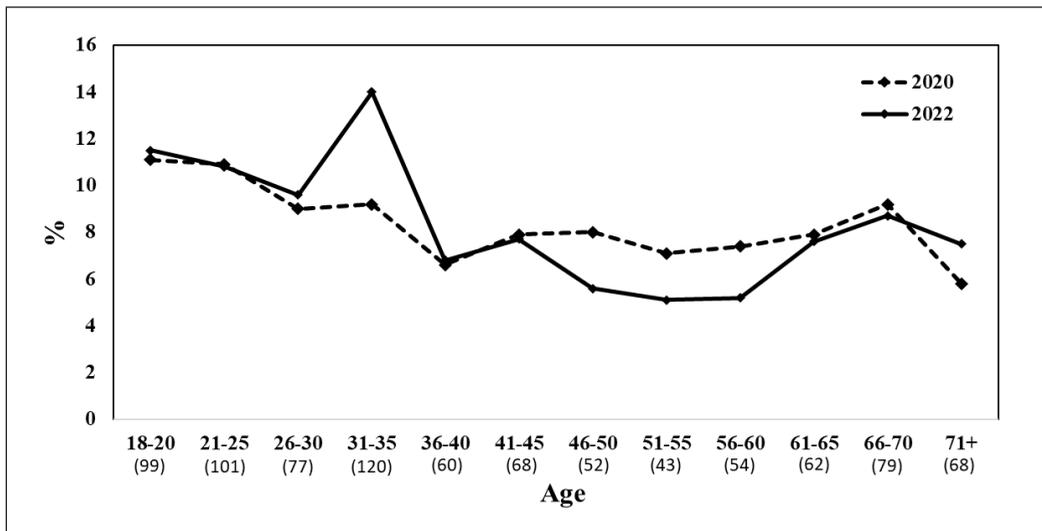
Figure 1. COVID-19 mentions by age
Source: Authors' work

pattern, it may be safe to conclude that the recall of COVID-19 was noticeably lower in the 36–60 age group, strengthening the argument for the Critical Years Hypothesis. COVID-19 was visibly lower among the middle age group (36–60 years old), which provided stronger support for the Critical Years Hypothesis.

While we expect the trend to be consistently lower for the older group, the opposite trend was observed for those aged 66–70, we observe a slightly higher recall of the pandemic compared to the middle-aged groups observed earlier, which could reflect a much greater concern about the impact of COVID-19 on health among those from the oldest group in the study.

Table 4 shows noticeable differences between the respondents of different age groups in recall of COVID-19. The one-way ANOVA recorded significant differences between age groups on the frequency of mentions of COVID-19, with an *F*-value of 4.018 and a significance *p*-value of 0.000. Following the significant ANOVA result, the post-hoc analysis (Tukey's HSD test) was conducted to determine the exact differences between each comparison pair. Even though not all pairwise comparisons recorded significant differences, the result indicates that individuals aged 18–20 mentioned COVID-19 as the major historical event in their life significantly more than those aged 46–50, 56–60, and over 71. Conversely, individuals aged 56–60 recalled COVID-19 as significantly less than those aged 18–20, 26–30, and over 71. These results highlight notable differences in the recall of COVID-19 among different age groups. Younger individuals in their formative years tend to mention COVID-19 more frequently compared to older groups. Despite the pandemic's economic, health and social impact on people of all generations, the

Table 4
One-way ANOVA and Tukey post-hoc test on frequency of mention of COVID-19 by age group

Factor	ANOVA		Post-Hoc Tukey's Test			
	F	P	Age group		Mean Difference (I-J)	Std. Error
			I	J		
Mention of COVID-19	4.018	0.000				
			18–20	21–25	0.18182*	0.04715
			18–20	46–50	0.19231*	0.05619
			18–20	56–60	0.27778*	0.05554
			21–25	>71	-0.18182*	0.05348
			26–30	56–60	0.21284*	0.05677
			56–60	>71	-0.27778*	0.06100
			61–65	56–60	-0.19713*	0.05954

Note. $*p<0.05$
Source: Authors' work

findings provide deeper insights into the differential impact amongst the generations on the recall of the pandemic.

As indicated in Table 5, Logistic Regression was used to determine how education, income, and age impacted Malaysians' recollection of significant historical events. Based on Table 5, the odds ratio is derived through logistic regression, where each factor is treated as a binary dependent variable (either yes or no), and age, income, and education are considered predictors. In both surveys, age best predicts at least four historical occurrences. In both surveys, namely COVID-19, the

Independence of Malaysia in 1957, the 14th General Election (2018) and the sporting event (i.e. Thomas Cup). It indicates that age influences the respondents' collective memory of historical events.

However, we observe a slightly different finding in 2022 with regard to other predictors, namely income and education. In the latest study, income was a strong predictor of recall of COVID-19, the 14th General Election (2018) and the economic crisis 97/98. Additionally, it was discovered that education was the best predictor of recall of the economic crisis 97/98 and the 14th General Election (2018) in 2022.

Table 5
Logistic regression on the effect of education, income and age on important historical events in Malaysia

	Responses in 2020			Responses in 2022		
	Education Odds ratio (OR)	Age Odds ratio (OR)	Income Odds ratio (OR)	Education Odds ratio (OR)	Age Odds ratio (OR)	Income Odds ratio (OR)
1. COVID-19	…	0.76***	…	0.80*	0.93***	1.0**
2. Tsunami 2004	…	…	…	…	…	…
3. Independence of Malaysia 1957	…	-1.18*	…	…	1.13***	…

Table 5 *(continue)*

	Responses in 2020			Responses in 2022		
	Education Odds ratio (OR)	Age Odds ratio (OR)	Income Odds ratio (OR)	Education Odds ratio (OR)	Age Odds ratio (OR)	Income Odds ratio (OR)
4. 14th General Election (2018)	…	1.46*	…	1.35***	…	1.0**
5. Introduction of GST 2015	…	…	…	…	…	…
6. May 13, 1969 incident	…	…	…	…	…	…
7. Economic crisis 97/98	-2.12***	…	…	1.33**	1.08*	1.0**
8. The collapse of Highland Tower 1993	…	…	…	…	…	…
9. Sporting event, i.e., Thomas cup	…	-2.62*	…	…	0.89*	…
10. P. Ramlees' music/film 1960	…	…	…	…	…	…

Note. Based on logistic analysis of each event or change using three predictors: education, income and age. The cell figures are statistically significant odds ratio (coefficient/standard error); *$p<0.10$; **$p<0.05$; ***$p<0.01$
Source: Authors' work

DISCUSSION

What effect did COVID-19 have on Malaysians' collective memory over two years? To what extent can the collective memory of COVID-19 be attributed to the critical period of adolescence? To answer the first research question, overall, findings in 2020 and 2022 have provided consistent empirical evidence on the impact of COVID-19 on the construction of Malaysians' collective memory. Although two years after the outbreak of the pandemic, with other major historical events occurring during the period, the memory of COVID-19 remains firmly among Malaysian adults. Findings from the first survey conducted during the COVID-19 pandemic (July 2020–September 2020) and the endemic phase (October 2022–December 2022)

highlighted the role of the COVID-19 catastrophe in constructing collective memory among Malaysians.

To answer the second research question on whether the collective memory of COVID-19 can be attributed to the critical period of adolescence, results affirming the Critical Years Hypothesis were also quite consistent in both surveys. In both surveys, COVID-19 mentions are relatively high and sharply demarcated among those in their early 30s. This age group is often referred to as "millennials" and represents a significant portion of the workforce and young families. The COVID-19 pandemic has caused major disruption to their careers and finances. Many millennials have faced job losses, pay cuts, or reduced working hours, leading to financial instability and uncertainty. For millennials with young

children, the pandemic has also created significant challenges. The closure of schools and daycare centers has forced many parents to juggle work and childcare responsibilities, leading to feelings of burnout and exhaustion during the two years. All this contributed to the collective recall of COVID-19.

Mannheim (1952) reiterated that late adolescence and early adulthood are the formative years during which a distinctive personal outlook on events emerges. He further suggested that the years between 17 and 25 are the most crucial formative years defining a generation because this is when distinctive personal traits and personalities emerge. According to Griffin (2004), formative years are particularly significant because "they are associated with the crystallization of both personal identity and knowledge of social realities beyond the self" (p. 545). As indicated in past studies, the age range for the formative year is quite arbitrary. Schuman and Rieger (1992) broadly defined the critical years as 13 to 25 years, while Mannheim (1952) suggested an age range of 17–25 for the critical years. The age range's bottom and higher limits are quite subjective.

As seen in Figure 1 above, a declining slope can be seen among those in the middle age group ranging from 36–65 years with lower recall of COVID-19 in both surveys. However, detailed observations show that the recall of COVID-19 was significantly lower in the latest survey in 2022 compared to those in 2020. The recent progress from the pandemic to the endemic phase brought more structure to the day-to-day lives of many Malaysians, resulting in a lower recall of COVID-19 compared to 2020, when Malaysians were grappling with uncertainties during the outbreak.

While we expect the recall of COVID-19 will be on a consistently downward trend for the oldest individuals sampled in the study, we observed a slight increase of COVID-19 mentions among those in their late 60s, considered part of the older adult population. This age group is at a higher risk of severe illness or death from the virus and, as such, has faced unique challenges during the pandemic. From a health perspective, COVID-19 posed a more severe impact among people in this age group, notably those with health issues such as lung or heart disease, diabetes, or immune system disorders especially those with health conditions such as lung or heart disease, diabetes, or conditions that affect their immune system. Older adults have also faced significant social and emotional challenges during the pandemic. Isolation measures reduced social interactions, and limitations on visiting loved ones in healthcare facilities have taken a toll on their mental well-being, leading to a high recall of the pandemic.

Comparing the two survey findings, we observe that the range for the formative years is much wider, from 18–36 years, compared to those found in previous studies. While Mannheim (1952) claimed that a key age range is between 17 and 25 years, Schuman and Rieger (1992) classified the formative years as roughly between 13 and

25. Considering the incident's recentness and priority, the age range for COVID-19 may be broader. Data obtained in 2022 confirmed the speculation made earlier in 2020. The impact of COVID-19 extends beyond the traditional "emerging adulthood" age range and affects a wider population due to its recency and global significance. Schuman and Corning (2012) assert that because of increased media coverage and heated debate among students and peers, the arbitrary range of the critical years may be bigger or begin sooner. The pandemic has impacted people of all ages, from children to older adults. Each age group may experience unique challenges and consequences related to COVID-19. The range of impact is indeed wider for COVID-19 due to its global reach, rapid spread, and broad socioeconomic implications.

A Logistic Regression analysis was conducted to provide stronger empirical evidence. In 2022, the results of Logistic Regression displayed a similar significant age effect on the recall of COVID-19 as in 2020. In both surveys, age is the strongest predictor for remembering COVID-19 compared to other predictors such as income and education. On top of that, the same analysis also supported the age effect in most of the historical events mentioned, namely the Tsunami of 2004, the Independence of Malaysia in 1957, the 15th General Election (2021), the 14th General Election (2018) and the Introduction of GST 2015. Each generational cohort has a stronger recall of historical events during their formative years.

It is vital to remember that collective memory creation is a complex process influenced by a variety of social, cultural, and psychological elements. Given the ongoing nature of the COVID-19 pandemic and the major structural change it has brought since its onset, more empirical research will be needed to examine the long-term collective memory of COVID-19 and its impact on different age groups and societies.

CONCLUSION

In conclusion, our study, conducted in 2020 and 2022, provides important support for the Critical Years Hypothesis and sheds light on the collective memory concerning the COVID-19 pandemic. We found that individuals in their formative years exhibited a stronger recall of the COVID-19 crisis compared to older adults. This trend remained consistent over two years after the pandemic's emergence. Furthermore, the Logistic Regression analysis for both years yielded additional empirical evidence for the cohort effect in shaping collective memory, not only for COVID-19 but also for other major historical events in Malaysia. It suggests that individuals' age cohorts play a significant role in determining their memory of significant events. This study holds significant value as it investigates the collective memory of a major global event during its early years. Unlike previous research on collective memory, which often focused on events that occurred in the distant past, our study captures the formation and evolution of collective memory as the

COVID-19 pandemic unfolded in real time. By examining the recall patterns and cohort effects, we contribute to understanding how collective memory is influenced by age and the recency of the event.

These findings have implications for future studies on the long-term impact of the COVID-19 pandemic on collective memory, as well as for understanding how other ongoing events shape collective memory in their early stages. It is the first study in Malaysia to test the effect of COVID-19 on collective memory and the Critical Years Hypothesis. Through this study, we know that every generation is unique because every generation remembers different historical events. Hence, their remembrances of historical events lead to different beliefs, values, lifestyles, and attitudes. Understanding these generational differences can be valuable in various contexts, such as marketing, workplace dynamics, and social policy. It is vitally important for marketers, businesses, and public policymakers to pay attention to changes in behavior and habits to implement strategies and tactics to maintain existing consumers and attract new ones.

Despite valuable findings, it is important to acknowledge some limitations that should be considered when interpreting the findings. Firstly, our study employed a cross-sectional design, collecting data at two points (2020 and 2022). This design limits our ability to examine changes in collective memory over time within individuals. Longitudinal studies would provide a more comprehensive understanding of

the trajectory and evolution of collective memory on COVID-19.

Secondly, our study's findings are based on a specific sample of respondents, which may not fully represent the diversity of the population. The sample may have included individuals with particular characteristics or experiences that could have influenced their recall of the COVID-19 pandemic. Therefore, caution should be exercised when generalizing the findings to the broader population.

Thirdly, our study relied on self-report measures to assess recall and collective memory. Self-report measures are subject to subjective interpretation and potential response biases. Respondents may have been influenced by social desirability or their perceptions of what is expected.

Lastly, our study was conducted within a Malaysian context and its historical events. The findings may not directly apply to other countries or cross-cultural contexts. The impact of the COVID-19 pandemic on collective memory could vary across different societies and may be influenced by unique cultural, social and historical factors.

Future research should address these limitations through larger and more diverse samples, longitudinal designs and a comprehensive examination of various influencing factors to provide a more nuanced understanding of the collective memory of the COVID-19 pandemic.

Overall, our study emphasizes the importance of considering the Critical Years Hypothesis and the influence of age

cohorts when studying collective memory, particularly for significant events like the COVID-19 pandemic. Further research is warranted to explore the long-term effects and the evolving nature of collective memory surrounding this global event.

ACKNOWLEDGEMENT

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