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Overcoming constraints of the model minority stereotype to advance Asian American health

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Abstract

Asian Americans are the fastest growing U.S. immigrant group, projected to become the largest immigrant group by 2065, but the quantity of research on Asian Americans' health has not mirrored changing demographics. Asian Americans have been understudied for more than 25 years, with only 0.17% of NIH expenditures allocated to projects *including* Asian American, Native Hawaiian, and Pacific Islander populations (Đoàn et al., 2019). This disproportionality may result in part from the model minority stereotype (MMS) being extended to health, perpetuating the idea that Asian Americans are well-positioned with regard to health status and therefore associated research is not essential. Accordingly, the aims for this manuscript are threefold: a) bring attention to the inadequate representation of the Asian American population in health-related science, b) question the MMS in health, c) outline potential pathways through which the MMS limits what is knowable on Asian American health issues and needs. We discuss the limited meaningfulness of non-representative aggregated statistics purporting the model minority image and provide counterexamples. We also present a stereotype-constraints model with the MMS contributing to a bottleneck for Asian American health-related knowledge, accompanied by present-day circumstances (e.g., sparse data, few psychologists/ behavioral medicine scientists focused on Asian American health). We conclude with initial recommendations for addressing MMS-associated constraints in psychology and more broadly.

Keywords

Asian; model minority; health; cancer; understudied populations; stereotype

Asian Americans are the fastest growing immigrant group in the U.S. and are projected to become the largest immigrant group by 2065, outnumbering Hispanic/Latinx Americans (Lopez et al., 2017). Yet, support for research on Asian Americans' health has not mirrored changing demographics. Asian Americans, Native Hawaiians, and Pacific Islanders¹

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(AANHPIs) were 6% of the U.S. population in 2018 (Chen, 2019), but only 0.2% of the 2018 NIH clinical research budget was allocated to AANHPI-specific projects (Đoàn et al., 2019). In fact, underrepresentation of AANHPIs has persisted for more than 25 years, with an average of 0.17% of NIH expenditures involving, but not necessarily focusing on, AANHPI populations (Chen, 2019). One reason for the disproportionality in funding and research may be that, as several scholars have suggested (e.g., Chen & Hawks, 1995; Ibaraki et al., 2014), the longstanding model minority stereotype (MMS) has been applied to Asian Americans' health.

The MMS arose following two media articles in 1966: New York Times Magazine's "Success Story, Japanese-American Style" (Petersen, 1966) and the U.S. News and World Report's "Success Story of One Minority in U.S." about Chinese Americans. Promoted as self-sufficient and successful despite holding a minority status, Asian Americans were pitted against other racial minorities in part to uphold structural inequalities amid the civil rights movement (Kawai, 2005). The MMS represented a marked change from the previously negative stereotypes (e.g., "yellow peril" (Hurh & Kim, 1989)) applied pan-ethnically before, during, and after World War II to enact anti-Asian immigration policies and colonization of Asian/Pacific Islander (A/PI) countries (Kawai, 2005).

Following the creation of the MMS, one adverse consequence has been a perpetuation of the MMS in mental and physical health—that Asian Americans are well-off and not in need of scientific or clinical attention. Because others have described the MMS' influence upon Asian Americans' mental health (e.g., Cokley et al., 2013; Kiang et al., 2017; Lee et al., 2009; Sue et al., 1995), this manuscript primarily examines the MMS in relation to Asian Americans' physical health and the ways psychology can help narrow the knowledge gaps. Understanding contributors to Asian Americans' health² is relevant for all areas of psychology; preventing or managing chronic disease and promoting physical health in Asian Americans is within the jurisdiction of psychological science (McDonald, O'Connell, & Suls, 2015) and practice, as biopsychosocial factors collectively determine physical health over the life course (Adler, 2009). However, very little research on Asian Americans' physical health is available, and the MMS needs to be overcome to advance all Asian Americans' health.

Are(n't) Asian Americans a Model Minority in Health?

A first step to dismantle the MMS is to consider whether data *meaningfully* support the contention that Asian Americans are a model minority in health. The model minority image of Asian Americans can be prompted via cursory understanding of aggregated Asian data. To present examples of how this might occur, the following statements are purposefully presented to reflect lay discourse surrounding Asian Americans' health as a "model minority": a) Asian American adults are "less likely than all U.S. adults to be

¹Though our main focus is on Asian Americans as defined by the "Asian" racial/ethnic category in the 1997 Office of Management and Budget Federal Register Notice (Office of Management and Budget, 1997), we present aggregated data on AANHPIs or Asian/Pacific Islanders (A/PIs) when the original source does not present disaggregated information. We do not intend to suggest that NHs/PIs should be subsumed under an umbrella term of Asians. We also use the term "Asian(s)" when referring to the U.S. racial categorization as presented in the original sources; we do not intend to solely refer to immigrants who are not naturalized.

²including physical health-related mental health

[self-reporting] fair or poor health” (p. 1; Bloom & Black, 2016); b) Compared to other racial/ethnic groups, Asian Americans have the lowest rates of hypertension and the lowest mortality rate from heart disease (National Center for Health Statistics, 2019); c) Cancer burden, measured in age-standardized disability-adjusted life years, is lowest for Asian Americans for all cancers combined (Lortet-Tieulent et al., 2016).

These types of statements make it seem that Asian Americans are indeed a model minority on indicators of health. Arriving at such conclusions is not particularly meaningful for a multitude of reasons, however. Of major importance, despite the evidence that more than a third of U.S. Asians have limited English proficiency (LEP), surveys typically are not provided in Asian languages and suffer from sampling bias (Islam et al., 2010). When sampling is more inclusive, disparities are evident. For example, Chinese immigrant cancer survivors have a higher mortality rate than U.S.-born Chinese cancer survivors (Gomez et al., 2010).

Asians are also one of the most diverse groups in the U.S., with widely varying backgrounds (e.g., immigration histories) across more than 37 ethnocultural groups (Kagawa-Singer et al., 2010). U.S. Asians also experience the largest within-group wealth gap, in which the lowest income strata show the least growth from 1970-2016, compared to other racial/ethnic groups (Kochhar & Cilluffo, 2018). In that variations in historical and SES-related factors are relevant for health disparities (Adler, 2009; Myers, 2009), deriving “model minority” conclusions about Asian Americans’ health holds little substantive meaning.

Asian Americans Are Not a Model Minority: Within-group Data Tell a Story of Disparities

Within-group examination of aggregated data seemingly supporting the MMS provides evidence that the MMS is inaccurate. Revisiting the earlier example statements on health perceptions, heart disease, and cancer burden provides proof-of-concept. First, although U.S. Asians are less likely overall (10.4%) than all others (12.4%) to report fair/poor health, a significantly higher proportion of Vietnamese adults (16.8%) report fair/poor health than do non-Hispanic White adults (NHWs) (Bloom & Black, 2016), and LEP Vietnamese adults are even more likely to report fair/poor health after adjusting for SES, nativity, and language proficiency (Kandula et al., 2007). Second, despite having the lowest rates of hypertension and heart disease mortality as an aggregated group, many Asians have greater proportionate mortality³ from hypertension than NHW counterparts (i.e., Chinese women=1.69, Filipino women=1.50, Asian Indian women=1.46, Korean women=1.30, Japanese women=1.23, Chinese men=1.27, Filipino men=1.38, Asian Indian men=1.18; Jose et al., 2014). Asian Indian men and women and Filipino men also are more likely than NHWs to die from ischemic heart disease (Jose et al., 2014); Asian Indian men and Vietnamese men have the highest premature mortality due to ischemic heart disease (Iyer et al., 2019). Third, although cancer burden is lowest for Asian Americans for all cancers combined, Asian Americans have higher cancer burden compared to NHWs for specific cancers (i.e., stomach and liver

³When the proportionate mortality ratio is >1, hypertension accounts for a larger percentage of deaths in the comparison group than the NHW reference group.

for both men and women; gallbladder for men; cervical and non-Hodgkin lymphoma for women; Lortet-Tieulent et al., 2016).

Casting East Asians as a Model Minority Is Misleading

An acontextual ascription of the MMS to the *typically* light-skinned East Asians⁴, presumed to have higher status in the U.S. (Kuo et al., 2020), is also a misstep. East Asians in the U.S. are diverse across many health-related demographics (e.g., region, SES). For example, Koreans in Los Angeles have the lowest median net financial worth among the largest Asian groups, with lower net worth compared to Latinos (~\$20,000 gap) and African Blacks (>\$45,000 gap) (De La Cruz-Viesca et al., 2016). Moreover, many East Asians with LEP (~1/3; Pew Research Center, 2013) are not adequately represented in health-relevant studies.

Counterevidence for East Asians as a model minority in health is particularly evident in cancer control science⁵. Cancer has been the leading cause of mortality in Asian Americans since the 2000s⁶ (Chen et al., 2018). Below we present non-exhaustive examples across the cancer control continuum suggesting that it is erroneous to apply the MMS to Asians, including East Asians, given their vulnerabilities in cancer risk, preventive behaviors, and cancer-related outcomes. Often, data show greater disparities for the LEP, foreign-born, less U.S.-acculturated.

Example 1: Living Environments Associated with Cancer Risk

Asian Americans are at greater risk for exposure to environmental health hazards than NHWs (e.g., Houston et al., 2014; Payne-Sturges & Gee, 2006). Notably, Chinese and Korean populations in the U.S. have higher cancer incidence due to carcinogenic air pollutants than do Black, Hispanic, NHW and American Indian groups (Grineski et al., 2017), and neighborhoods with higher (versus lower) proportions of non-English speaking Asians have greater cancer risk from air pollutants (Grineski et al., 2017). In California, Korean and Japanese women have greater exposure to mammary gland carcinogens than NHW women (Quach et al., 2014).

Example 2: Human Papillomavirus (HPV) Vaccination

HPV vaccination is an effective method of preventing cervical cancer in women. However, compared to other foreign-born women of color, foreign-born Asian women have the lowest adjusted odds of HPV vaccine initiation compared to U.S.-born NHWs (OR=0.26; Agénor et al., 2018). This disparity is of special concern for East Asians because >76% of Chinese and Koreans in the U.S. are foreign-born (Pew Research Center, 2013). Also, compared to all U.S. women (88%; Marlow et al., 2013), Korean women in California have the lowest HPV awareness (41%) followed by Vietnamese (48%) and Chinese (49%) women (Becerra et al., 2020). Asian American women with LEP have even lower HPV awareness (17%) (Becerra et al., 2020). In that HPV awareness is one of the best predictors of HPV vaccination

⁴There also are naturally darker-skinned East Asians.

⁵“Cancer control science is the conduct of basic and applied research in the behavioral, social, and population sciences to create or enhance interventions that, independently or in combination with biomedical approaches, reduce cancer risk, incidence, morbidity and mortality, and improve quality of life” (National Cancer Institute, 2011)

⁶Until 2012 when cancer became the leading cause of death for Hispanics/Latinos (Chen et al., 2018)

(Bastani et al., 2011), LEP East Asian foreign-born women may be at increased risk for cervical cancer.

Example 3: Breast Cancer Incidence, Mortality, and Mammography Use

A/PIs in the U.S. evidenced the highest increase in breast cancer incidence relative to other racial/ethnic groups between 2012-2016 (DeSantis et al., 2019), a pattern also observed for younger Koreans and Southeast Asians in California (Gomez et al., 2017). Breast cancer-specific mortality is greater for foreign-born Chinese, Filipina, South Asian (Asian Indian, Pakistani, Sri Lankan, or Bangladeshi), Korean, and Vietnamese women than U.S.-born Japanese women (Gomez et al., 2010). Mammography can be important for preventing cancer-specific mortality (Gomez et al., 2019) but, compared to NHWs, Asians are the only racial/ethnic group less likely to have received a mammogram, statistically controlling for breast cancer risk factors, SES, and health care resources (Elewonibi et al., 2018). Asians also had the lowest rate of up-to-date mammography in 2018, compared to other racial/ethnic groups (American Cancer Society, 2019). In California, Korean and South Asian women have the lowest mammography use among the largest Asian groups (Chawla et al., 2015; Gomez et al., 2017).

Example 4: Quality of Life in Cancer Survivorship

Aggregate data on health-related quality of life (QOL) in cancer survivorship may show that A/PIs, in general, report similar levels of QOL as NHWs (e.g., Lockett et al., 2011). However, accruing research suggests that some Asians fare relatively poorly. Chinese and Vietnamese immigrant breast cancer survivors report lower QOL (e.g., physical and emotional well-being) compared to NHW and Japanese American women (Kagawa-Singer et al., 2017). Other MMS counter examples for East Asians include findings that Chinese immigrant breast cancer survivors: have significantly lower QOL compared with NHW norms⁷ (Lu et al., 2018); have a higher rate of sleep disturbance compared to NHWs (Gonzalez & Lu, 2018); are less likely to have physical health-related distress resolved than NHWs (Wang et al., 2012); and, among less acculturated survivors, have worse physical functioning than NHWs (Wang et al., 2019). Chinese and Vietnamese breast cancer survivors with LEP also report lower QOL and greater symptom distress (J. K. Yi et al., 2011). Research with Chinese immigrant breast cancer survivors hint at reasons for potential disparities: women mentioned feeling stigmatized because of their cancer diagnosis, kept it a secret from family, co-workers, and friends, and labeled themselves as tainted, undesirable, or handicapped (Lu et al., 2014; Warmoth et al., 2017).

Summary

A broad-strokes conclusion of Asian Americans' health advantage is erroneous. The "model minority" conclusion becomes even more problematic when limitations of existing studies are considered, including non-representativeness of adults of low SES or with LEP; racial/

⁷Although the Chinese breast cancer survivors lived in the U.S. for 18 years on average, their QOL indicated by the Functional Assessment of Cancer Therapy-General Scale (FACT-G) was low ($M=73.3$), compared with NHW female cancer patients (normative value=82.1 (Brucker et al., 2005)) and breast cancer survivors ($M=84.3$ (Rogers et al., 2015)). A difference of 5-7 points is deemed clinically significant.

ethnic comparisons made without appropriate adjustments (e.g., lower BMI thresholds for some subgroups (Fang et al., 2019)); and prevalence measured by self-reported diagnoses (National Center for Health Statistics, 2019). When health-related disparities are interrogated, the inaccuracy of the MMS with regard to Asian American health merits acknowledgment.

The MMS Constrains Understanding of Asian American Health Issues and Needs

If the MMS is not supported by evidence, why is it that the health of Asian Americans remains under-examined? Among the many possible reasons, the pervasiveness of the MMS (Wong et al., 1998) since the 1960s may be part of the explanation. With infinite information to process in the social world, people naturally use strategies to be cognitively efficient (Allport, 1954) and the automatic application of stereotypes (Bargh, 1984; Devine, 1989) can stem from both implicit bias and explicit attitudes within one's awareness (Dovidio & Gaertner, 2010).

Americans, including Asian Americans, may perceive and expect U.S. Asians to be a model minority, in addition to perceiving that the MMS is a shared reality (Chao et al., 2013). The MMS might persist in part because people better store and emphasize information matching a presumably shared stereotype than stereotype-inconsistent information (Kashima, 2000). As such, we propose that the MMS is an invisible cultural force (Gone, 2011) shaping socioecological systems over time (Bronfenbrenner, 1977; Johnson et al., 1995). What results is a bottlenecked understanding of Asian Americans' health (Figure 1). We present a stereotype-constraints model, in which constraints upon advancing the science of Asian Americans' health occur at multiple levels (funding/policies, research/healthcare, public). We also postulate that the MMS is reified by present-day circumstances of sparse, non-representative data on Asian Americans' health, and a paucity of psychological scientists who study Asian Americans' health (Figure 1). We are not suggesting that the lack of relevant science stems solely from the MMS, but that the MMS potentially acts as one key contributor.

Level One: Funding and Policies

Following the advent of the MMS, misunderstanding of limited, extant, A/PI health data (e.g., the Heckler Report (Heckler, 1985)) has contributed to the notion that most or all Asian Americans are better positioned in health than are other racial/ethnic groups. Such perceptions can contribute to a low preference for Asian Americans benefiting from redistributive funding/policies (Chao et al., 2010). Additionally, funding/policy decisions can be made under suboptimal and time-pressured conditions, perhaps allowing greater room for using heuristics and implicit stereotypes (Chugh, 2004) that "model minority" Asians may not need increased funding or inclusive policies. Although direct evidence of the MMS in funding and policy decision making is absent at present, the disproportionately low allocation of funds to improve Asian American health suggests the effects of the MMS.

Akin to the neglect of Asian Americans in U.S. mental health policy (Nagayama Hall & Yee, 2012), Asian Americans have been overlooked in health-related funding and policies that would foster the understanding of Asian American health issues. In 2012, large charitable foundation support of a range of services (e.g., arts, education, health) for A/PIs (4%) was lowest compared to support of services for Black (22%), Hispanic/Latino (18%), and Native American (6%) populations (Foundation Center, 2012). Only 0.2% of NIH expenditures from 1992-2018 were for research *including* A/PIs, with just 10.8% of those 529 awards (i.e., 0.005% of NIH expenditures) being A/PI population-*centered* training awards (Đoàn et al., 2019) essential for retaining researchers as independent investigators (Nikaj & Lund, 2019). Asian Americans also were not a focus in the 2010 NIH Centers for Population Health and Health Disparities program funding designated to promote health equity by “[building] research teams that are transdisciplinary” and “training a new generation of health disparities researchers” in cancer and cardiovascular disease (p. S395; Golden et al., 2015). The communities served by the 10 funded centers were: African American (four grants), Hispanic/Latino (three grants), rural (two grants), and American Indian/Alaska Native (one grant) (Golden et al., 2015). Such funding trends constrain the growth of the scientific community investigating Asian American health and restrict the efforts needed to characterize the scope of Asian American health issues.

Similarly, health science-related policies within the context of the MMS may contribute to additional constraints. Although Asian American health research need not be led entirely by Asian American researchers, the majority foreign-born, LEP, and ethnoculturally diverse Asian American subpopulations would benefit from research incorporating an understanding of cultural values maintained across generations (LaFromboise et al., 1993). Moreover, conducting culturally appropriate research often requires deep pre-existing knowledge (Kreuter & Haughton, 2006) of the underlying cultural structures (Resnicow et al., 1999). Researchers of Asian descent with both cultural knowledge and language fluency offer strengths in conducting research with understudied Asian communities, but policies have not encouraged their training. For example, Asian American researchers are the only racial minority group explicitly excluded from eligibility for diversity-related NIH funding. Only recently, a clause added that researchers from other racial/ethnic groups should participate if they can “[demonstrate] convincingly to be underrepresented by the grantee institution” (Department of Health and Human Services, 2018). In response to policy that did not clarify the eligibility for underrepresented Asians until 2018, Asian researchers interested in Asian American health may not have pursued such funding (Đoàn et al., 2019). Furthermore, diversity initiatives for mentorship at universities largely have overlooked Asian Americans, perhaps in part due to the MMS, despite evidence that greater support is warranted (Chin & Kameoka, 2019).

In summary, the MMS likely constrains what is possible to know about Asian American health, via limited resources/opportunities as determined by funding and policies. Potential consequences include narrowed domains of research by what is deemed fundable, smaller segments of the Asian American population represented through funding, a small number of Asian American health-focused scientists supported to conduct research, and the stunting of budding Asian American health researchers’ careers.

Level Two: Research and Healthcare Provision

As shown in Figure 1, consequences of the MMS at the level of funding/policies compounds to how the MMS may constrain knowledge of Asian American health at the level of research and healthcare provision. Narrowed research domains, a disproportionately small Asian American population represented by funded proposals, and few Asian American health-focused scientists may result in little available evidence to justify nuanced research in Asian subpopulations. The MMS may also constrain Asian American health science by influencing what type of research is conducted by the larger scientific community. Errors in information synthesis (e.g., conclusions supporting the MMS based on data excluding LEP Asians in poor health) and cognitive tendencies to retain stereotype-confirming information (Kashima, 2000) can contribute to the absence of Asian Americans in studies, particularly when the requisite, added complexity of research designs poses a barrier. The works of and/or collaborations with community-connected, language-proficient, multicultural scientists promises to propel inclusion of a wider range of Asian Americans in research. Yet, limited support for those researchers at the funding/policy level likely constrains the pool of scientists.

As an illustration, a brief search of 10 scientific journals in health psychology and behavioral medicine⁸ suggests that health psychology is not immune to the potential effects of the MMS. From 1900-2020, of the 10,075 U.S.-based articles, only 95 (0.94%) were studies mentioning Asian Americans in the title, abstract, or keywords, and 54% of the 95 contained within-group or ethnic-specific analyses. Additionally, mirroring evidence that a minority of scientists examining racial/ethnic groups are researchers of color (Hartmann et al., 2013; Roberts et al., 2020), 28.6% of the 77 corresponding authors were Asian.⁹ A minority of the corresponding authors were housed in psychology departments at the time of publication (28.2% for all authors, 11.7% for Asian authors), suggesting that a majority of health psychology/behavioral medicine research including Asian Americans is neither being conducted in psychology nor does it have Asian researchers as senior authors.¹⁰ Research on Asian American health foregone, possibly in part from MMS-associated barriers for scientists, limits relevant knowledge.

The MMS may also have serious healthcare implications, determining how many clinically screened, diagnosed, or treated Asian Americans are available for recruitment to health research. Stereotypes influence decision-making processes (Dovidio & Gaertner, 2000), particularly when time is limited (Macrae et al., 1994) as is common in healthcare settings.

⁸Web of Science search of “(CU=(USA) AND TS=(asian OR korean OR chinese OR filipin* OR asian indian OR vietnamese OR thai OR cambodian OR hmong OR burmese OR bangladesh* OR indonesian OR japanese OR laotian OR malay* OR mongolia* OR pakistan* OR singapore* OR sri lanka* OR taiwan OR myanmar OR bhutan* OR nepal* OR brunei OR asian american)) AND DOCUMENT TYPES: (Article)” in Health Psychology Review, Health Psychology, Psychosomatic Medicine, Annals of Behavioral Medicine, Translational Behavioral Medicine, International Journal of Behavioral Medicine, Journal of Psychosomatic Research, Journal of Behavioral Medicine, International Journal of Clinical and Health Psychology, British Journal of Health Psychology. See Supplemental Appendix A for details.

⁹As in Hartmann et al. (2013), race/ethnicity was solicited via email. Authors were informed that their names would not be associated with the summary count (56% response rate). For non-responders with last names of potential Asian origin, as in Roberts et al. (2020), two coders independently examined online images for agreement upon Asian ethnicity.

¹⁰Similarly, when examining NIH chartered review group members in behavioral health-relevant study sections (ARM, BMIO, IPTA, PDRP, PRDP, SPIP, PPAH, APDA, MESH, NMB, NNRS, CIHB, CLHP, DIRH, HDEP, HSOD, BGES, SSPA, SSPB), 41 (10.82%) of the 379 members were affiliated with Psychology, and an estimated 0.26% are Asian in Psychology (1 person; 2.4% of the 41).

Implicit racial biases also influence healthcare providers' decision making (Dovidio & Fiske, 2012) and the quality of patient-provider communication (Maina et al., 2018), especially in the case of subjective interpretation of patients' self-reports (Soares et al., 2019). Unfortunately, the influence of the MMS on medical screening, diagnosis, and care for Asian Americans is yet to be studied. Investigation is needed to test whether the MMS adds to existing barriers in health care, especially for LEP patients whose physicians perceive inadequate time for discussion or report not trying as hard for patients displaying distrust (Guerra et al., 2007).

When the MMS is primed in undergraduate students, Asian Americans are perceived as having better mental health and, in a symptom recall task, fewer clinical mental health symptoms are remembered for vignettes depicting an Asian vs. a NHW person (Cheng et al., 2017). Such MMS-produced effects may exist in healthcare, as suggested by health disparities data. In an evaluation of emergency medical management of pain across racial/ethnic groups, Asians were least likely (OR=0.69) to receive a pain assessment and were less likely than NHWs to receive pain medication for traumatic injuries (OR=0.76), after adjusting for age, gender, insurance status, and geographic location (Kennel et al., 2019). In another example with care coordination, which is a primary predictor of A/PIs' lower ratings for received care (Collins et al., 2017), A/PIs' primary care providers had the lowest patient-provided ratings (vs. NHW patients' ratings) for having patients' medical records or relevant information prepared during visits, having up-to-date information on care from specialists, and having timely follow-up on test results (Martino et al., 2016). Similarly, recent data show that Asians get less expedient care prior to cancer diagnosis compared to NHWs, Blacks, and Hispanics (Farias et al., 2020).

MMS effects may also be stronger in health domains with "known" group advantage, such as with Asian Americans' low base rate of alcohol use disorders. In a vignette study of psychologists in training, Asians were less likely than NHWs to be given an alcohol use disorder diagnosis despite a clinical description that warranted one (Cheng et al., 2018). Supporting prior findings that medical professionals can stereotype minority patients (Van Ryn & Burke, 2000), an image of the healthy and accommodating Asian American could result in missing healthcare needs (e.g., potentially lower referral to screenings; Ibaraki et al., 2014).

Data on smoking cessation recommendations are another good example of the possibility that the MMS affects health care. Smoking is a risk factor for many cancers, particularly lung cancer, a leading cause of cancer-related mortality in Asian Americans. Although Asians have the lowest smoking prevalence in the U.S. (9.0%; Jamal et al., 2018), within-group smoking prevalence is highest for Koreans (20.0%) and Vietnamese men (24.4%) (Martell et al., 2016).¹¹ Smoking cessation recommendations are critical due to the role of second-hand smoke in lung cancer mortality (Samet et al., 2009) affecting Asians with low smoking prevalence (Thompson et al., 2016). Yet, 2000-2015 National Health Interview Survey data from cigarette smokers show that Asians were the least likely to receive advice to quit from healthcare professionals (34.2%) compared to American Indian/Alaska

¹¹Rates are likely underestimated in national surveys conducted in English.

Native (38.1%), Hispanic (42.2%), Black (55.7%) and NHW adults (60.2%), with smoking cessation recommendations decreasing linearly only for Asians (U.S. Department of Health and Human Services, 2020).

In summary, the MMS likely constrains what is possible to know about Asian American health via underrepresentation of Asian Americans, especially those with LEP, in research and reliance on samples of Asian Americans who are already receiving health care, which excludes those who are never screened, referred, or diagnosed and who drop out from inadequate care.

Level Three: Public Awareness

Paralleling the public's overestimated perception of Asian Americans' wealth (Kuo et al., 2020), the public may overestimate the good *health* of Asian Americans per the MMS. Any pre-existing influence of the MMS upon public awareness is likely magnified by the consequences of the MMS at Levels One and Two. A consequence could be less engagement of Asian Americans in activities that foster health-related knowledge, such as taking part in research, engaging in community discourse about health, and creating community behavioral norms.

Asian Americans may be persuaded to match in-group attitudes when they perceive that their community believes the MMS (Chao et al., 2013; Stangor et al., 2001). A perceived shared belief in the MMS would then transfer to social norms about health and health-related behaviors (Ajzen, 1985; Rosenstock, 1974). To the extent that the MMS is internalized, perceived susceptibility to illness will be lower, as will perceived threat to health and perceived benefits of taking preventive actions (Rosenstock, 1974). Data on preventive health behaviors are suggestive of a MMS effect on Asian Americans' health awareness. Asians who smoke have the lowest intention to quit in the next six months compared to all other U.S. racial/ethnic groups (Soulakova et al., 2017). Asian Americans, particularly those with LEP (Kao et al., 2016), are less likely to engage in recommended leisure-time physical activity than non-Asians (Kandula & Lauderdale, 2005). Also, despite a greater proportion of Asian Americans living with undiagnosed type 2 diabetes (due to atypical presentations in lower BMI and younger age; CDC, 2019), they are the least likely to get screened (Tung et al., 2017) and may not request it (Hsu et al., 2015) in the absence of diagnosed hypertension (P. Tran et al., 2020).

The MMS may also contribute to Asian Americans' lower engagement in health advocacy and activities fostering knowledge about Asian American health, by increasing psychological distress (i.e., depression, anxiety, stress; Atkin et al., 2018) and negative attitudes toward help-seeking (Gupta et al., 2011; Kim & Lee, 2014). Being aware of the MMS or of close others endorsing the MMS (Sinclair et al., 2006) may create a sense of being aberrant when Asian Americans experience health problems, contributing to feelings of stigma or shame. For example, Asian American youth with low academic performance (therefore violating the MMS) experienced worse health in the forms of greater suicide risk and substance abuse in comparison to African American youth with low academic performance (Whaley & Noel, 2013). A study of Asian American women suicide survivors

also noted the negative influences of the MMS (Noh, 2018) upon health and stigma, but more research is needed on this topic.

Within-group discrimination may also be present (Richeson & Sommers, 2016) and, for some Asian Americans, negative interpersonal consequences for breaking a stereotype (Phelan & Rudman, 2010) may add to existing barriers (e.g., LEP, mistrust) for engaging in the community or in research. In instances where healthcare provision is perceived as discriminatory based on the MMS, any cultural tendencies to endure problems alone (Chou & Feagin, 2015) along with MMS internalization, may discourage some Asian Americans from advocacy or social activism (J. Tran & Curtin, 2017) relevant to health.

Summary

We propose that, over time, the MMS and its associated constraints have collectively bottlenecked the knowledge base on Asian American health, thereby contributing to the maintenance of the MMS and obscuring an accurate portrait of Asian Americans' health (Figure 1). The present context of sparse data and few Asian American health scientists serves to strengthen the MMS-associated constraints upon each level (i.e., funding/policies, research/healthcare, public awareness) and to sustain the knowledge-constraining mechanisms (e.g., limited resources/opportunities, limited inclusion, stigma/shame). Specifically, the MMS' influence on funding and policies have likely contributed to barring the development of foundational data and the next generation of Asian American health-focused scientists. If indeed researchers are directed away from examining a wider range of Asian American health issues, as a result of lack of funding, hard-to-find mentorship, heuristic thinking, and low public engagement in research and community health, then the consequences of sparse data and few scientists will continually perpetuate the MMS in health. The current knowledge deficit does not mean that important needs and disparities do not exist; more awareness and deliberate effort are needed to probe inter- and intra-group variations while acknowledging that what is presently knowable is only a partial window into Asian American health.

Recommendations for Demarginalizing the Health-related Needs of Asian Americans

As stated throughout, the associations between the MMS and how it might function to hinder knowledge regarding Asian American health are largely unexamined. More psychological research is needed to test which existing structures are most in need of change. Certainly, additional possible mechanisms could be added to the stereotype-constraints model (e.g., MMS-induced perceptions of threat (Maddux, Galinsky, Cuddy, & Polifroni, 2008) affecting the various levels of constraint), and sociocultural factors unrelated to the MMS also constrain knowledge on Asian American health. Nevertheless, we offer recommendations for psychological research and initiatives to demarginalize the health-related needs of Asian Americans masked by the MMS given the: pervasiveness of the MMS, evidence of Asian Americans being disproportionately under-studied, small literature examining nuances in Asian Americans' health, and data suggesting possibilities of the MMS "at play".

Investigate and Address Proximal Contributors Maintaining the MMS

The circumstances of sparse, non-representative, or aggregated data and few Asian American health-focused scientists may be the primary proximal contributors maintaining the MMS and its influences on health (Figure 1). In that stereotypes partly depend on being conditioned by what information is available (Tversky & Kahneman, 1973), efforts are needed to increase sample representativeness (e.g., people with low SES or LEP) for comprehensive data on Asian American health and to carefully present data, which in turn may help bolster the pool of scientists who will use, create, and disseminate such information. Assuming the presence of factors important for reducing stereotypes (e.g., motivation to process new information (Devine, 1989; Fiske et al., 1999) and egalitarian goals (Moskowitz et al., 1999)), repetition of exposure to and acknowledgment of stereotype-disconfirming information (Kawakami et al., 2000) may ameliorate consequences of the MMS on Asian American health science over time.

Moving beyond sampling contributing to the predominantly Western, educated, industrialized, rich, and democratic (WEIRD) data in psychology (Henrich et al., 2010), population-focused approaches including community-based participatory research (CBPR) could help generate needed data. For example, in a pilot study of expressive writing with Mandarin/Cantonese-speaking U.S. cancer survivors, CBPR procedures involving community partners at every phase contributed to a successful 95% recruitment rate over four months and 100% intervention compliance (Lu et al., 2012). Continued community partnership promoted the completion of an expressive writing RCT in 96 Mandarin/Cantonese-speaking U.S. cancer survivors (Lu et al., 2017). Other successful CBPR studies reaching LEP participants via lay health workers also provide precedent (e.g., smoking cessation in Vietnamese Americans (Tsoh et al., 2015); colorectal cancer screening in Hmong (Tong et al., 2017)).

By incorporating community-based approaches to investigate biopsychosocial correlates of health, psychology has much to contribute to understanding variations in Asian American health not fully explained by demographic and health care access factors (Elewonibi et al., 2018; Ryu et al., 2013). Many understudied topics are also in need of psychological research (e.g., sleep (M. H. Hall et al., 2009) and eating behaviors (Argueza et al., 2020)), particularly using multilevel designs. Contributions from psychology also are needed to test and revise existing constructs and models (Nagayama Hall et al., 2016) in order to increase knowledge for improving Asian Americans' health. What is effective in non-Asian populations may not function similarly in Asian Americans with diverse sociocultural backgrounds. For example, research with primarily NHW adults has found emotional disclosure to be beneficial for a variety of outcomes including QOL (Frattaroli, 2006). However, emotional disclosure did not enhance QOL at 6-month follow-up in an expressive writing RCT with Mandarin/Cantonese-speaking Chinese American women (Lu et al., 2017); Surprisingly, the cancer-facts control condition was more effective by helping women cognitively process the cancer experience. A follow-up trial found that a culturally tailored condition combining cognitive reappraisal and emotional disclosure was most beneficial (Lu et al., 2018).

More broadly, to combat the MMS, careful presentation and use of Asian American health statistics are needed. For aggregate Asian American data, findings should be presented in abstracts and discussion sections with an understanding that the MMS may perpetuate the invisibility of Asian American health needs. In line with a health equity perspective (Srinivasan & Williams, 2014), findings should also be framed in a manner that best advocates for the Asian American community, especially when health disparities remain despite improvements (e.g., liver cancer incidence declining for A/PIs, but still exceeding incidence in Black and NHW groups). In describing any overall Asian American group advantage, a conscientious approach is required which involves presenting any existing within-group distinctions (e.g., age, sex, income, education, cultural practices) as well as emphasizing limitations of the data. Taking the extra step to examine added dimensions of variation and conscientious presentation can reduce the likelihood that the pan-ethnic term “Asian American”, originally coined to bring benefit to a marginalized community (Spickard, 2007), is misapplied and masks needs within the Asian American community. More research is needed to clarify when, for whom, and in what context Asian American health resilience occurs, and interpretation of findings should convey respect toward a racial minority community that historically has been “other”-ized.

Act to Change Mechanisms of MMS-Associated Constraints

Another avenue to confront the bottlenecked knowledge base on Asian American health is to target potential mechanisms of MMS-associated constraints.

Level One: Advocating for Funding and Policy to Increase Resources and Opportunities

Greater advocacy is needed for increased funding of Asian American health science and improved policies promoting the inclusion of Asian American communities and development of Asian American health-focused behavioral scientists. Fortunately, some policies supporting the advancement of Asian American health have been implemented over time¹². An examination of publications on the Web of Science including the keywords “health”, “behavior”, “psychology”, with “Asian American”¹³ reveals some benefit for the body of knowledge in Asian American health, segmented by periods before and after key policy changes^{12, 14}. The number of publications on Asian Americans in psychology/behavioral medicine increased over the past several decades¹⁴, with the largest growth¹⁵ (392%) between 1990-1999 and 2000-2009. However, narrowing of the gap has stalled, with the growth rate between 2000-2009 and 2010-2019 (179%) being nearly equivalent to non-Asian American psychology/behavioral medicine literature (180%). Similar to

¹²1999: 1st White House Initiative on A/PIs “to improve the quality of life of [A/PIs] through increased participation in Federal programs where such persons may be underserved” (The White House, 1999); 2000: 1st NCI-funded Asian American cancer network (Chen et al., 2018) and the launch of the NIMHD (Minority Health and Health Disparities Research and Education Act of 2000, 2000); 2009: Restoration of the White House workgroup for A/PIs (The White House, 2009); and 2011: Revision of U.S. data collection standards to include AANHPI subgroups (U.S. Department of Health and Human Services, 2011)

¹³Web of Science search with (TS=(Asian American AND health AND behavior) OR TS=(Asian American AND health AND psychology)) AND CU=(USA) AND LANGUAGE: (English) AND DOCUMENT TYPES: (Article)

¹⁴Asian American: 60 (1990-1999), 295 (2000-2009), 823 (2010-2019) vs. non-Asian American: 8,085 (1990-1999), 23,045 (2000-2009), 64,557 (2010-2019). Asian American numbers from the Web of Science search are overestimates because they include articles not centrally focused on Asian Americans.

¹⁵((# pubs more recent decade – # pubs earlier decade) / # pubs earlier decade)*100. For example, the growth rate for Asian American publications between periods 1990-1999 and 2000-2009 = ((295-60)/60)*100 = 392%

the JAMA report on NIH expenditures (Đoàn et al., 2019), Asian Americans remain substantially underrepresented in the psychology/behavioral medicine literature over three decades: 0.75% during 1990-1999, 1.26% during 2000-2009, and 1.26% during 2010-2019. Increasing funding for the science of Asian American health and the number of Asian American health-focused behavioral scientists and scientific reviewers is crucial.

Institutional initiatives should also be bolstered to meet the mentorship and training needs of future Asian American health-focused scientists. Funding of training institutes for the development of grant proposals, methodologic and analytic skills, and culturally appropriate research designs is needed. Workshops to maximize the use of large public-use datasets would benefit trainees, as would organized opportunities to build networks of collaborators and mentors. Recommendations are available for mentoring future scientists of Asian heritage while attending to cultural influences (e.g., Chin & Kameoka, 2019) and diverse backgrounds (Wyatt et al., 2019), which also may be useful for developing institutional initiatives.

Level Two: Shifting Research and Healthcare Infrastructure toward Inclusive Practice

Health science needs greater inclusion of Asian samples—particularly the often-excluded LEP, foreign-born immigrants. A large proportion of health research is with relatively wealthy, educated, NHW persons in universities or academic medical centers, and a shift is needed to examine understudied groups in diverse contexts (Croyle, 2015; Henrich et al., 2010). Cross-institutional and transdisciplinary efforts to harmonize data collection efforts are needed (Đoàn et al., 2019) alongside small population research (Srinivasan et al., 2015). Team science may be especially relevant for hard-to-reach Asian samples; options for pursuing collaborations are rapidly expanding with latest technologies for communication and research.

Regarding the MMS and healthcare provision, research is warranted to determine maximally effective approaches. Self-management of biases is possible with practice (Dovidio & Fiske, 2012), and training healthcare professionals to be aware of the potential harms of the MMS on decision making, referrals, diagnoses, and treatment could be useful. Preventive action can also be taken, given substantial evidence that suboptimal, stressful, and time-pressured environments can lead to increased stereotyping and use of heuristics (Dovidio & Fiske, 2012; Macrae et al., 1994). For instance, performance metrics to improve efficiency or reduce costs can result in reduced time with patients, and reforming these types of healthcare system structures may be beneficial. It may also be prudent to develop objective, standardized procedures that reduce the influence of heuristics or implicit bias in medical settings (Soares et al., 2019). Improved healthcare provision for all Asian Americans will provide opportunities for advancing Asian American health science as well.

Level Three: Raising Public Awareness and Reducing Stigma

Raising the public's awareness about the inaccuracy of the MMS in health and its contribution to the invisibility of Asian Americans' health needs is important, particularly within Asian American communities. How this might be achieved, however, remains an empirical question in light of the vast diversity in the Asian American population. If

perception of a shared reality of the MMS can be created through media (Chao et al., 2013), can media be harnessed to reshape such perceptions? Presenting accurate information about the MMS and others' views of the MMS, particularly by in-group members (Stangor et al., 2001), may help alter a perceived shared reality, although stereotypes are hard to change (Finnegan et al., 2015). In addition, implementation intention planning with specificity of when and how the MMS will be countered cognitively or behaviorally may reduce effects of the MMS (Mendoza et al., 2010).

Strategies from mental health research also might be applied to physical health-related stigma such as increasing social contact (Corrigan et al., 2012; Pettigrew & Tropp, 2006) with Asian Americans coping with physical health conditions. In this era of increased technology use, with frequent use and acceptability in some Asian communities (J. A. Lee et al., 2017; Perrin, 2016), sharing Asian American narratives in video, picture, or e-print may raise awareness about healthy behaviors or chronic conditions. For older adults less familiar with social media or the internet, collaborative education and resource provision in community settings (e.g., Ma et al., 2015) could be effective. Public campaigns and advocacy encouraging supporting family members' and friends' participation in health research for collective well-being may also be fruitful, given that social support and interdependence orientation can facilitate positive preventive health behaviors (Dong & Liu, 2017; Zhao et al., 2014), and lacking social support is a primary barrier to Asian Americans' research participation (George et al., 2014). Another promising direction may be to involve community residents as researchers and disseminators of research with citizen science (King et al., 2019), which could have long-term positive effects for Asian Americans' engagement in social activism and community health.

Conclusion

For far too long Asian Americans' health has been under-examined, at least in part because of the socially crafted MMS contributing to a knowledge disparity in Asian American health. Steps are in progress to move the field of psychology, and health science more generally, in the right direction. Still, substantial progress is needed to demarginalize Asian Americans' unmet health needs, obscured by the MMS.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Public Significance:

The model minority stereotype applied to Asian Americans' health needs to be interrogated and overcome to advance all Asian American populations' health and well-being.

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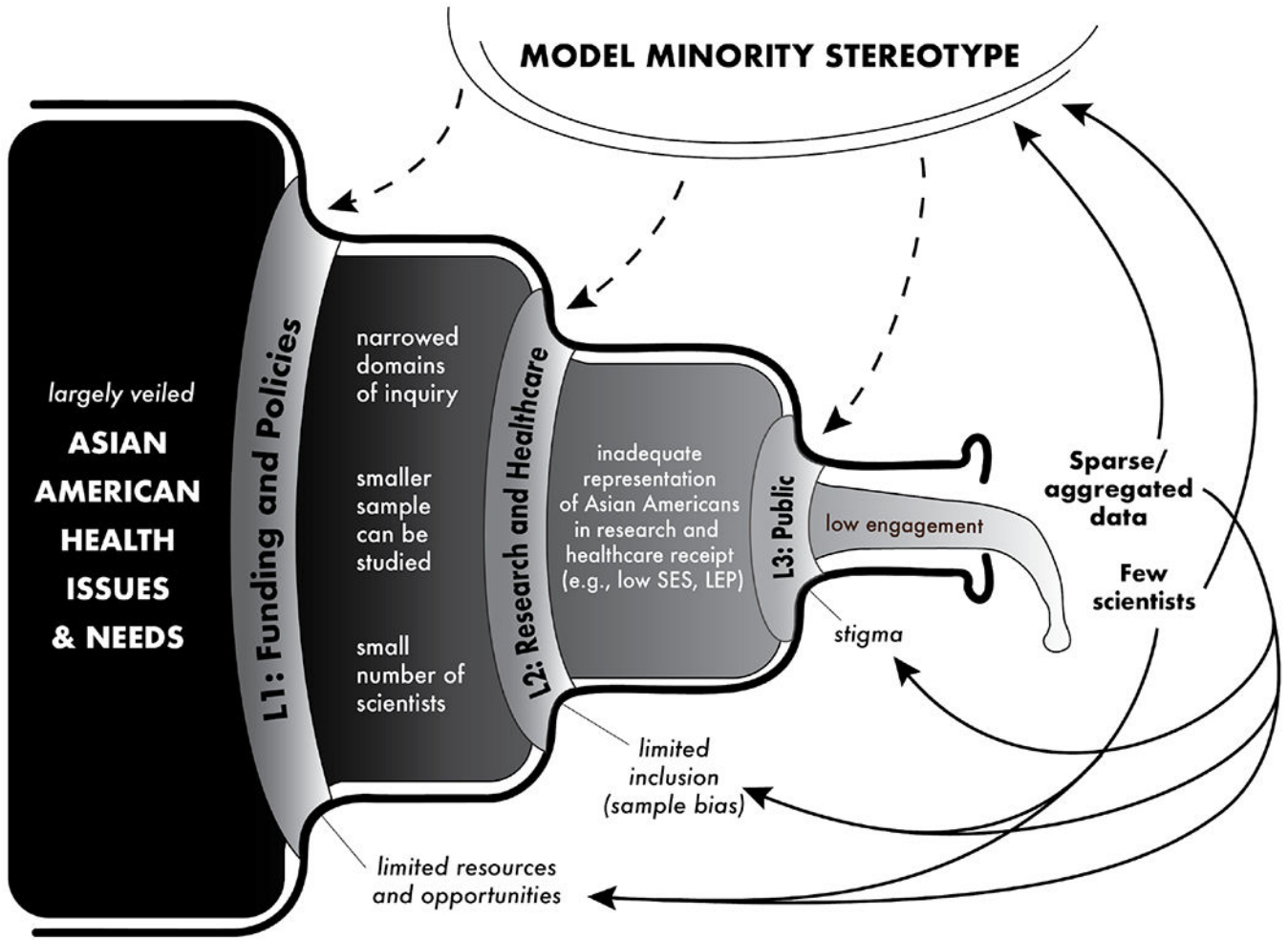


Figure 1. Stereotype-Constraints Model: Flow of Knowledge for Asian American Health Bottlenecked by the Model Minority Stereotype
Note. SES = socioeconomic status, LEP = limited English proficiency

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