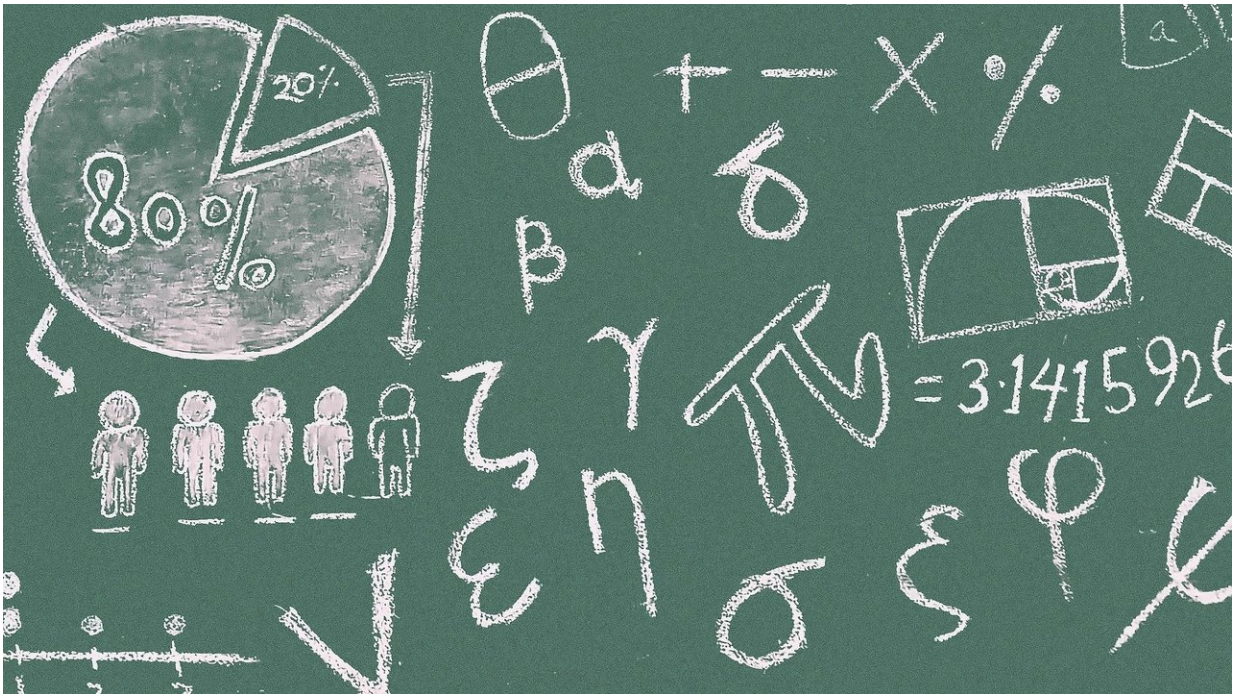# Researcher studies math achievement among Hispanic high school students

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Credit: CC0 Public Domain

A researcher at The University of Texas at San Antonio has co-authored a study examining important cognitive and non-cognitive predictors of entering science, technology, engineering and mathematics (STEM) fields for Hispanic high school students.

Guan Saw, assistant professor of educational psychology in the UTSA

College of Education and Human Development (COEHD), worked alongside Chi-Ning Chang, doctoral student from Texas A&M University, to investigate whether and to what extent [math achievement](#) and motivational factors for Hispanic [high school](#) students differ from that of their White, Black and Asian peers.

"A recent analysis using 2014-2016 American Community Survey Data, provided by the U.S. Census Bureau, showed that while Hispanics accounted for 16% of employed adults ages 25 and older, only 7% of STEM jobs were held by Hispanics, the lowest percentage compared with other racial/ethnic groups. We were aware that there is a critical need to study the distinctive developmental patterns of STEM-related cognitive and non-cognitive factors for Hispanic students in high schools, a crucial life stage with adolescents forming and reshaping their career orientations," said Saw.

In the study, published in the *Hispanic Journal of Behavioral Sciences*, the pair analyzed the nationally representative High School Longitudinal Study of 2009, conducted by the National Center for Education Statistics.

The study traced students' educational trajectories from high school into postsecondary education. It also explored factors at the high school level that could affect STEM participation in college and the workforce.

Saw and Chang studied responses from more than 18,000 Hispanic, White, Black and Asian respondents in early ninth grade and late 11th grade.

The researchers focused on their responses on questions related to [math](#) achievement, values or beliefs that affect behavior and subjective task value (STV). The latter includes inner motivation, perceived usefulness and the personal importance of doing a given task well.

"In this study, to accurately understand the unique patterns for Hispanic students, we used a Hispanic-centric approach, in which we set Hispanic students as a reference group in statistical models, comparing it to Whites, Blacks, and Asians, which yield results that never reported in past literature. Methodologically, it is a novel approach, especially for studies focusing on underrepresented minorities," said Saw.

The researchers observed that Hispanics generally trailed other racial/ethnic groups in math achievement and motivation. According to the study, Hispanic respondents scored lower in math assessment tests than their White and Asian peers in early ninth grade and again at the end of 11th grade. However, Hispanics scored higher on math standardized tests than their Black peers throughout high school.

Taken together with his prior studies, Saw said that middle and high school Hispanic students reported lower levels of math and science self-efficacy than their White, Asian and Black peers, suggesting that how they perceive their ability to do math might affect their decisions and motivations to pursue STEM educational and career opportunities.

The researchers also found that values or beliefs that correlated with math achievement in early high school likewise persisted in late high school for Hispanics significantly more so than for Whites, Blacks and Asians.

"This study will add to the understanding of development patterns of math cognitive and psychosocial factors for Hispanic adolescents, which can be used by educators and policymakers to improve STEM education and workforce preparation, especially among historically underserved and underrepresented students," said Saw.

Saw's research and teaching are informed by his experience as a first-generation college student with three degrees in both STEM and non-

STEM areas completed in three different countries. He aims to pursue research work that can have a societal impact at a local, state, national and international level.

Saw recently received a two-year, $35,000 research grant from the American Educational Research Association (AERA). The grant, funded through the National Science Foundation, will allow him to conduct research focused on STEM education and opportunities in and out of school for women, minorities, first-generation students and students with disabilities.

As a learning and research enterprise, UTSA fosters innovation and creative discovery by channeling its expertise into tackling critical societal issues of today and tomorrow. The UTSA College of Education and Human Development produces educators, administrators, counselors and health professionals with a global perspective of the educational, psychological, social and health needs of communities.

  More information: undefined Barbara Schneider et al. Racial and Ethnic Gaps in Postsecondary Aspirations and Enrollment, *RSF: The Russell Sage Foundation Journal of the Social Sciences* (2017). DOI: 10.7758/RSF.2016.2.5.04

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