

ZEHRA EMINE UNAL

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Palo Alto, CA, 94304

EDUCATION

Ph.D.	University of Missouri, Developmental Psychology Advisors: David C. Geary, Nelson Cowan	2025
M.A.	University of Texas at Austin, Special Education Advisor: Sarah Powell	2019
B.S.	Bogazici University, Mathematics Education Advisor: Serkan Özel	2013

RESEARCH EXPERIENCE

Intern	Stanford University, Psychiatry and Behavioral Sciences Supervisor: Vinod Menon	2023 – 2025
Research Assistant	University of Missouri, Psychological Sciences Principle Investigator: David C. Geary	2019 – 2025
Research Assistant	University of Missouri, Psychological Sciences Principle Investigator: Nelson Cowan	2019 – 2025
Research Assistant	University of Texas (UT) at Austin, Special Education Principle Investigator: Sarah Powell	2018 – 2019
Research Assistant	UT at Austin, Human Development & Family Sciences Principle Investigator: Su Yeong Kim	2018 – 2019

PUBLICATIONS

Ünal, Z. E., Yalvac, B., Terzi, Z. & Geary, D. C. (2024). The relationship between the number line and mathematics achievement: A meta-analysis. *Developmental Science*, 27, e13509. <https://doi.org/10.1111/desc.13509>

Ünal, Z. E., Ala, A. M., Kartal, G., Özel, S. & Geary, D. C. (2024). 9th grade students' conceptual understanding of the number line: A qualitative study. *Journal of Numerical Cognition*, 10, 1-22. <https://doi.org/10.5964/jnc.12501>

Ünal, Z. E., Kartal, G., Ulusoy, S., Ala, A.M., Yılmaz, M.Z. & Geary, D. C. (2023). Relative contributions of g and basic domain-specific mathematics skills to complex mathematics competencies. *Intelligence*, 101, 101797. <https://doi.org/10.1016/j.intell.2023.101797>

Cowan, N., Bao, C., Bishop-Chrzanowski, B. M., Costa, A. N., Greene, N. R., Guitard, D., Li, C., Musich, M. L. & Ünal, Z. E. (2023). The relation between attention and memory. *Annual Review of Psychology*, 75. <https://doi.org/10.1146/annurev-psych-040723-012736>

Ünal, Z. E., Lin X., Greene N. D. & Geary D. C. (2023). What is the source of the correlation between reading and mathematics achievement? Two meta-analytic studies. *Educational Psychology Review*, 35(1), 4. <https://doi.org/10.1007/s10648-023-09717-5>

Geary, Hoard, M. K., Nugent, L. & Ünal, Z. E. (2023). Sex differences in developmental pathways to mathematical competence. *Journal of Educational Psychology*, 115(2), 212–228. <https://doi.org/10.1037/edu0000763>

Geary, D. C., Hoard, M. K., Nugent, L., Ünal, Z. E. & Greene, N. R. (2023). Sex differences and similarities in relations between mathematics achievement, attitudes, and anxiety: A 7th-to-9th grade longitudinal study. *Journal of Educational Psychology*, 115(5), 767–782. <https://doi.org/10.1037/edu0000793>

Ünal, Z. E., Ala, A.M., Kartal, G., Özel, S. & Geary D. C. (2023). Visual and symbolic representations as components of algebraic reasoning. *Journal of Numerical Cognition*. 9(2), 327-345. <https://doi.org/10.5964/jnc.11151>

Ünal, Z. E., Ridgley, L.M., Li, Y., Graves, C., Khatib, L., Robertson, T., Myers, P. & Geary, D. C. The development and initial validation of a mathematics-specific spatial vocabulary scale. (2023). *Frontiers in Education*, 8. <https://doi.org/10.3389/feduc.2023.1189674>

Ünal, Z.E., Forsberg, A., Geary, D. C. & Cowan, N. (2022). The role of domain-general attention and domain-specific processing in working memory in algebraic performance: An experimental approach. *Journal of Experimental Psychology. Learning, Memory, and Cognition*, 48(3), 348–374. <https://doi.org/10.1037/xlm0001117>

Ünal, Z.E., Powell, S. R., Özel, S., Scofield, J. E. & Geary, D. C. (2021). Mathematics vocabulary differentially predicts mathematics achievement in eighth-grade higher-versus lower-achieving students: Comparisons across two countries. *Learning and Individual Differences*, 92, 102061. <https://doi.org/10.1016/j.lindif.2021.102061>

Peng, P., Lin, X., Ünal, Z. E., Lee, K., Namkung, J., Chow, J. & Sales, A. (2020). Examining the mutual relations between language and mathematics: A meta-analysis. *Psychological Bulletin*, 146(7), 595–634. <https://doi.org/10.1037/bu10000231>

Geary, D., Hoard, M. K., Nugent, L., Ünal, Z. E. & Scofield, J. E. (2020). Comorbid learning difficulties in reading and mathematics: The role of intelligence and in-class attentive behavior. *Frontiers in Psychology*, 11, 572099–572099. <https://doi.org/10.3389/fpsyg.2020.572099>

MANUSCRIPTS UNDER REVIEW

Ünal, Z.E., Park, Y., Simsek, E., Menon, V. & Geary, D.C. Neurodevelopmental commonalities in cognitive control networks for mathematics and reading: meta-analytic findings from 3,308 participants.

Tragoudas, G., **Ünal, Z. E.**, Geary, D.C. & Menon, V. Attentional and social problems uniquely predict academic achievement beyond overall psychopathology: multicohort replication in 3800 participants.

Ridgley, L.M., **Ünal, Z. E.**, Li, Y., Graves, C., Khatib, L., Robertson, T., Myers, P. & Geary, D. C. The language of folding: increasing spatial language and decreasing mathematics anxiety through origami.

MANUSCRIPTS IN PROGRESS

Ünal, Z. E., Zhao, C., Oberauer, K., Awh, E. & Cowan, N. (preregistered) The basis of list-length moderation of proactive interference for the recall of object colors.

Ünal, Z.E., Yilmaz, M., Simsek, E., Gable, S., Menon, V. & Geary, D.C. The influence of parental factors on early mathematics performance.

Ünal, Z. E., Forsberg, A., Geary, D. C. & Cowan, N. Modality-independent influences of working memory in word-problem solving: An experimental approach.

Ünal, Z. E., Ala, A.M., Kartal, G., Özel, S. & Geary D. C. 9th grade students' algebraic misconceptions: an international comparative study.

Ünal, Z. E., Ala, A. M., Kartal, G., Özel, S. & Geary, D. C. Students' understanding of variables: a 7th-to-9th grade longitudinal study.

Ünal, Z. E., Kiraz, F., Terzi, Z., Yalvac, B. & Geary, D. C. The role of domain-specific storage and domain-general attentional and executive processing resources in math achievement

JOURNAL REVIEWER

Child Development

Educational Psychology Review

European Journal of Psychology of Education

iScience

Journal of Experimental Psychology: Learning, Memory, and Cognition

TEACHING EXPERIENCE

Teaching Assistant	UT at Austin, Human Development & Family Sciences Course Instructor: Michelann Quimby Course Name: Ethical, Philosophical, and Professional Development Issues (HDF 340)	2019
Teaching Assistant	UT at Austin, Human Development & Family Sciences Course Instructor: Michelann Quimby Course Name: Theories of Child and Family Development (HDF 378L)	2019
Student Teacher	Anderson High School at Austin Teaching subject: Mathematics, Reading, and Social Skills for Students Receiving Special Education	2018
Student Teacher	Casis Elementary School at Austin Teaching subject: Mathematics for Students Receiving Special Education	2018
Tutor	Istanbul, Turkey Tutoring subject: Mathematics	2008 – 2017

AWARDS

Josephine Mitchell Smith Fellowship Psychological Sciences Department University of Missouri (1,040\$)	2021
Graduate Professional Council Psychological Sciences Department University of Missouri (400\$)	2021
Graduate Student Fellowship Department of Special Education UT at Austin (2,700\$)	2019

HONORS & SCHOLARSHIPS

Honors Certificate Boğaziçi University	2013
High School and College Scholarships Turkish Ministry of Education	2004 – 2013