Teresa Girolamo, Ph.D., November 10, 2022
CAREER DEVELOPMENT PLAN

My long-term goal is to become an independently funded principal investigator studying longitudinal outcomes of racially and ethnically minoritized (REM) autistic adolescents and young adults, focusing on language, and translating that knowledge into language supports. Following the identification of gaps and challenges related to my training and experiences, I have identified corresponding research and professional development activities that will be important for attaining my long-term goal. For the two-year duration of the NIH Loan Repayment Program (LRP), I am proposing specific, measurable short-term goals in five areas that will foster my development as an academic researcher.

1) Research: Publications and project completion
In the past year and a half, I completed my Ph.D. at the University of Kansas, obtained a position as a T32 Postdoctoral Trainee in the Cognitive Neuroscience of Communication at the University of Connecticut (UConn), obtained a tenure-track position at an institution that maintains a high level of research activity (San Diego State University [SDSU]), and published nine articles in refereed journals, with an additional four manuscripts under review. In addition, I have completed several studies (e.g., five-year longitudinal data of autistic REM, comparison of morphosyntactic profiles in autistic adolescents with and without language impairment) for which data has been collected and analyzed. Manuscript are in various stages of preparation. I am also designing and implementing an investigation of audiovisual and linguistic processing in autistic REM using passive- and task-based functional near-infrared spectroscopy. With data collection underway, I hope to have pilot data for two manuscripts and three grant applications. Publishing these manuscripts will be critical to achieve my next steps toward my long-term career goal. Therefore, my goal for the two-year duration of the LRP is to submit at least four first-author manuscripts for publication (two of the studies listed above and two related to language in adulthood). I plan to contribute as co-author to at least three additional manuscripts. By achieving these goals, I will hone my skills in terms of analyzing data and identifying the clinical impact of my research to develop innovative projects and advance my programmatic research.

2) Research: New research
For the first year and a half of the LRP award period, I will have a reduced teaching load of one course instead of two courses per semester. This reduced teaching load will allow me to launch funded projects on which I will serve as principal investigator during the LRP award period. One project (also the focus of this proposal) investigates the impact of social determinants of health in young adulthood outcomes of REM autistic young adults with and without language impairment; this project is funded by an American Speech-Language-Hearing Foundation New Investigators Research Grant. The second project will investigate individual differences in audiovisual and linguistic processing at neural levels using naturalistic paradigms in REM autistic individuals varying in language and cognitive abilities. For both projects, I already have the experimental paradigm and research design already in place. My responsibilities as principal investigator will include training and supervising research assistants and a lab manager in data collection, processing, and analysis, and project coordination. I plan to recruit 4 graduate students (3 master's students and 1 doctoral student as a co-advisee, who will also be mentored by a senior academic researcher) to my lab. I will lead the interpretation of findings, reporting results, and writing applications for external funding to support both research directions (see *Professional development: Grant submissions*). I have identified gaps in my experience related to primary data collection, which I aim to address via funding on the LRP. In particular, the processing project, which requires in-person data collection, was delayed by the ongoing COVID-19 pandemic. I have prepared an institutional review board (IRB) application that I will submit at San Diego State University by December 2022 for a study examining measurement of language processing using functional near-infrared spectroscopy. Pilot data has been collected at UConn and will continue at SDSU into spring of 2023. This second line of research is in its earliest stages, but I look forward to applying its findings on the neural mechanisms of language impairment in autism to develop larger-scale, externally funded investigations.

3) Professional development: Scientific meetings and presentations
In the past year, I submitted conference proposals that were accepted by the American Speech-Language-Hearing Association (ASHA) Convention, International Society for Autism Research (INSAR) Annual Meeting, and Symposium on Research in Child Language Disorders (SRCLD). I also have two invited oral sessions at the ASHA Convention on community-based participatory research with REM autistic individuals and healthcare

access (a social determinant of health) for the autistic community. These have been critical pathways for honing my scientific communication skills for diverse audiences, including scientists, clinicians, individuals with communication disorders, and community stakeholders. To continue being an active member of the scientific community, I plan to submit at least two proposals to ASHA, SRCLD, and/or INSAR during each year for the duration of the NIH LRP. I will include undergraduate and/or graduate student researchers on each proposal, and I will actively support additional student-led research projects. I plan to submit proposals to two additional conferences I have not attended before to expand my research network, build new collaborations, and gain insight and opinions from other disciplines. The Society for Functional Near-Infrared Spectroscopy Conference and the Annual Meeting Society for the Neurobiology of Language will be held in fall. In addition to attending and presenting at these meetings, I look forward to pursuing networking opportunities to develop collaborations with colleagues within and outside of my school at San Diego State University (SDSU), including public health, education, and psychology, and faculty at University of California-San Diego, which shares an intercampus doctoral program in language and communicative disorders and a T32 training grant with SDSU.

4) Professional development: Seminars and professional programming

During my doctoral and postdoctoral training, I completed coursework in advanced statistical methods and sought training in multiple areas, such as responsible conduct in research, grant writing, the development of a research career, research mentorship, and inclusive teaching practices. To build upon my scientific and professional skills, I plan to obtain additional research and technical expertise during the LRP award period in five areas. First, I will apply to the ASHA Advancing Academic and Research Careers (AARC) program, which is designed to support early-career clinical scientists in both teaching and research, and to the ASHA Dissemination and Implementation Science Travel Award (DISTAnce), a more targeted program to increase the application of research to practice. Second, I will utilize resources offered by San Diego State University, including programs on grant-writing and seminars on statistical methodology that will help me conduct analyses that may be better suited to low-incidence clinical populations (e.g., Bayesian methods and longitudinal modeling for small samples), ask better research questions of my data, and design more impactful research. Third, as a new principal investigator and lab director, I will build out my student mentorship skills pertaining to responsible conduct of research, encouraging student-led research, and professional development. Fourth, I will take advantage of resources to become an effective instructor by attending programming at the SDSU Center for Teaching & Learning, with the aim of implementing inclusive teaching methodologies in the classroom and creating an environment conducive to co-learning (that is, an environment in which students and teacher learn from one another). Fifth, I will make stay up-to-date on innovations in functional near-infrared spectroscopy methodology (especially for REM) and participatory research methods that will support the engagement of autistic REM and their families, as well as other stakeholders in language and autism research, to better understand adulthood language outcomes and areas in need of support.

5) Professional development: Grant submissions

Expected outcomes of my current research will offer pilot data supporting the feasibility and utility of multimodal assessment to characterize young adulthood outcomes and will inform planning for a larger-scale, externally funded study. During the NIH LRP award period, I will apply to NIH mechanisms to fund my research on social determinants of health and functional near-infrared spectroscopy (i.e., noninvasive neuroimaging and clinical neuroscience): R21 NIDCD Early Career Research awards (planned submissions: June ’23 and February ‘24), DP2 (planned submission: August ’23), and K23 (planned submission: November ‘23). Serving as principal investigator for my current studies, which received small-scale internal and external funding, will support the design and submission of these applications on my pathway to independence. Additional goals for the duration of the LRP award period include applying for foundation funding, including the American Speech-Language-Hearing Foundation New Century Scholars Research Grant and a Brain and Behavior Research Foundation Young Investigators Grant. Finally, I will pursue internal funding mechanisms offered by San Diego State University including the Seed Grant, Grants, Research, and Enterprise Writing (GREW) Fellowship, and will continue to learn about mechanisms through the university’s Research Foundation.

The research and developmental activities outlined in this plan capitalize on my strengths and will address my development needs as an early career clinical scientist. Taken together, the achievement of these short-term goals during the NIH LRP award period will enable me to gain critical skills, knowledge, and experience that will support my transition into an independent investigator.

Teresa Girolamo, Ph.D., November 4, 2022
RESEARCH ENVIRONMENT

Scientific Environment. I am transitioning to an Assistant Professor position in the School of Speech, Language, and Hearing Sciences at San Diego State University (SDSU) in January 2023, which is during the LRP award period. The School of Speech, Language, and Hearing Sciences is housed within the SDSU College of Health and Human Services. The College houses nine interdisciplinary research Centers and Institutes which provide vital training and services to the San Diego region and beyond, and a strong research infrastructure. The faculty of the College have a strong record of extramural grant and contract funding, obtaining $65M in extramural funding during the 2021/22 fiscal year, which was approximately 40% of all extramural funding at SDSU.

The School of Speech, Language, and Hearing Sciences at SDSU and the University of California, San Diego have a unique *intercampus* doctoral training program supported by a T32 grant (Neurocognitive Approaches to Communication Disorders), dedicated to research in language and communicative disorders. This program offers collaboration and training opportunities, with regular programing between lab groups facilitating interdisciplinary work among faculty, trainees, and students. I will also build partnerships for recruitment with the SDSU Center for Autism and Developmental Disorders and the SD Regional Center for Developmental Disabilities. I will also have interdisciplinary opportunities for learning and research collaborations with faculty in public health, education, and psychology, and via the SDSU Center for Clinical and Cognitive Neuroscience.

Laboratory/Office. I will have a dedicated laboratory space with 144 square feet and an office with 108 square feet in the School of Speech, Language, and Hearing Sciences. There are many labs and offices of faculty in related fields and students nearby, facilitating collaboration. In addition, the clinic is on the floor beneath the lab. The laboratory space has space for a NIRSport2 16 x 16 array system, a computer and screen for testing, stimulus and assessment material storage, and locked storage space for participant files. I also have access to meeting room and clinic space for lab meetings and data collection through the School of Speech, Language, and Hearing Sciences. My office and lab space will be equipped with PC and Mac computers, phones for research assistants, and the necessary software for data collection, secure storage of digital data, and data analysis. All equipment for the proposed research will be in place by the beginning of the LRP award period.

The Speech-Language-Hearing Clinic is located within the School of Speech, Language, and Hearing Sciences, which has a waiting room, receptionist area, and dedicated parking. The clinic has multiple rooms for testing and services that are each equipped with an observation room and video recording equipment. The Clinic currently provides services to more than 100 clients with communication disorders, delivering intervention services and conducting weekly evaluations face-to-face and via telehealth, with the potential to recruit through the clinic.

Statistical and Computer Support. The College of Health and Human Services, which houses SLHS, has dedicated IT consultants that offer extensive, state-of-the-art services onsite. There are also data servers that allow for server-based applications and centralized services, web-based data collection software (e.g., Zoom, Qualtrics), and statistical software (e.g., SPSS). IT assistance is also available to support data management and security. SDSU also has a Statistical Consulting Group, which provides advice, project management, data management, and statistical analysis support services to faculty.

Institutional Commitment to Investigator. SDSU provides a highly collaborative environment that is well positioned to support my immediate and long-term research aims. I will have a dedicated research mentor who is the Dr. Sadanand Singh Endowed Professor in Speech and Language Sciences, JoAnn Silkes, and a dedicated teaching mentor, Henrike Blumenfield, within SLHS. I will meet with each of these mentors monthly to discuss logistics of establishing a lab and research program, as well as professional development topics, such as balancing research, teaching, and service. In addition, my development as an independent scientist is supported by the College of Health and Human Services. During the LRP award period, I will have a reduced teaching load of one class instead of two classes per semester. I will also apply for internal mechanisms and foundation grants that permit buy-out of teaching. Moreover, I will have significant start-up funding to support my pathway to independence during the NIH LRP award period, as well as opportunities to take on doctoral students via the SLHS T32 training grant and graduate assistantships.

Teresa Girolamo, Ph.D., November 10, 2022
RESEARCH STATEMENT

OVERVIEW

Over half a million autistic youth will enter adulthood in the next decade and face challenges to living autonomously, with language playing an important role in outcomes.[1-3] Clinical research largely excludes racial/ethnic minoritized (REM) autistic individuals with language impairment (LI),[4-6] who face worse adulthood outcomes and reduced access to social determinants of health.[7,8] Among Medicaid beneficiaries, Black autistic adults are 20-40% more likely than white autistic adults to have psychiatric conditions (e.g., schizophrenia) and physical health conditions (e.g., obesity).[7] In turn, children with LI achieve lower SES in adulthood and are 1.2 times less likely to finish high school and 910 times less likely to complete an undergraduate degree than individuals without LI and individuals with speech impairment.[9] Research also largely ignores the role of relevant factors in outcomes: social determinants of health and linguistic heterogeneity within autistic individuals with LI.[4,10] Autistic individuals with LI interact with others; both individual differences and the local environment shape their ability to build relationships and navigate the community and society.[11] To adequately characterize the transition to adulthood of autistic REM with LI, we must measure the impact of the full spectrum of individual differences and social determinants of health in young adult outcomes.[10]

My long-term goal is to become an independent investigator studying longitudinal outcomes of autistic REM with LI and translating that knowledge into language supports. My short-term goals are to: 1) compare language profiles, with a focus on linguistic difficulties, in autistic individuals with and without LI; 2) test a behavioral assessment protocol to assess both social determinants of health and individual differences in autistic REM with and without LI, and; 3) examine the neural mechanisms underlying language and cognition in REM autistic adolescents and young adults with and without LI. The following research activities will support me in achieving these objectives of my career development plan.

1) Research activities nearing completion

Language phenotypes of autistic REM with LI. Autistic individuals show heterogeneous phenotypes, with significant variability in language and cognitive profiles that is critical to identifying LI.[12] REM and older individuals are underrepresented in autism research,[1,4] limiting the generalizability of extant findings.[1,13] My research focuses on the language profiles of REM autistic adolescents and young adults with LI. In a pilot study, we tested the feasibility of individualized assessment using age-referenced assessments in 10 REM autistic individuals ages 15 to 21 with LI.[14] Findings showed low overall language and the most variability on measures of grammar. My dissertation project examined longitudinal outcomes over 3 years in a sample of 13 REM autistic young adults ages 17 to 23 with LI.[15] Measures of grammar consistently showed the most variability, even after accounting for NVIQ (see Figure 1). Two additional studies are under review (1: examining sociodemographic reporting in LI in autism studies, 2: findings on LI in autism pre- and post-

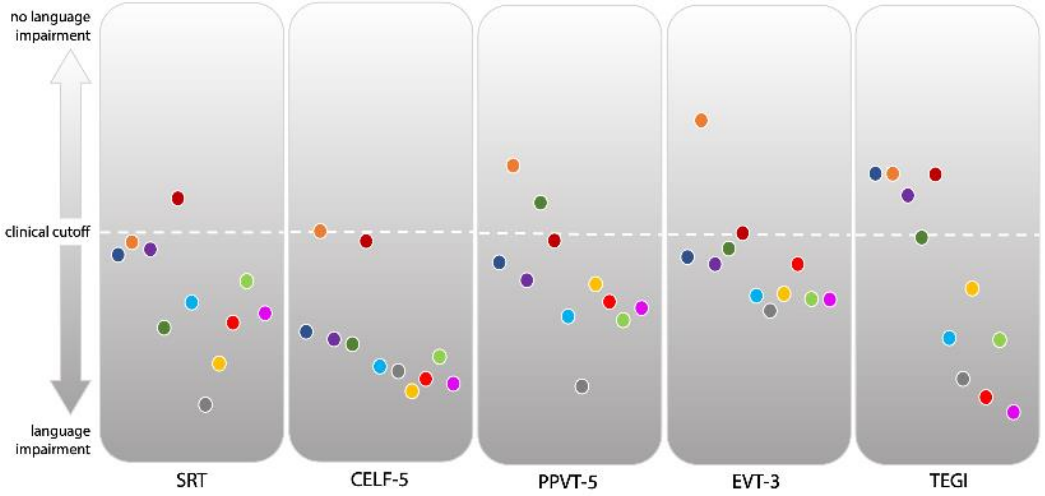

Figure 1. Language profiles by area of assessment: verbal working memory (SRT), overall language (CELF-5), receptive vocabulary (PPVT-5), expressive vocabulary (EVT-3), and grammar (TEGI). Critically, language impairment status using the clinical cutoff for LI (-1.25 SD) varies by assessment. Each color dot represents one individual shown across various assessments.

changes to diagnostic criteria). Results indicate that studies underreport sociodemographics critical to understanding sociocultural variability in autism and use inconsistent criteria for identifying LI. A third paper, for which data have been collected, is in prep, examining detailed linguistic profiles, difficulties, and self-determination (a construct at the interface of individual and environment) in autistic young adults with and without LI. In sum, these findings underscore the importance of careful phenotyping to identify LI in autism. Better assessment and inclusion in research can enable development of more precise language supports.

2) Ongoing research activities

Documenting the role of social determinants in young adulthood outcomes of autistic REM. Building on my interest in characterizing not just the language profiles, but also the outcomes, of REM autistic young adults with LI, as a postdoctoral fellow, I collected novel data on sense of community, access to education and services, and self-determination in this population. Research on LI in autistic individuals has focused almost exclusively on individual differences, such as the extent of LI and cognitive ability, in adult outcomes, excluding the impact of social and organization structures.[10,12] However, epidemiological and autism research highlight the importance of social determinants of health and of focusing on the experiences of autistic individuals in research.[7,16] Thus, assessment ideally addresses factors at three levels (individual, environment, and individual by environment interaction), and employs person-centered measures to assess unmet education and service needs (a pressing concern for autistic young adults),[8] self-determination (i.e., one's perceived ability to set and achieve goals as a causal agent), [16] and sense of community (i.e., a proxy of social capital).[17] Altogether, these factors provide a holistic view on developmental outcomes.

We collected preliminary data from *n* = 8 autistic REM with LI ages 18 to 29 to assess self-determination, sense of community, and access to education and services. These data support the feasibility of these measures with autistic REM with LI. Sense of community was positively associated with daily living skills, controlling for NVIQ and overall language (see Table 1 and Figure 2). Participant and caregiver SDI scores also had nonsignificant correlations (*r* =.676, *p* = .07), consistent with hypotheses.[18] Specific Aims are:

Aim 1. Assess education and services access, sense of community, and self-determination in REM autistic young adults with LI.

Aim 2. Determine the role of education and services access and sense of community in adaptive behavior, self-determination, and autism characteristics of autistic REM young adults with and without LI.

Aim 3. Determine differences in sense of community and education and services access for autistic REM young adults with and without LI, and non-autistic REM age peers.

in the first year of the LRP, this study will collect data from 60 autistic REM with LI and 20 non-autistic age peers. External funding from an American Speech-Language-Hearing Foundation New Investigators Grant will support this study. Results will address the validity of this approach to assessing social determinants of health. In the second year of LRP, I will prepare manuscripts on (1) the effects of social determinants of health and individual differences (i.e., language and NVIQ) on young adult outcomes and (2) self-determination in

Table 1. Pilot Sample Characteristics (*n* = 8).

Measure	*M*	*SD*
SDI mean score	60.5	20.1
BSCS overall mean score	3.0	.70
Needs fulfillment	3.7	1.1
Membership	2.8	1.2
Influence	2.2	0.9
Emotional connection	3.2	0.8
% unmet education & service needs	18.8	11.6
n education & services received	5.3	2.9
% barriers to education/services	51.0	25.0
SRS-2 total *t*-score	67.5	9.8
Social communication *t*-score	67.1	9.4
VABS-3 overall composite score	70.5	5.3
Communication	70.6	6.2
Daily living skills	81.1	11.7
Social skills and relationships	66.5	8.6

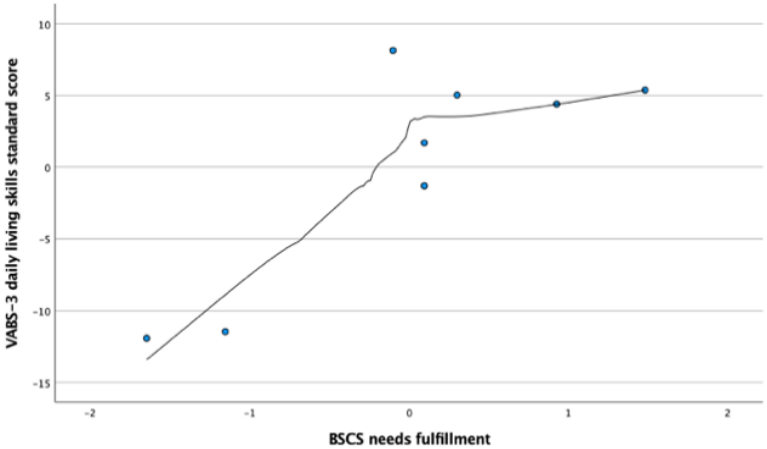

Figure 2. Effect of Brief Sense of Community Scale needs fulfillment on VABS-3 daily living skills controlling for NVIQ & CELF-5 core language with a locally weighted smoothing line fitting 90% of datapoints.

this population. Findings will inform my long-term research activities, and publication represents a critical step toward achieving my short- and long-term goals.

RESEARCH PLANS

Design Methods

This project will evaluate 60 REM autistic young adults with LI and 20 non-autistic REM age peers on overall language, NVIQ, sense of community and access to education and services, and outcomes pertaining to autonomy in terms of adaptive behavior, social communication, and self-determination. All measures are untimed and can be administered remotely.

***Demographics Questionnaire*.** Race and ethnicity, gender, maternal level of education, and diagnoses will be assessed at time of recruitment.

Diagnosis. Autism diagnosis will be confirmed by parent report and via the Autism Diagnostic Observation Schedule-2nd Ed. (ADOS-2; Lord et al., 2012). I have completed clinical ADOS-2 training and am registered to complete ADOS-2 research reliability training in March 2023 (i.e., prior to the start of the LRP award period). The ADOS-2 has two subscales for social affect and repetitive behaviors, with a subscale sum of ≥8 indicating an autism diagnosis. Social communication impairment will be assessed by social communication impairment *t*-scores from the Social Responsiveness Scale-2 parent report (SRS-2; Constantino & Gruber, 2012), a normed measure of autism characteristics for ages ≥4, with high reliability (r = .87-.88). Scores 60 and above indicate clinically significant levels of autism characteristics.

Language skills. This project will use a previously tested comprehensive language assessment protocol in autistic REM young adults with LI that, over the course of three years with repeated measurements, showed variability and was accessible to participants;[15] in addition, this protocol follows epidemiological guidelines for identifying LI in individuals varying in NVIQ.[19] Vocabulary will be assessed by the Peabody Picture Vocabulary Task (PPVT-5; Dunn, 2019) and Expressive Vocabulary Test (EVT-3; Williams, 2019), normed for ages 2;6-≥90 with high reliability (PPVT-5 & EVT-3 r = .97). Overall expressive and receptive language will be assessed by the Clinical Evaluation of Language Fundamentals-5th (CELF-5) Core language scores. The CELF-5 is normed for ages 5-21 and may be used with young adults with LI; it has high reliability (composite scores r = .95-.96; Wiig et al., 2013). The PPVT-5, EVT-3, and CELF-5 all have a M of 100 and SD of 15. Grammatical ability will be assessed by the Test of Early Grammatical Impairment (TEGI), a normed measure that provides outcomes relative to the adult grammar (scale: 0-100), and shows high reliability (r = .95; Rice & Wexler, 2001). Verbal working memory will be assessed by the Syllable Repetition Task, a nonword repetition task normed on ages 4 to 22, which may be used with adults and shows high reliability (r = .85; Shriberg & Lohmeier, 2008).

***Cognitive ability*.** NVIQ will be assessed with the digital long form of the Raven's Progressive Matrices-Second Edition (RPM-2; *Raven's Progressive Matrices–Second Edition: Manual*, 2018), a normed measure for ages 4-≥90 with high reliability (r = .89; M = 100, SD = 15).

Adaptive Behavior. Adaptive behavior will be assessed by the adaptive behavior composite score and subscale scores (communication, daily living, social skills and relationships, internalizing behaviors) from the parent/caregiver form of the *Vineland Adaptive Behavior Scales-3rd Ed.* (VABS-3), a normed measure for ages 0-≥90 with high reliability (r = .93-.97). Composite and subscale scores except for internalizing behaviors have a M of 100 and SD of 15; internalizing behaviors *v* scale scores have a M of 15 and a SD of 3.

Self-Determination Inventory. Self-determination will be assessed by the *Self-Determination Inventory* (SDI), a questionnaire validated for ages 13-adulthood with high reliability (α = .78).[20] The SDI has 21 statements related to self-determination. It will be administered as an interview with supports, in a method piloted by the PI along with a team including REM neurodiverse self-advocates and parents of autistic children. It employs a series of questions that enhance accessibility by scaffolding respondents into thinking about each item, and to gauge cultural sensitivity of the items. For example, in response to "I consider many different possibilities when

I make plans for my future," respondents will talk about what "possibilities" mean, where they see themselves in the future, and how they plan for their future (i.e., on their own or as a family) before responding to a visual scale (0-100; higher scores indicate higher self-determination).

Sense of Community. Sense of community will be assessed by the *Brief Sense of Community Scale* (BSCS), a validated measure for REM youth with high reliability for (α = .85).[21] The BSCS has eight statements, which respondents rate on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate a higher sense of community. The measure yields an overall score as well as subscale scores for needs fulfillment, membership, influence, and emotional connection. Analyses will use each of these scores.

Education and Services Questionnaire. Access to education and services will be assessed by the *Education and Services Questionnaire*, adapted from the National Longitudinal Transition Survey and prior work with REM autistic young adults.[8] Respondents indicate whether they receive and require each of 16 different education supports and services, rate, and describe 12 potential barriers (e.g., cost of services) to accessing education and services.

General Procedures

Sample. Participants will be 60 REM autistic young adults with LI and 20 REM non-autistic age peers of all genders and sexes (see *Power Analysis*). The proposed studies build on a unique community partnership, involving five years of data collection to date, with the [organization name] (*potential n* = 200), as well as partnerships with REM community stakeholders (*projected n* = 50) and the [organization name] (*potential n* = 50). Recruitment will also draw from the [lab name] (PI: [name]) at the [university name] (*potential n* = 50). Based on the PI's prior success in recruiting,[28] we expect to achieve the target sample size without issue.

Selection Criteria. Eligibility for the study will be: (a) REM; (b) age 14-31 (i.e, when transition planning begins and 10 years after exiting public education); (c) formal autism diagnosis, per parent report and to be confirmed via the CARS-2; (c) proficiency in General American English; (d) LI as defined by scores of -1.5 *SD* on two or more language measures (PPVT-5, EVT-3, TEGI, SRT, CELF-5). This rigorous inclusion approach follows epidemiological studies of LI and autism.[19] Based on prior longitudinal data,[15] participants are expected to show impairment in some domains but not others, suggesting subgroups varying in receptive-expressive profiles. We recognize it may be difficult to obtain equal samples varying in receptive-expressive and expressive-receptive asymmetries. Given the timeframe of this proposal, we will use CELF-5 receptive-expressive difference scores variable to characterize linguistic profiles and in exploratory analyses (see *Potential Problems*). Eligibility for the non-autistic comparison group will be: (a) REM; (b) age 14-30; (c) no diagnoses or history or developmental delays; (d) proficient in General American English.

Screening. Participants will be screened using a detailed questionnaire and observations from assessment. Exclusion criteria will be: Deafness or uncorrected vision impairment that could hinder performance; nonverbal language status per caregiver report; severe apraxia of speech or a speech sound disorder, per the SRT and the TEGI phonological probe; and lack of proficiency in General American English from analysis, to avoid confounds with language background.

Assessment. Participants will complete testing in one to two (remote) sessions, with breaks as needed, within one week; see Table 2. Caregivers will complete the SRS-2, VABS-3, and Self-Determination Inventory, and may help their child in responding to the Brief Sense of Community Scale and Education and Services Questionnaire as needed. Respondents will complete the Brief Sense of Community Scale, Education and Services Questionnaire, ADOS-2, VABS-3, and Self-Determination Inventory as interviews to reduce risk of bias from

Table 2. Assessments.

Demographic Questionnaire
Syllable Repetition Task
Clinical Eval. of Language Fund.-5th Ed.
Peabody Picture Vocabulary Test-5th
Expressive Vocabulary Test-3rd Ed.
Raven's Progressive Matrices-2nd Ed.
Test of Early Grammatical Impairment
Self-Determination Inventory – self
Brief Sense of Community Scale
Education & Services Access Survey
Social Responsiveness Scale-2nd Ed.
Vineland Adaptive Behavior Scales-3rd Ed.
Autism Diagnostic Observation Sc.-2nd Ed.
Self-Determination Inventory – caregiver

difference in examiner or inaccessibility of measures. Except for the ADOS-2, this protocol was previously tested in three-hourlong sessions; see *Table 1* and *Figure 1*).[15]
Administering the ADOS-2 online is feasible for this population.[22]

***Equipment*.** Behavioral assessments will be conducted via HIPAA-compliant videoconferencing software (Zoom for Healthcare). Participants will use a tablet or computer with internet access in a quiet place to listen to, view, and respond to stimuli verbally, by pressing a mouse, or by touching a screen.

***Pilot Data*.** I obtained pilot data from 8 REM autistic young adults with LI (age 18-29; 1 female, 7 male; CELF-5 core language: $M = 58.4$, $SD = 5.2$; RPM-2 NVIQ: $M = 80.6$, $SD = 5.2$) who met the selection criteria (see *Table 1* and *Figure 1*). The young adults completed the Brief Sense of Community Scale, Education and Services Questionnaire, and Self-Determination Inventory as interviews versus online or pencil-and-paper questionnaires. These data provide proof of concept that these measures were feasible for this population when administered as interviews.

Participants showed variable outcomes on the Brief Sense of Community Scale, Education and Services Questionnaire, and Self-Determination Inventory; see Table 1. Participants were unlikely to report high percentages of unmet education and service needs yet reported encountering over 6 of 12 possible (>50%) barriers in accessing education and services to meet their needs. Brief Sense of Community Scale scores were variable, with needs fulfillment scores were associated with higher VABS-3 Daily Living Skills standard scores, controlling for RPM-2 NVIQ and CELF-5 core language standard scores (see *Figure 2*). Last, participants showed heterogeneity on the Self-Determination Inventory, with some participants reported near-ceiling Self-Determination Inventory scores (i.e., 99), while others reported much lower mean SDI (i.e., 39). Though it was expected that there would be effects of unmet education and services needs on VABS-3 adaptive behavior composite and subscale scores, Self-Determination Inventory average scores, and SRS-2 social communication impairment *t*-scores, the effects were not significant. Similarly, there were no effects of Brief Sense of Community Scale scores other than the needs fulfillment score on outcome measures. However, because the pilot data support the feasibility and informativeness of these measures, this project will further explore these differences by recruiting a larger sample and adding a comparison group.

Analyses

Aim 1: Assess education and services access, sense of community, and self-determination to in REM autistic young adults with LI. Most studies on education and services access, sense of community, and self-determination only include non-autistic individuals or provide broad measures of characteristics (e.g., diagnosis of ASD) that are insufficient for generalizing to specific populations.[23,24] Although evidence indicates REM autistic young adults with LI have different experiences than REM non-autistic young adults and individuals without LI, there are no empirically established metrics for these individuals. This Aim will further our understanding and documentation of these factors in REM autistic young adults with LI. This Aim uses two phases of activity to recruit participants and to collect and analyze data. It is expected that raw scores will show a positively skewed distribution.

Aim 2: Determine the role of education and services access and sense of community in adaptive behavior, self-determination, and social communication impairment above and beyond overall language ability, NVIQ, and autism status. Prior work on the role of social determinants of health in outcomes tends to consider the general population. While these environmental factors are highly relevant to understanding outcomes, there are no empirical studies of REM autistic young adults with LI.[10] It is expected education and services access and sense of community will positively predict adaptive behavior and self-determination, and negatively predict social communication impairment, controlling for overall language ability and NVIQ.

Aim 3: Probe for group differences in autistic and non-autistic young adults in sense of community and education and services access. Autistic REM show reduced access to education and services relative to white autistic age peers prior to exiting high school.[8] Similarly, REM and white adolescents differ in their sense of community, with higher social capital associating with higher sense of community.[25,26] Therefore, it is expected that autistic REM with LI will show reduced sense of community and access to education and

services than non-autistic young adults, controlling for overall language ability and NVIQ.

Power Analysis. An *a priori* power analysis in G*Power indicated that a sample size of 68 with four total predictors and two tested predictors in a multiple linear regression would achieve >80% power, with an alpha of .05 and a medium effect size (**Aim 2)**. An *a priori* power analysis in G*Power indicated that a sample size of 68 with two groups and two response variables in a multivariate analysis of variance will achieve >80% power, with an alpha of .05 and a medium effect size (**Aim 3**).

Potential Problems. One potential issue is recruiting a sample of primarily males, which would limit generalizability of findings. This project will leverage community partnerships to recruit samples representative of the estimated male-to-female prevalence in the U.S. (i.e., 4.2). To account for heterogeneity in REM autistic young adults with LI, we will match them to non-autistic age peers on as many characteristics as possible (e.g., race/ethnicity, chronological age, NVIQ). We will also run exploratory analyses for groups differing in linguistic profile, as determined by significant differences on CELF-5 expressive and receptive language index scores. Finally, individuals who have exited public education versus those still in school might differ in Education and Services Questionnaire responses. Though we will inspect responses for differences, this should not be a confounding variable, as unmet education and service needs and barriers to education and services are expected to remain constant across ages. REM autistic adolescents report experiencing disproportionate unmet education and service needs while still in school, [8] and REM without disabilities are not expected to have changes in unmet service needs during or after exiting secondary education.

Planned Data Analyses. Prior to analysis, all variables will be examined for assumptions of multicollinearity, heteroscedasticity, and normality. Non-normally distributed variables will be transformed depending on their distribution, and missing data will be excluded. In exploratory analyses of sub-groups varying in linguistic profiles (i.e., stronger expressive than receptive vs. stronger receptive than expressive language), missing data will be imputed using predictive mean matching or multiple imputation with predictive mean matching, depending on the quantity and type of missing data (i.e., how well the algorithm can find a "match").[35]

Aim 1. This Aim will examine unmet education and service needs and barriers to education and services using the Education and Services Questionnaire, sense of community using the Brief Sense of Community Scale, and self-determination using the Self-Determination Inventory, within the REM autistic young adults with LI sample. If there is sufficient gender diversity, we will analyze groups separately. Unmet education and service needs and barriers outcome measures will be calculated as number and percentages. Sense of community outcome measures will be calculated as total and domain scores (needs fulfillment, membership, influence, emotional calculation). Self-determination scores will be calculated at the average Self-Determination Inventory Score. All variables will be examined for assumptions of multicollinearity, heteroscedasticity and normality. Missing data will be excluded.

Aim 2. Multiple linear regression analyses will test the hypothesis that access to education and services and sense of community positively predict adaptive behavior and self-determination, and negatively predict social communication impairment, controlling for overall language ability and NVIQ. VABS-3 adaptive behavior composite scores will be regressed on Brief Sense of Community Scale mean scores and Education and Services Questionnaire unmet education and service needs with CELF-5 core language scores and RPM-2 NVIQ standard scores as covariates. Subsequent analyses will examine other dependent variables. Specifically, subsequent regression analyses will replace Education and Services Questionnaire unmet education and service needs with Education and Services Questionnaire barriers to education and services and Brief Sense of Community Scale mean scores with subscale scores for needs fulfillment, membership, influence, and emotional connection. Subsequent analyses will also examine other independent variables and replace VABS-3 adaptive behavior composite scores with each of the subscale scores (VABS-3 communication, daily living, and social skills), mean Self-Determination Inventory scores, and Social Reponsiveness-2nd Ed. (SRS-2) social communication impairment *t*-scores.

Aim 3. Multivariate analysis of variance will test whether REM autistic young adults with LI and non-autistic REM age peers differ in their sense of community and access to education and services. Specific variables for group comparison will be Brief Sense of Community Scale mean scores and Education and Services

Questionnaire unmet education and service needs. Subsequent analyses will replace Brief Sense of Community Scale mean scores with subscale scores for needs fulfillment, membership, influence, and emotional connection subscale scores, as well as Education and Services Questionnaire unmet education and service needs with Education and Services Questionnaire barriers to education and services.

SUMMARY

This proposed research is in an early stage, but I look forward to continued investigation into social determinants of health and mechanisms underlying language development that may lead to greater understanding of the multivariate influences in outcomes of REM autistic individuals. This work will provide crucial preliminary data for larger grant proposals. LRP funding will support the continued development of my research career and will be invaluable as I work to establish myself as an independent researcher and competitive applicant for R21 NIDCD Early Career Research, NIDCD K23, and DP2 awards to fund my programmatic research on social determinants of health and the neural correlates of language impairment in autistic REM. These activities will lead to the attainment of my long-term goal. I am well equipped to begin an independent research program to address important questions relevant to advancing understanding of variability of language in autistic individuals and the constellation of factors in developmental outcomes, with the ultimate aim of improving outcomes for autistic individuals and individuals with communication disorders.

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BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Girolamo, Teresa

eRA COMMONS USER NAME (credential, e.g., agency login): tgirolamo

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
Kenyon College, Gambier, OH	BA	05/2008	Chinese & Spanish
University of Washington, Seattle, WA	MA	06/2011	International Studies
Pace University, Manhattan, NY	MSED	08/2013	Special education
University of Kansas, Lawrence, KS	PHD	05/2021	Child Language
University of Connecticut, Storrs, CT	NIH training grant	07/2023	Cognitive Neuroscience of Communication

A. Personal Statement

My practitioner and mentorship experience, funding, and publication record demonstrate my ability to successfully complete the proposed project as part of sustained research activity. Completing this project will help me build a career as a clinical scientist, as well as acquire external funding for larger grant proposals (R21, DP2, and K23). I have a background as a former special education teacher and researcher, including working with racially and ethnically minoritized (REM) autistic adolescents and young adults with language impairment, and individuals of all ages with developmental language disorders more broadly. I have scientific expertise examining variability in the linguistic skills of autistic and non-autistic REM with language impairment. My dissertation research was funded by a Research Excellence Initiative Grant from the University of Kansas and involved longitudinal behavioral assessment of autistic REM with language impairment. I overcame challenges of data collection during the COVID-19 pandemic by developing and implementing an online assessment protocol that allowed me collect longitudinal data from autistic REM with language impairment. I used this protocol to carry out my dissertation project independently from my lab, building an eight-year ongoing community partnership with an organization serving over 700 primarily REM autistic individuals. My postdoctoral research was funded by a Cognitive Neuroscience of Communication T32 fellowship at the University of Connecticut, which allowed me to build upon my previous training and independent research by building two lines of research into investigation of language and outcomes of autistic individuals with language impairments. One line involves environmental influences in young adult outcomes, and another line involves examining the neural circuity of language impairments using functional near-infrared spectroscopy. Altogether, my efforts as a postdoctoral trainee led to success in obtaining funding (see below), six first-authored and three co-authored refereed articles, and building three new community partnerships with organizations serving primarily REM autistic individuals, two of which are nationwide and one of which is specific to the Southern California area.

As an incoming Assistant Professor in the School of Speech, Language, and Hearing Sciences, at San Diego State University, the proposed project builds upon my prior work as a Postdoctoral Trainee. My project will examine environmental factors in young adult outcomes using community-based participatory methods. I will examine social determinants of health, namely access to education and services and sense of community, in young adulthood outcomes of autistic REM with language impairment and non-autistic age peers. I will leverage my community partnerships to recruit a sample of REM participants, who are systematically excluded from autism, language, and clinical neuroscience research. I am ideally equipped to complete this project while maintaining a high level of research productivity. I have a reduced teaching load during at least 1.5 years of the loan repayment period of one course instead of two courses per semester; this time will allow me to focus on

the proposed project. In addition, as a former special education teacher who completed a master's degree while teaching full-time, actively assisted with end-of-life care for a parent with pancreatic cancer, and trained for marathons and ultra-marathons, I have developed the resilience, time management, and persistence to carry out the proposed project. Finally, as a racially and ethnically minoritized individual with a clinical diagnosis of autism spectrum disorder, I fully understand the ways in which clinical research with autistic REM must be sensitive to individual identities in terms of both cultural and linguistic diversity and disability.

Ongoing projects that I would like to highlight include:

New Investigators Research Grant ($10,000), American Speech-Language-Hearing Foundation
Girolamo (PI)
12/1/22-12/1/23
Social determinants of health in young adulthood outcomes of autistic BIPOC with language impairment

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

2023 -	Assistant Professor, School of Speech, Language, and Hearing Sciences, San Diego State University
2022-	Affiliate, Connecticut Institute for the Brain and Cognitive Sciences, Storrs, CT
2021 - 2023	NIH Postdoctoral Trainee (T32 DC017703), University of Connecticut, Storrs, CT
2018 - 2018	Graduate Teaching Assistant, University of Kansas, Lawrence, KS
2017 - 2021	Graduate Research Assistant (R01 DC001803), University of Kansas, Lawrence, KS
2014 - 2017	NIH Predoctoral trainee (T32 DC000052), University of Kansas, Lawrence, KS

Honors

2022	Early Career Diversity Award, International Society for Autism Research
2022	Student Travel Award, Symposium on Research in Child Language Disorders
2022	Lessons for Success Awardee, American Speech-Language-Hearing Association
2021	Graduate Student Award for Distinguished Service, University of Kansas
2021	Research Mentoring-Pair Travel Award, American Speech-Language-Hearing Association
2021	Grant, National Military Family Association
2021	Pathways Protégé, American Speech-Language-Hearing Association
2020	Student/Trainee Workshop Award, International Society for Autism Research
2020	Jayhawks Rising Student Award, University of Kansas
2019	Student Travel Award, Symposium on Research in Child Language Disorders
2019	Graduate Student Scholarly Travel Fund, University of Kansas
2019	Student/Trainee Workshop Award, International Society for Autism Research
2019	Tradition of Excellence Award, University of Kansas Endowment Association
2018	Student/Trainee Award, International Society for Autism Research
2018	Graduate Scholarly Presentation Travel Fund Award, University of Kansas
2017	Graduate Student Travel Award, University of Kansas
2017	Student Travel Award, Symposium on Research in Child Language Disorders
2017	Research Mentoring-Pair Travel Award, American Speech-Language-Hearing Association
2016	Schiefelbusch Child Language Scholarship, University of Kansas
2016	Student Research Travel Award, American Speech-Language-Hearing Association
2016	New Century Scholars Graduate Student Scholarship, American Speech-Language-Hearing Foundation
2015	Minority Student Leadership Program, American Speech-Language-Hearing Association
2011 - 2013	Segal AmeriCorps Education Award, Americorps
2010 - 2011	Department of Education Foreign Language and Area Studies Fellowship, University of Washington
2010 - 2010	Graduate Student Scholarship, University of Washington Center for Korea Studies

2004 - 2008 Kenyon Merit Grant, Kenyon College

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/myncbi/teresa.g.1/bibliography/public/

C. Contribution to Science

1. **Evaluation of Language Impairment:** My early career contributions focused on how speech-language pathologists and teachers make clinical and educational decisions for children with specific language impairment (SLI), also known as developmental language disorder (DLD). Though SLI/DLD is characterized by well-known clinical markers (e.g., difficulties with complex syntax), children with these disorders are under-identified in the educational system. To understand factors in under-identification, I developed a novel survey on teacher educational decision-making practices for children with SLI. I also collaborated on the development of a parallel survey questionnaire on the clinical decision-making practices of speech-language pathologists for children with SLI, with a broader aim of understanding how individual differences in practitioner knowledge, skills, and attitudes interact with environmental constraints (e.g., workplace eligibility criteria) to inform decision-making. Results from this research provided new information on how, even with direct behavioral assessment scores and practitioners perceiving that children with SLI have difficulties in the classroom, their decision-making practices may not align to the children's language needs. Findings also underline a need to develop robust markers of language impairment beyond behavioral assessment alone.

    a. **Girolamo TM**, Rice ML, Selin CM, Wang CJ. Teacher educational decision making for children with specific language impairment. *Am J Speech Lang Pathol*. 2022 May 10;31(3):1221-1243. PubMed PMID: 35235411.
    b. Selin CM, Rice ML, **Girolamo TM**, Wang CJ. Work setting effects on speech-language pathology practice: Implications for identification of children with specific language impairment. *Am J Speech Lang Pathol*. 2022 Mar 10;31(2):854-880. PubMed Central PMCID: PMC9150684.
    c. Selin CM, Rice ML, **Girolamo T,** Wang CJ. Speech-language pathologists' clinical decision making for children with specific language impairment. *Lang Speech Hear Serv Sch*. 2019 Apr 23;50(2):283-307. PubMed Central PMCID: PMC6802870.

2. **Equity in Science:** A critical arm of my work is equity in science, by working with diverse participant samples in my own research and also by helping build diversity in the field. To this end, I developed a line of research on systemic barriers to equity, as well as effective strategies to remove those barriers. I co-authored two publications, one establishing how to test for linguistic bias in academic writing and one reporting how reviewers from communication science and disorders evaluate the scientific writing of authors who learned English as an additional language (i.e., EAL). We found respondents rated abstracts of equally strong scientific quality lower when authors were EAL writers versus authors with English as a first language. I expanded on this work in a study investigating how faculty and Ph.D. candidates evaluate applicants to master’s programs in speech-language pathology using criteria from a holistic review process. Results showed that applicants from stereotypically high-achieving backgrounds received the highest ratings and were the most likely to receive an “accept” decision. This research has implications for understanding how to diversify science. I translated findings from these studies into a project that aimed to remove systemic barriers to academic, clinical, and research success, serving racially and ethnically minoritized students in CSD. This project resulted in institutional policy change and individual outcomes (e.g., grants, fellowships), a publication on this student-led initiative, and a forthcoming publication on best open science practices for research with minoritized communities.

    a. **Girolamo TM**, Politzer-Ahles S, Ghali S, Williams BT. Preliminary evaluation of applicants to master's programs in speech-language pathology using vignettes and criteria from a holistic review process. *Am J Speech Lang Pathol*. 2022 Mar 10;31(2):552-577. PubMed Central PMCID: PMC9150675.
    b. **Girolamo TM**, Ghali S. Developing, implementing, and learning from a student-ked initiative to support minority students in communication sciences and disorders. *Perspect ASHA Spec Interest Groups*. 2021 Aug;6(4):768-777. PubMed Central PMCID: PMC8415799.

c. Politzer-Ahles S, **Girolamo T**, Ghali S. Preliminary evidence of linguistic bias in academic reviewing. *J Engl Acad Purp*. 2020 Sep;47 PubMed Central PMCID: PMC7575202.

d. Politzer-Ahles S, Holliday JJ, **Girolamo T**, Spychalska M, Berkson KH. Is linguistic injustice a myth? A response to Hyland (2016). *J Second Lang Writ*. 2016 Dec;34:3-8. PubMed Central PMCID: PMC5502761.

3. **Language in Racially and Ethnically Minoritized Autistic Young Adults with Language Impairment:** My primary research focus is on the linguistic skills of racially and ethnically minoritized (REM) autistic young adults and how language relates to life outcomes (e.g., adaptive behavior). Though autistic young adults overall face significant challenges in the transition to adulthood, REM face worse outcomes compared to white autistic peers. In addition, while language plays an important role in childhood outcomes, information on adult outcomes and appropriate assessment methods for REM autistic young adults is limited. To address this gap, I recruited REM autistic young adults with language impairment. My pilot study demonstrated the feasibility of using age-referenced assessments with this community and led to a publication, which was a featured article in a newsletter for the American Speech-Language-Hearing Association, reaching over 215,000 members (Girolamo et al., 2020). This line of research was the focus of my dissertation, for which I developed a remote assessment protocol during the COVID-19 pandemic. This study provides fine-grained data on the language abilities and life outcomes of REM autistic young adults with language impairment. I have now worked with this community for over eight years, resulting in an additional first-author publication providing "proof of concept" for identifying language impairment in this population using longitudinal data and three manuscripts under review on research engagement strategies, sociodemographic reporting in language in autism studies, and findings on language impairment in autism. I expanded on this work by proposing a pathway for fair and equitable interpretation and use of direct behavioral assessment scores, bringing together theory from sociology and psychometrics in a recent publication. Ultimately, this line of research will illuminate the “hot-spot” support needs and highlight potentially useful directions for understanding the impact of language skills in autistic individuals with LI in real-world outcomes.

a. **Girolamo T**, Rice ML. Language impairment in autistic adolescents and young adults. *J Speech Lang Hear Res*. 2022 Sep 12;65(9):3518-3530. PubMed PMID: 36067514.

b. **Girolamo T**, Ghali S, Campos I, Ford A. Interpretation and use of standardized language assessments for diverse school-age individuals. *Perspect ASHA Spec Interest Groups*. 2022 Aug;7(4):981-994. PubMed Central PMCID: PMC9467289.

c. **Girolamo TM**, Rice ML, Warren SF. Assessment of language abilities in minority adolescents and young adults with autism spectrum disorder and extensive special education needs: A pilot study. *Am J Speech Lang Pathol*. 2020 May 8;29(2):804-818. PubMed Central PMCID: PMC7842863.

Other Manuscripts

d. **Girolamo T**, Shen L, Gulrick AM, Rice ML, Eigsti IM. Language impairment in autistic individuals: A systematic review. (under review).

4. **Neural Circuity of Language Impairment in Racially and Ethnically Minoritized Autistic Young Adults:** As a postdoctoral trainee, my research expanded beyond direct behavioral assessment into direct probes of neural processing using functional near-infrared spectroscopy (fNIRS). Previous studies have shown that fNIRS is a feasible and informative methodology to investigate language abilities in individuals with speech/language impairment. However, neuroimaging research (EEG, fMRI, fNIRS) systematically excludes REM, with potentially greater exclusion of autistic REM with language impairment. My co-authors and I proposed a pathway for understanding, and importantly, mitigating, this exclusion (Girolamo et al., 2022). In addition, in a manuscript under review, we found that fNIRS studies of speech/language impairment systematically underreport and exclude REM (Girolamo et al., under review). These threads inform my current and future work, which is focused on using fNIRS to understand inter- and intra-group variability in brain functional connectivity in autistic BIPOC with and without LI, as well as top-down, environmental factors in outcomes. In this area of research, I received training from one of the world's foremost experts in fNIRS, Richard Aslin, and Inge-Marie Eigsti, who is an expert in language in autism and use of neuroimaging methods with autistic individuals.

a. **Girolamo T**, Parker TC, Eigsti IM. Incorporating Dis/ability Studies and Critical Race Theory to combat systematic exclusion of Black, Indigenous, and People of Color in clinical neuroscience. *Frontiers in Neuroscience*. 2022 September 08. DOI: 10.3389/fnins.2022.988092

Other Manuscripts

b. **Girolamo T**, Butler L, Canale, R, Aslin, RN, Eigsti, IM. fNIRS studies of individuals with speech and language impairment underreport participant sociodemographics: A systematic review. (under review).

Teresa Girolamo, Ph.D., November 10, 2022
PERSONAL STATEMENT

During my undergraduate and graduate studies, research examining the interface of culture and linguistics eventually spurred me to pursue a doctoral degree in Child Language at the University of Kansas in 2021 (KU). My academic research career began when I was a special education teacher serving racially and ethnically minoritized (REM) autistic adolescents who were minimally verbal in a public-school setting. Over several years, I taught full-time while completing a master's degree in teaching. I noticed that students like the ones I taught were scarce in the research literature, limiting our ability to meet their language needs. To address this gap, I took advantage of every opportunity, attending conferences and collaborating with speech-language pathologists. Expanding upon these interests, mentors in education and academia encouraged me to pursue a doctorate. Teaching autistic students led to a specific interest in language phenotypes in REM autistic individuals with language impairment. As a researcher, I aim to carry out studies with clinical impact. My proposed LRP research aligns to NIH REACH, addressing NIDCD Priority Areas (2) Understanding Diseases and Disorders: Co-Occurring Conditions; (3) Improving Diagnosis, Treatment, and Prevention: Understudied Populations; (4) Improving Outcomes for Human Communication: Community-Based Research.

During my doctoral training at KU, I pursued research training via a T32 Predoctoral Traineeship in Language Impairments and participated in multiple NIDCD-funded grants exploring longitudinal trajectories of language in individuals with language impairment and novel mobile health technology approaches to screening individuals for language impairment. I also developed independent research by building an eight-year ongoing community partnership with an organization serving REM autistic individuals, collecting longitudinal behavioral data to examine behavioral phenotypes in this population during the transition to adulthood. I successfully obtained two Research Excellence Initiative Grants and multiple awards for travel and research to support my work. I also secured external funding from an American Speech-Language-Hearing Foundation Graduate Student Grant. Upon completion of my doctoral studies, I extended my skillset as a T32 Postdoctoral Trainee in the Cognitive Neuroscience of Communication, learning to use functional near-infrared spectroscopy (fNIRS) to investigate the neural correlates of audiovisual and linguistic processing in REM autistic individuals with language impairment. I also developed novel community partnerships with the Northeast Alliance for Speech, Language, and Hearing (a chapter of the National Black Association for Speech-Language-Hearing) and the Orange County Autism Foundation, which I anticipate will facilitate recruitment of REM participants.

My long-term goal is to become an independently funded principal investigator studying longitudinal language outcomes of REM autistic adolescents and young adults with language impairment and translating that knowledge into language supports. My short-term goals are to: 1) compare language profiles in autistic individuals with and without LI; 2) test a behavioral assessment protocol to assess both social determinants of health and individual differences in autistic REM with and without LI, and; 3) examine the neural mechanisms underlying language and cognition in REM autistic adolescents and young adults with and without LI. I have begun to contribute to science in areas that include the evaluation of individuals with language impairment, equity in science, language impairment in autistic REM, and the use of fNIRS with autistic REM. My work has resulted in 15 publications (nine first-authored), and I have presented over 30 talks and posters at national and international conferences. Four first-author and one co-authored manuscripts are under review, and an additional four are in preparation. Finally, I serve as a reviewer for national and international journals and conferences, a Diversity Committee member of the Council for Academic Programs in Communication Sciences and Disorders, and a mentor of over 16 REM undergraduate and graduate students.

I received an American Speech-Language-Hearing Foundation Grant to fund the proposed study during the LRP award period on the effects of social determinants of health on young adulthood outcomes of REM autistic individuals. Expected outcomes will inform linguistic variability in this population, with the long-term goal of translating this knowledge into language supports. My training, practitioner experience, commitment to a research career, and new position as a tenure-track assistant professor at San Diego State University make me make me competitive for federal funding and a strong candidate for the NIH Loan Repayment Program (LRP). LRP will support the continued development of my research career to ultimately improve outcomes for individuals with communication disorders and will be invaluable as I work to establish myself as an independent researcher and competitive applicant for NIH mechanisms to fund my research: R21 NIDCD Early Career Research awards (planned submissions: June '23 and February '24), DP2 (planned submission: August '23), and K23 (planned submission: November '23).

Teresa Girolamo, Ph.D., November 4, 2022
RESEARCH ENVIRONMENT

Scientific Environment. I am transitioning to an Assistant Professor position in the School of Speech, Language, and Hearing Sciences at San Diego State University (SDSU) in January 2023, which is during the LRP award period. The School of Speech, Language, and Hearing Sciences is housed within the SDSU College of Health and Human Services. The College houses nine interdisciplinary research Centers and Institutes which provide vital training and services to the San Diego region and beyond, and a strong research infrastructure. The faculty of the College have a strong record of extramural grant and contract funding, obtaining $65M in extramural funding during the 2021/22 fiscal year, which was approximately 40% of all extramural funding at SDSU.

The School of Speech, Language, and Hearing Sciences at SDSU and the University of California, San Diego have a unique *intercampus* doctoral training program supported by a T32 grant (Neurocognitive Approaches to Communication Disorders), dedicated to research in language and communicative disorders. This program offers collaboration and training opportunities, with regular programing between lab groups facilitating interdisciplinary work among faculty, trainees, and students. I will also build partnerships for recruitment with the SDSU Center for Autism and Developmental Disorders and the SD Regional Center for Developmental Disabilities. I will also have interdisciplinary opportunities for learning and research collaborations with faculty in public health, education, and psychology, and via the SDSU Center for Clinical and Cognitive Neuroscience.

Laboratory/Office. I will have a dedicated laboratory space with 144 square feet and an office with 108 square feet in the School of Speech, Language, and Hearing Sciences. There are many labs and offices of faculty in related fields and students nearby, facilitating collaboration. In addition, the clinic is on the floor beneath the lab. The laboratory space has space for a NIRSport2 16 x 16 array system, a computer and screen for testing, stimulus and assessment material storage, and locked storage space for participant files. I also have access to meeting room and clinic space for lab meetings and data collection through the School of Speech, Language, and Hearing Sciences. My office and lab space will be equipped with PC and Mac computers, phones for research assistants, and the necessary software for data collection, secure storage of digital data, and data analysis. All equipment for the proposed research will be in place by the beginning of the LRP award period.

The Speech-Language-Hearing Clinic is located within the School of Speech, Language, and Hearing Sciences, which has a waiting room, receptionist area, and dedicated parking. The clinic has multiple rooms for testing and services that are each equipped with an observation room and video recording equipment. The Clinic currently provides services to more than 100 clients with communication disorders, delivering intervention services and conducting weekly evaluations face-to-face and via telehealth, with the potential to recruit through the clinic.

Statistical and Computer Support. The College of Health and Human Services, which houses SLHS, has dedicated IT consultants that offer extensive, state-of-the-art services onsite. There are also data servers that allow for server-based applications and centralized services, web-based data collection software (e.g., Zoom, Qualtrics), and statistical software (e.g., SPSS). IT assistance is also available to support data management and security. SDSU also has a Statistical Consulting Group, which provides advice, project management, data management, and statistical analysis support services to faculty.

Institutional Commitment to Investigator. SDSU provides a highly collaborative environment that is well positioned to support my immediate and long-term research aims. I will have a dedicated research mentor who is the Dr. Sadanand Singh Endowed Professor in Speech and Language Sciences, JoAnn Silkes, and a dedicated teaching mentor, Henrike Blumenfield, within SLHS. I will meet with each of these mentors monthly to discuss logistics of establishing a lab and research program, as well as professional development topics, such as balancing research, teaching, and service. In addition, my development as an independent scientist is supported by the College of Health and Human Services. During the LRP award period, I will have a reduced teaching load of one class instead of two classes per semester. I will also apply for internal mechanisms and foundation grants that permit buy-out of teaching. Moreover, I will have significant start-up funding to support my pathway to independence during the NIH LRP award period, as well as opportunities to take on doctoral students via the SLHS T32 training grant and graduate assistantships.