


# Impact of Native Language, English Proficiency, and Language Concordance on Interpersonal Care During Evaluation of Acute Coronary Syndrome



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**BACKGROUND:** High-quality interpersonal interactions between clinicians and patients can improve communication and reduce health disparities among patients with novice English proficiency (NEP). Yet, little is known about the impact of native language, NEP, and native language concordance on patient on perceptions of interpersonal care in the emergency department (ED).

**OBJECTIVE:** To determine the associations of native language, NEP, and native language concordance with patient perceptions of interpersonal care among patients undergoing evaluation for suspected acute coronary syndrome (ACS) in the ED.

**DESIGN, SETTING, AND PARTICIPANTS:** This prospective cohort study included 1000 patients undergoing evaluation for suspected ACS at an urban ED from 2013 to 2016.

**MAIN MEASURES:** English- and Spanish-speaking patients were surveyed to identify native language, English proficiency (classified as advanced, intermediate, or novice), and perceived language of the treating ED clinician. Patient perceptions of interpersonal care were assessed using the Interpersonal Processes of Care (IPC) survey, a validated 18-item tool for assessing social-psychological domains of patient-clinician interactions. IPC scores  $\leq 4$  were categorized as sub-optimal (range, 1–5). The associations between native language, English proficiency, and native language concordance with sub-optimal communication were assessed using hierarchical logistic regression adjusted for all three language variables, sociodemographic characteristics, and depression.

**KEY RESULTS:** Nine hundred thirty-three patients (48.0% native non-English-speaking, 55.7% Hispanic) completed the IPC; 522 (57.4%) perceived native language concordance. In unadjusted analyses, non-English native language (OR 1.38, 95% CI 1.04–1.82) and NEP (OR 1.45, 95% CI 1.06–1.98) were associated with sub-optimal communication, whereas language concordance was protective (OR 0.61, 95% CI 0.46–0.81). In fully adjusted analyses, only language concordance remained significantly associated with sub-optimal communication (AOR 0.62, 95% CI 0.42–0.93).

**CONCLUSIONS:** This study suggests that perceived native language concordance acts as a protective factor for patient-clinician interpersonal care in the acute setting, regardless of native language or English proficiency.

**KEY WORDS:** Communication barriers; Culturally competent care; Healthcare disparities; Language; Social determinants of health.

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## INTRODUCTION

Nearly 66 million residents of the USA speak a language other than English at home.<sup>1</sup> This represents 21.6% of the population over 5 years of age, an increase from 11% in 1980.<sup>1,2</sup> Many of these individuals have limited-English proficiency (LEP) and face challenges communicating in English. Overall, approximately 40% of primary non-English speakers report speaking English less than “very well,” and this percentage is higher for Spanish speakers.<sup>1</sup>

Excellent patient-provider interactions improve rapport, trust, and therapeutic relationships.<sup>3–5</sup> These relational factors in turn can lead to increased uptake of recommended treatments, enhanced social support, and patient empowerment, which improve health outcomes.<sup>3, 4, 6–9</sup> However, communication proves more difficult when the patient and provider do not speak the same language.

Ideal communication with LEP patients occurs in the patients’ preferred language with clinicians who have advanced or “fluent” language skills, or through the use of professional interpreters.<sup>10–16</sup> Even if clinicians are sufficiently skilled in a patient’s preferred language, cultural barriers associated with perceived discordance in native language may impair communication.<sup>17–19</sup> Some studies have demonstrated disparate effects in interpersonal care and health outcomes among LEP patients depending on if they are treated by clinicians who are fluent in their preferred language.<sup>9, 14, 15, 20, 21</sup> Yet, little is known about the impact of perceived native

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language concordance on patient-clinician interactions, particularly in acute care settings such as the ED.

The need to collect an accurate and efficient patient history is critical in the context of an acute illness, and language barriers may represent a particular challenge for patients whose preferred language is not English in a clinical milieu of high acuity and stress.<sup>13, 22</sup> The importance of a detailed history and efficient medical evaluation is particularly salient for common yet potentially life-threatening events such as suspected acute coronary syndrome (ACS). In patients with suspected ACS, non-English language has been associated with longer wait times.<sup>23</sup> By contrast, a retrospective study of patients with chest pain and an ordered troponin test found no difference in clinical outcomes among non-English language speakers when clinicians were fluent in the patients' preferred language.<sup>24</sup> To our knowledge, no studies have quantitatively assessed the impact of patients perceiving that clinicians share the same native language on interpersonal interactions between patients and their treating clinician, which could have different mechanisms for impacting communication, such as through cultural or relational factors.

In this study, we sought to determine the associations of native language, English proficiency, and native language concordance with patient-clinician interpersonal care among patients presenting for evaluation of suspected ACS, using a validated survey for diverse populations. We hypothesized that native non-English language and novice English proficiency would be associated with sub-optimal patient-clinician interactions, whereas native language concordance would be protective against sub-optimal ratings of interpersonal care.

## METHODS

### Study Design, Setting, and Population

This study involved an analysis of data from the Reactions to Acute Care and Hospitalization (REACH) study, an observational cohort study designed to evaluate prevalence, predictors, and prognostic significance of post-traumatic stress disorder in patients evaluated for suspected ACS in the emergency department (ED).<sup>25</sup> The REACH study was conducted at Columbia University Irving Medical Center (CUIMC), an urban academic medical center with cardiac catheterization capabilities. The study site, located in Northern Manhattan, serves a predominantly Hispanic population, mainly from the Dominican Republic and other Latin American countries. This community is 37% LEP and has above-average rates of poverty and unemployment relative to the rest of New York City.<sup>26</sup> The study was approved by the Institutional Review Board at CUIMC.

### Data Collection

The sample included the first 1000 of 1741 patients enrolled in the REACH study, reflecting the phase in which patient-clinician interpersonal interactions were measured. Patients

were eligible for the study if given a provisional diagnosis of "probable ACS" by the treating ED physician. Trained research assistants fluent in English and Spanish screened eligible patients, answered questions, and obtained in-person informed consent for those who chose to participate; they then surveyed patients in-person or over the phone. Exclusion criteria for enrollment included ST-elevations on electrocardiogram, inability to follow study protocol due to cognitive or psychiatric reasons (e.g., dementia or active substance use), need for immediate psychiatric management, and lack of availability for follow-up (e.g., non-cardiac terminal illness). A full description of the study methodology can be found elsewhere.<sup>25</sup>

Patients fluent in English or Spanish were eligible for enrollment. Surveys were conducted in either English or Spanish, according to patient preference. Spanish translations of study materials were performed by a native Spanish speaker with advanced training and certification in language translation. Eligible patients who were interested in the study provided written, informed consent.

### Measurements

Three language variables were used in the analysis. *Preferred language* indicated the language patients' preferred for communicating with the study team, as documented by study coordinators; this language variable was not asked with a standardized question. *Native language* was assessed with the question, "Do you consider English your first language?" (Spanish: "¿Considera usted el inglés su idioma natal?"). Those who answered "No" were classified as native non-English-speaking. Because the wording of "first language" and "idioma natal" do not directly assess a patient's preferred language, we opted to define the language variable as "native language" rather than "preferred language." This operationalization distinguishes the variable in this study from other studies that explicitly categorize language by patient preference.

Native non-English-speaking patients then rated their ability to speak English as "Not at all," "Poorly," "Fairly well," "Well," or "Very well." These 5 categories of patient-reported English fluency differ from the 4 categories used in the US Census assessment (Very well, Well, Not well, Not at all).<sup>2, 27</sup> Specifically, our survey included a minimum skill category, "Poorly," rather than "Not well," and an intermediate "Fairly Well" that is not present in the US Census. In a study by Karliner et al. that used the US Census terminology, patients who responded "Very well" had a high specificity for effective communication in English, while patients who responded "not at all" and "not well" were likely to benefit from language assistance.<sup>27</sup> Since the minimal language category above "Not at all" was likely to benefit from language assistance, we assumed that those who responded to our survey with "Poorly" was a similar proximate to "Not well" and could therefore be grouped together with "Not at all" as those with limited English skills.

Because only English- and Spanish-speaking patients were enrolled, and because the study was conducted in the patient's preferred language, it was assumed that native Spanish-speaking patients who spoke English less than "Very well" were a close proximate for preferred Spanish language. Conversely, we assumed that patients who reported their native language as English, and those who were native non-English but spoke English "Very well," were a close proximate for preferred English Language. Lastly, given these discrepancies and in order to avoid confusion with the official definition of "limited English proficiency" used by the US Census Bureau, we opted to categorize patients into levels of *English proficiency* that used alternative language categories from that used in the US Census.

As such, patients were categorized into levels of *English proficiency* that were "Advanced," "Intermediate," and "Novice." Patients were categorized as "Advanced" if they were native English-speaking or spoke English "Very Well," consistent with measured language ability by US Census research.<sup>28</sup> Patients were categorized as "Novice" if they spoke English "Poorly" or "Not at all," while patients who spoke English "Well" or "Fairly Well" were classified as intermediate. However, the validity of this method has not been formally tested.

Lastly, patients and clinicians were categorized as *language concordant* if patients answered "Yes" to the question, "Was your primary emergency room doctor's first language the same as yours?" A similar assumption was made regarding the wording of the question as described above. The primary ED clinician was not recorded and there was no available hospital data for clinician-reported language ability at the time of the study.

Professional language interpretation services (both in-person and over-the-phone) were available throughout the duration of the study as part of routine care. However, the use of professional, ad hoc, or other interpreters was not collected and therefore not included in the analysis. Clinician language ability was not collected nor tested.

Patient demographic characteristics used for descriptive and multivariable analyses were obtained by patient interview, and included age, gender, ethnicity, education, and health insurance status, defined in this study as whether the patient experienced any lapse of health insurance in the preceding 2 years. Demographic characteristics were included in adjusted models due to associations with perceptions of patient-clinician communication and interpersonal care in prior studies.<sup>29-31</sup> Race was not used as a covariate due to large numbers of non-response, common among Hispanics of Dominican descent.<sup>32</sup> Whether the patient reported being alone in the ED was included given the potential for companions to act as interpreters or otherwise influence interactions with clinicians. Depression, defined as an eight-item Patient Health Questionnaire depression scale (PHQ-8) score  $\geq 10$ , was included given known associations between depression and patient perceptions of interpersonal care.<sup>33, 34</sup>

## Outcomes

Patient perceptions of interpersonal care were assessed using the 18-item Interpersonal Processes of Care (IPC) survey. The survey assesses the social-psychological aspects of patient-clinician interactions, especially among culturally, linguistically, and socioeconomically diverse populations, and is validated in both English and Spanish.<sup>29, 35, 36</sup> No modifications were made to the validated survey tool. Questions were coded from 1 to 5 such that higher values on each item represent better patient-reported interactions.

Survey questions are grouped into three domains of patient-clinician interactions: communication (eliciting concerns, explanations), decision-making (shared-decision-making), and interpersonal style (compassion, respectfulness). Sample questions included, "How often did the doctor: speak too fast? Take your health concerns seriously? Treat you as an equal?" For this study, the internal consistency of the IPC was excellent (Cronbach's  $\alpha = 0.85$ ).

## Data Analysis

For patients with missing data on individual IPC items, missing data were imputed using maximal likelihood estimates to produce a single IPC summary score. IPC summary scores were positively skewed (Kolmogorov-Smirnov  $< 0.01$ ); therefore, consistent with prior studies using the IPC, scores were dichotomized as "optimal" or "sub-optimal," with "sub-optimal" defined as mean item value  $\leq 4$ .<sup>17, 33, 37</sup>

The chi-square and *t*-tests were used to compare characteristics among patients who were and were not native English language speakers. Hierarchical logistic regression was used first to determine the unadjusted associations between the language variables (native language, English proficiency, and language concordance) and sub-optimal IPC scores; then, to determine the associations between the individual language variables and sub-optimal IPC, adjusting for covariates selected a priori; and finally, with adjustment for all language variables and covariates concurrently.

All primary analyses were conducted at an a priori significance level of 0.05. All analyses were conducted using SAS software, University Edition, Version 9.4 of the SAS System.

## RESULTS

A consecutive sample of patients presenting to the ED with suspected ACS were enrolled from November 2013 to December 2016; 61% of those eligible consented to participate. Of the 1000 patients in the cohort, 933 completed the IPC survey and were included in these analyses. The mean age of the sample was 60.7 (SD 13.1) years, 46.2% were female, and 55.7% were Hispanic (Table 1). Native non-English-speaking patients accounted for 48.0% of the study population. Compared to native English-speaking patients, native non-English-speaking patients were more likely to be Hispanic, older, less

Table 1 Patient Characteristics by Native Language

Characteristic	n	Overall	Native language		P-value
		n (%) or mean (SD)	English	Non-English	
Native language	933	—	485 (52.0)	448 (48.0)	—
Age in years	933	60.7 (13.1)	58.7 (12.9)	62.8 (13.0)	< 0.001
Female	933	431 (46.2)	211 (43.5)	220 (49.1)	0.09
Hispanic	910	507 (55.7)	95 (20.4)	412 (92.8)	< 0.001
Health insurance	931	824 (99.5)	437 (90.5)	387 (86.4)	0.05
Education	932	—	—	—	< 0.001
Completed high school	—	195 (20.9)	107 (22.1)	88 (19.6)	
Some college or vocational	—	163 (17.5)	102 (21.1)	61 (13.6)	
College graduate or more	—	254 (27.3)	197 (40.7)	57 (12.7)	
Alone in emergency department	929	397 (42.7)	223 (46.1)	174 (39.1)	0.32
Depression (PHQ-8 ≥ 10)	932	250 (26.8)	125 (25.8)	125 (27.9)	0.47
English proficiency	930	—	—	—	N/A
Fluent	—	550 (59.1)	485 (88.2)	65 (11.8)	
Intermediate	—	105 (11.3)	0 (0)	105 (100)	
Limited	—	275 (29.6)	0 (0)	275 (100)	
Language concordance	909	522 (57.4)	417 (89.1)	105 (23.8)	< 0.001

educated, and more likely to be accompanied in the ED. Of all patients, 29.6% had novice English proficiency (NEP). Language concordance was reported among 57.4% of the patients and was lower among native non-English-speaking patients than native English-speaking patients.

Sub-optimal patient perceptions of interpersonal care (average IPC item ≤ 4) were found in 30.0% of patients (Table 2). A greater proportion of native non-English speakers, compared to native English speakers, reported sub-optimal interpersonal care (33.5% vs. 26.8%,  $p = 0.03$ ; Figure 1) as did NEP patients compared to advanced English patients (35.6% vs. 27.6%,  $p = 0.05$ ) and patients reporting native language discordance compared to those with native language concordance (36.2% vs. 25.7%,  $p < 0.001$ ). In unadjusted analyses, native non-English speakers had greater odds of sub-optimal interpersonal care (OR 1.38, 95% CI 1.04–1.82; Table 3), as did NEP patients relative to patients who had advanced English proficiency (OR 1.45, 95% CI 1.06–1.98). In contrast, those patients with versus without native language concordance had lower odds of sub-optimal interpersonal care (OR 0.61, 95% CI 0.46–0.81). In the model adjusting for covariates only, the association for language concordance remained significant (AOR

0.65, 95% CI 0.46–0.92), while the associations for native non-English language and NEP did not (AOR 1.10, 95% CI 0.72–1.73 and AOR 1.05, 95% CI 0.67–1.66, respectively). In the fully adjusted model accounting for all language variables and covariates, the findings were similar (language concordance AOR 0.62, 95% CI 0.42–0.93).

Consistent with the prior study of the first 500 patients in this cohort, patients with depression (PHQ-8 scores ≥ 10) had greater odds of sub-optimal interpersonal care (OR 2.11, 95% CI 1.54–2.89; Table 3) than patients with PHQ-8 scores < 10, controlling for covariates.<sup>33</sup> No other covariate was significantly associated with sub-optimal communication in the multivariable models.

## DISCUSSION

Our analyses assessed the association between language and patient perceptions of interpersonal care among patients with suspected ACS who presented to an urban hospital with a large Spanish-speaking population. We found that patients who perceived native language concordance with their treating

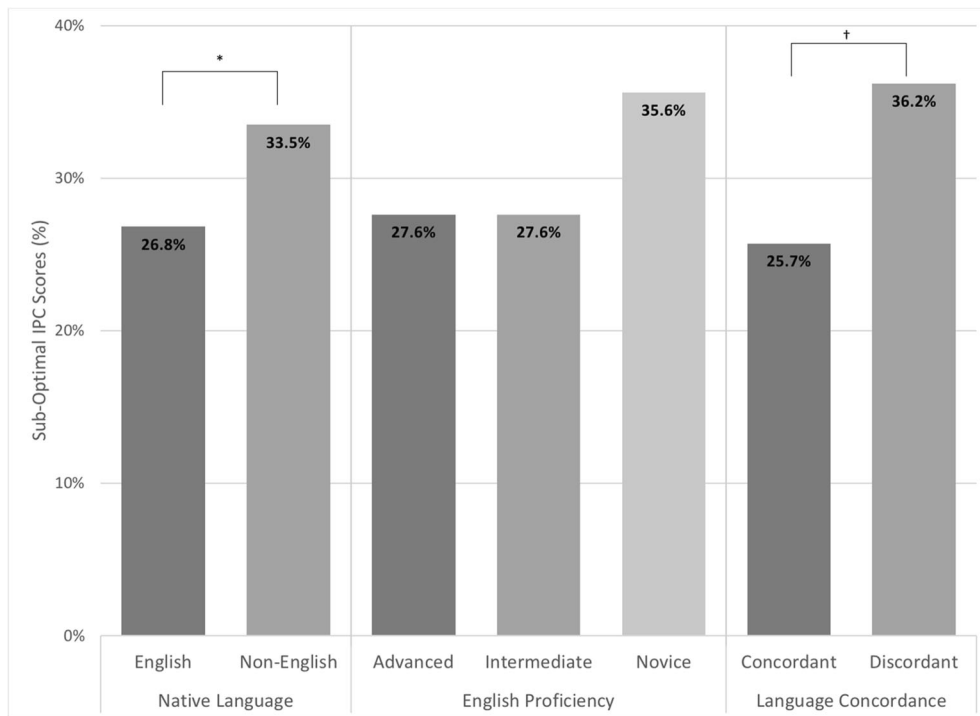
Table 2 Association of Language with Patient-Clinician Interpersonal Care

Variable	IPC summary score			Chi-square
	Total	Optimal	Sub-optimal	
Native language	933 (100)	653 (70.0)	280 (30.0)	0.03*
English	485 (52.0)	355 (73.2)	130 (26.8)	
Non-English	448 (48.0)	298 (66.5)	150 (33.5)	
English proficiency	930 (100)	651 (70.0)	279 (30.0)	0.05
Advanced	550 (59.1)	398 (72.4)	152 (27.6)	
Intermediate	105 (11.3)	76 (72.4)	29 (27.6)	
Novice	275 (29.6)	177 (64.4)	98 (35.6)	
Language concordance	909 (100)	635 (69.9)	274 (30.1)	< 0.001†
Concordant	522 (57.4)	388 (74.3)	134 (25.7)	
Discordant	387 (42.6)	247 (63.8)	140 (36.2)	

\*Significant at  $p < 0.05$

†Significant at  $p < 0.001$





**Fig. 1. Proportion of patients reporting of sub-optimal interpersonal care. IPC, Interpersonal Processes of Care survey score, where average item score  $\leq 4$  is considered sub-optimal. \* $p < 0.05$ . † $p < 0.001$**

ED clinician had lower odds of sub-optimal interpersonal care, controlling for covariates, native language, and English proficiency. Unadjusted associations were also seen with native non-English language and NEP but were lost in the adjusted analysis before the addition of language concordance,

suggesting that native language and English proficiency were not independently associated with sub-optimal interpersonal care when treated by the clinicians in our ED. Given that perceived native language concordance was protective regardless of native language or English proficiency, it is plausible

**Table 3 Multivariable Hierarchical Regression Model of Language and Interpersonal Processes of Care**

Variable	N	Unadjusted			N	Model 1*			Model 2† (n = 900)		
		OR	95% CI	P-value		OR	95% CI	P-value	OR	95% CI	P-value
Non-English native language (ref: English)	933	1.38	1.04, 1.82	0.03‡	926	1.11	0.72, 1.70	0.64	1.03	0.54, 1.98	0.94
Intermediate English proficiency (ref: advanced)	930	1.00	0.63, 1.59	0.42	923	0.84	0.49, 1.43	0.40	0.75	0.37, 1.50	0.35
Novice English proficiency (ref: advanced)	930	1.45	1.06, 1.98	0.03‡	923	1.05	0.67, 1.66	0.49	0.93	0.50, 1.74	0.75
Language concordance (ref: discordance)	909	0.61	0.46, 0.81	< 0.001§	903	0.65	0.46, 0.92	0.02‡	0.62	0.42, 0.93	0.02‡
Age	—	—	—	—	—	N/A	N/A	N/A	1.00	0.99, 1.01	0.97
Hispanic ethnicity	—	—	—	—	—	N/A	N/A	N/A	1.13	0.72, 1.77	0.60
Female gender	—	—	—	—	—	N/A	N/A	N/A	0.98	0.73, 1.32	0.88
Health insurance	—	—	—	—	—	N/A	N/A	N/A	0.91	0.57, 1.46	0.70
Completed high school	—	—	—	—	—	N/A	N/A	N/A	0.86	0.56, 1.33	0.70
Some college or vocational	—	—	—	—	—	N/A	N/A	N/A	0.81	0.51, 1.29	0.44
College graduate or ,ore	—	—	—	—	—	N/A	N/A	N/A	0.99	0.64, 1.51	0.56
Alone in ED	—	—	—	—	—	N/A	N/A	N/A	1.19	0.88, 1.60	0.26
Depression (PHQ-8 $\geq 10$ )	—	—	—	—	—	N/A	N/A	N/A	2.11	1.54, 2.89	< 0.001§

Note: variable N due to missingness

\*Model 1: three separate logistic regression models for each language variable with covariates (age, ethnicity, gender, health insurance, education, alone in ED, and depression)

†Model 2: full logistic regression of all language variables (native language, English proficiency, language concordance) and covariates (age, ethnicity, gender, health insurance, education, alone in ED, and depression)

N/A: covariate associations for the three separate logistic regression models in model 1 are not shown

‡Significant at  $p < 0.05$

§Significant at  $p < 0.001$

that other components related to native language concordance — such as concordant cultural or relational factors — operate to improve interpersonal care in diverse populations.

This study adds to the growing body of evidence that language concordance protects against perceptions of low-quality interpersonal care. It is known that language barriers can influence health communication and health outcomes, and have been shown to contribute to health disparities.<sup>19, 20, 38–40</sup> Patient satisfaction and ratings of interpersonal care have been found to be higher among non-English speakers when patients interact with clinicians fluent in their native language.<sup>9, 15, 41</sup> For example, in one study of Chinese and Vietnamese LEP patients, patients who saw clinicians fluent in their native language reported greater health education scores and higher ratings of clinicians' interpersonal care; importantly, for those whose clinicians were not fluent in their native language, the disparate effects on interpersonal care remained even when an interpreter was used.<sup>14</sup>

Our study was novel in that language concordance was defined by patient perceptions of the clinician's native language, rather than clinician-reported fluency or interpreter use. Interpreter use can be an important effect modifier of language discordance and has been associated with reducing disparate patient outcomes among limited English proficiency patients.<sup>10, 11, 13–16, 42–45</sup> However, in our population, novice English proficiency was not associated with poor interpersonal care, potentially due to the high prevalence of Spanish-speaking patients and subsequent adaptations of the local ED to meet the needs of the community. Additionally, treating clinicians with advanced language skills in the patient's native language, or clinicians who used an interpreter, could still be perceived as having native language discordance by the patient (for example, due to an accent, dialect, or inconsequential paraphrastic errors). In this scenario, despite appropriate language communication, the patient would still report language discordance. This differential misclassification would be hypothesized to bias the result towards the null, since misclassifying true language concordant pairs into the language discordance group would be expected to make the groups more similar. The fact that perceived native language concordance remains protective against poor interpersonal care suggests that other mechanisms, such as cultural or relational factors associated with native language concordance, may be affecting interpersonal care. This conclusion is supported by prior literature on patient-clinician communication and therapeutic alliance, which can be affected by communication skills, racial and ethnic concordance with clinicians, and native language.<sup>4, 5, 46, 47</sup> Racial and ethnic concordance may also contribute to differential health outcomes.<sup>48</sup>

There were several limitations to our study. First, enrollment was limited to patients fluent in English or Spanish, meaning that non-English non-Spanish patients were excluded. Patients with a native language other than English or

Spanish could be enrolled but had to have been fluent in one of the two languages; whether language concordance impacts interpersonal care in patients who speak other languages cannot be concluded from this study. Second, language concordance was based on patient perceptions. Patient perceptions of clinician language ability are not a validated means of determining language concordance. As a result, it was not clear whether having native language ED clinicians was necessary to obtain this benefit to interpersonal care or whether advanced language abilities would be sufficient, or if the question was measuring a different dimension of the patient-clinician relationship, such as perceived bias. More objective measures of physician non-English language ability, such as tested language ability, may be more accurate in determining whether language concordance was present.<sup>42, 43</sup> Third, self-reported English ability was determined by patient report, and patient report of general language skills may not accurately capture one's ability to communicate in a healthcare setting.<sup>49</sup> Future studies may benefit from objective assessments of language abilities in a healthcare context for both patients and clinicians. Lastly, patient-reported English fluency differs from the US Census assessment as described in "METHODS".<sup>27</sup> Though an adapted version of English ability was used to address this discrepancy, the validity of this method has not been formally tested.

In summary, our study found that patients with suspected ACS who perceived native language concordance with their clinician had lower odds of reporting poor interpersonal care, while native language and English proficiency were not associated. Cultural and relational factors related to native language concordance may impact perceptions of interpersonal care in the acute setting. Our study is strengthened by the substantial sample size and the use of a quantitative, validated tool for evaluating interpersonal care among diverse patient populations. Future studies should evaluate the impact of perceived native language concordance on health outcomes and ways to overcome barriers to interpersonal care when native language concordance cannot be achieved.

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**Author Contribution** D.S.E., D.M.P., and I.M.K. were involved in the conception and design of the specific work; E.K.R., B.P.C., and I.M.K. were involved in the design and data acquisition of the initial study. D.S.E. conducted the statistical analysis, with assistance from D.M.P. and I.M.K., and wrote the manuscript. All authors contributed to the review, critical revision, and final approval of the manuscript.

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**Declarations:**

**Conflict of interest:** D.S.E., D.M.P., E.K.R., B.P.C., and I.M.K report no conflict of interest.

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