ИЗДАТЕЛЬСТВО ГРАМОТА

Филологические науки. Вопросы теории и практики
Philology. Theory & Practice

ISSN 2782-4543 (online)
ISSN 1997-2911 (print)

2026. Том 19. Выпуск 6 | 2026. Volume 19. Issue 6
Материалы журнала доступны на сайте (articles and issues available at): philology-journal.ru

RU

Методологические подходы к изучению иноязычного акцента как социального сигнала

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Аннотация. Цель исследования заключается в разработке интегративной многоуровневой модели иноязычного акцента как социально функционирующего сигнала. В статье проводится теоретико-методологический анализ современных подходов к изучению акцента на материале германских языков (прежде всего английского и немецкого) и предлагается структурная модель его функционирования на уровнях речепродукции, восприятия, когнитивной интерпретации и социальной оценки. Научная новизна работы состоит в разработке авторской четырехкомпонентной модели (фонетическая реализация – перцептивная салиентность – когнитивная интерпретация – социальная атрибуция), описывающей механизм перехода от фонологического трансфера из L1 в L2 у говорящего к социально значимой интерпретации с позиции слушающего. Предлагаемая модель обеспечивает целостное представление о взаимосвязи процессов речепроизводства, его восприятия и оценки говорящего, рассматривая акцент как результат последовательной многоуровневой обработки, а не как прямое следствие интерференции. Несмотря на значительный объем эмпирических исследований, изучение иноязычного акцента остается методологически фрагментированным: различные подходы сосредоточены на отдельных аспектах анализа и не предлагают их явного взаимодействия, вследствие чего до настоящего времени отсутствует целостная модель, объясняющая, каким образом акустическая вариативность приводит к социальной категоризации говорящего. Полученные результаты заключаются в систематизации и интеграции ключевых методологических подходов к исследованию акцента – фонетического, перцептивного, когнитивного и социально-оценочного – как соответствующих различным, но взаимосвязанным уровням его функционирования. Показано, что их изолированное применение не обеспечивает целостного объяснения, тогда как выявленная методологическая фрагментарность преодолевается в рамках предложенной интегративной модели, связывающей акустическую вариативность с перцептивной салиентностью, когнитивной обработкой и социальной атрибуцией. Тем самым акцент концептуализируется как социально функционирующий сигнал, а предложенная модель обеспечивает единую аналитическую основу для объединения экспериментальной фонетики, социо- и психолингвистики.

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Methodological approaches to studying foreign accent as social signal

M. V. Popova

Abstract. The aim of the study is to develop an integrative multi-level model of foreign accent as a socially functioning signal. The paper provides a theoretical and methodological analysis of contemporary approaches to accent research based on Germanic languages (primarily English and German) and proposes a structural model of its functioning across the levels of speech production, perception, interpretation, and social evaluation. The scientific novelty of the study lies in the development of an original four-component model (phonetic realization – perceptual salience – cognitive interpretation – social attribution) that accounts for the transformation of phonological transfer from L1 to L2 into socially meaningful outcomes. The model provides a unified account of how speech production, perception, and evaluation are interconnected, conceptualizing accent as the result of sequential multi-level processing rather than as a direct consequence of interference. Despite a substantial body of empirical research, foreign accent studies remain methodologically fragmented, with different approaches focusing on isolated fields of analysis and lacking an explicit account of their interaction. Consequently, there is no integrative framework so far that explains how acoustic variation gives rise to higher-level interpretation and social evaluation. The results consist in the systematization and integration of the key methodological approaches to accent research – phonetic, perceptual, cognitive, and socio-evaluative – as corresponding to distinct yet interrelated levels

Научная статья (original research article) | https://doi.org/10.30853/phil20260277

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of its functioning. It is demonstrated that their isolated application does not provide a comprehensive account, whereas the identified methodological fragmentation is overcome within the proposed integrative model linking acoustic variation to perceptual salience, cognitive processing, and social attribution. Within this framework, foreign accent is conceptualized as a socially operative signal, and the proposed model establishes a unified analytical basis for integrating experimental phonetics with socio- and psycholinguistic approaches.

Introduction

The relevance of the present study stems from the increasing role of foreign accent as a socially significant phenomenon in multilingual societies. Intensified migration, global mobility, and the expansion of intercultural communication have substantially increased the frequency of interactions involving non-native speech. Under these conditions, foreign accent functions not merely as a phonetic feature but as an indexical cue influencing interpersonal perception, institutional evaluation, and processes of social categorization. Empirical research increasingly demonstrates that accent affects judgments of competence, credibility, employability, and legitimacy across educational and professional settings. These developments create a pressing need for analytical models capable of explaining how phonetic variation becomes socially meaningful. However, existing research traditions remain methodologically fragmented and typically focus on isolated levels of analysis. This makes it necessary to develop an integrative framework linking speech production, perceptual salience, cognitive mediation, and social attribution within a coherent explanatory model.

Within this context, foreign accent should be approached not as an isolated phonetic deviation but as a multidimensional communicative phenomenon emerging through the interaction of phonetic realization, listener perception, cognitive processing, and evaluative interpretation. Such a perspective makes it possible to explain how micro-level perceptual processes may contribute to broader patterns of social inequality and stratification.

Traditionally, foreign accent has been examined within phonetics, second language acquisition (SLA), and sociolinguistics (in particular, sociophonetics), primarily in relation to cross-linguistic transfer and phonetic category restructuring in bilingual speakers. Contemporary models of L2 speech learning, including the Revised Speech Learning Model (SLM-r), conceptualize accent strength as the outcome of dynamic interaction between phonological systems across the lifespan (Flege, Bohn, 2021). However, under contemporary conditions of intensified migration, mobility, and intercultural contact, foreign accent has become increasingly consequential in institutional and interpersonal interaction. Accent thus extends beyond speech production and becomes involved in mechanisms of perception, evaluation, and decision-making. A substantial body of research demonstrates that foreign-accented speech shapes assessments of trustworthiness, competence, employability, and social belonging (Lev-Ari, Keysar, 2010; Schmaus, Kristen, 2022; Lorenz, Kogan, Gentrup et al., 2024), and may contribute to cumulative forms of institutional differentiation (Hideg, Shen, Koval, 2024; Maindidze, Randall, Martin-Raugh et al., 2025).

A central issue underlying this reconceptualization concerns the relationship between interference and accent. Interference refers to cross-linguistic transfer within the speaker's phonological system, whereas accent emerges only when such transfer becomes perceptually salient and socially interpreted. Accent therefore cannot be reduced to acoustic deviation alone; it exists at the intersection of production and perception and acquires broader evaluative significance only through interpretive processing. Sociolinguistic theories of indexicality (Labov, 1972; Silverstein, 2003) and social-psychological models of processing fluency and stereotype activation (Lev-Ari, Keysar, 2010; Dragojevic, Dayton, 2025) provide complementary insights into how phonetic variation becomes embedded in systems of social categorization.

Against this background, the present paper proposes an integrative methodological framework for investigating foreign accent as a multilevel social signal. Rather than reducing accent to deviation from a phonetic norm, the study conceptualizes it as a stratified phenomenon spanning acoustic production, perceptual recognition, cognitive mediation, and social attribution.

The achievement of the stated aim requires solving the following research tasks:

1) to clarify the conceptual distinction between interference and accent within the framework of speech science and sociophonetics;
2) to systematize the dominant methodological paradigms in accent research and determine their analytical scope;
3) to identify mediation mechanisms linking perceptual salience to social evaluation;
4) to integrate the identified theoretical and empirical findings into a coherent multilevel analytical framework.

The research materials include a structured empirical corpus comprising experimental and observational studies on foreign-accented speech, focusing primarily on English and German. The corpus was constructed through targeted selection of studies representing key methodological traditions in accent research. Inclusion criteria required that each study provide empirically grounded data on at least one level of accent functioning and report measurable outcomes (e.g., acoustic parameters, perceptual ratings, processing measures, or social evaluations). To ensure analytical consistency, the corpus integrates studies employing comparable experimental paradigms, including controlled phonetic production experiments, perception tasks (e.g., accentedness, intelligibility, comprehensibility ratings), processing-based designs (e.g., fluency judgments and expectation manipulation), and socio-evaluative experiments (e.g., matched-guise and quasi-experimental designs in institutional contexts). In total, the corpus comprises more than 30 studies, with each level of analysis represented by a comparable subset of empirical findings (roughly comparable subsets across levels), allowing for systematic cross-level comparison.

At the level of speech production, the corpus incorporates data from experimental phonetic studies examining phonological transfer and L2 speech realization, including acoustic and articulatory analyses (Flege, Bohn, 2021; Kartushina, Hervais-Adelman, Frauenfelder et al., 2016; Maastricht, Krahmer, Swerts, 2021; Popova, 2021).

At the perceptual level, the corpus includes studies addressing accentedness, intelligibility, and comprehensibility, based on listener judgment tasks and controlled perception experiments (Derwing, Munro, 2015; Nejjari, McQueen, Weber, 2020; Foucart, Costa, Moris-Fernández et al., 2020). These studies provide quantitative measures of how phonetic variation is detected and processed by listeners.

At the cognitive interpretation level, the selected studies focus on mechanisms of processing fluency, expectation-driven perception, and categorization of accented speech, typically operationalized through response-time measures, evaluation tasks, and experimental manipulation of listener expectations (Lev-Ari, Keysar, 2010; Kahneman, 2011; Kang, Rubin, 2012).

At the level of social evaluation, the corpus comprises experimental and quasi-experimental studies investigating the impact of accent on judgments of credibility, competence, employability, and decision-making. These include matched-guise experiments, hiring simulations, and educational evaluation contexts (Gluszek, Dovidio, 2010; Roessel, Schoel, Stahlberg, 2018; Schmaus, Kristen, 2022; Levon, Sharma, Watt et al., 2021; Lorenz, Kogan, Gentrup et al., 2024; Spence, Hornsey, Stephenson et al., 2024; Maindidze, Randall, Martin-Raugh et al., 2025; Hideg, Shen, Koval, 2024).

In addition, the corpus incorporates sociolinguistic and theoretical approaches to speech variation and indexicality (Labov, 1972; Lippi-Green, 1997; Silverstein, 2003), as well as research on multimodal perception and speech behavior (Потапова, Потапов, Комалова, 2020; Potapova, Potapov, Komalova, 2021), which provide a broader interpretive framework for integrating findings across levels and conceptualizing accent as a socially meaningful signal.

The choice of research methods is determined by the aim of the study. The analysis combines a theoretical-analytical approach with comparative conceptual analysis to differentiate key constructs across research traditions, in particular phonological transfer (interference) and accent as a perceptually and socially interpreted phenomenon. The systematization of methodological paradigms is based on descriptive-analytical and classification procedures applied to a structured corpus of empirical studies. The data are organized according to four levels of accent functioning identified in the corpus. At each level, the analysis relies on comparable types of empirical evidence, including acoustic parameters (e.g., segmental and prosodic variation), perceptual ratings (e.g., accentedness, intelligibility), processing-based measures (fluency and expectation-driven judgments), and socio-evaluative outcomes (e.g., competence, credibility assessments). To identify cross-level relationships, the study employs a synthesis of experimental findings drawn from production, perception, and evaluation paradigms. The central methodological principle is modeling: empirical results are systematically aligned across levels to reconstruct the transition from phonetic variation to perceptual salience, cognitive processing, and social attribution. This integration is achieved through comparative modeling and structural synthesis, enabling the construction of a coherent multilevel analytical framework.

The theoretical basis of the study is grounded in several complementary research traditions. It draws on classical works in contact linguistics and interference theory (Вайнрайх, 1979), which conceptualize cross-linguistic transfer as a structural mechanism of phonological interaction. It further incorporates sociolinguistic and indexical approaches (Labov, 1972; Silverstein, 2003; Lippi-Green, 1997), which interpret linguistic variation as a carrier of socially structured meaning. The analysis is also informed by social-psychological research on accent evaluation (Lev-Ari, Keysar, 2010; Gluszek, Dovidio, 2010; Dragojevic, Dayton, 2025), as well as by studies addressing institutional discrimination and accent-based differentiation in professional and educational contexts (Schmaus, Kristen, 2022; Hideg, Shen, Koval, 2024; Maindidze, Randall, Martin-Raugh et al., 2025). A central theoretical foundation is provided by the Russian speech science tradition (Потапова, 1986; Потапова, Потапов, 2006; 2012; Потапова, Потапов, Комалова, 2020; Potapova, Potapov, Komalova, 2021), which conceptualizes speech as a complex system of socially diagnostic features and offers a framework for interpreting accent as an element of the speaker's speech portrait.

The practical significance of the study consists in the possibility of applying its theoretical and methodological results within university-level philological education and research. The proposed framework may be incorporated into courses in sociolinguistics, speech communication, theoretical and practical phonetics, as well as into specialized modules devoted to language contact, migration linguistics, and linguistic ideology. The conceptualization of foreign accent as a socially mediated speech phenomenon also provides a foundation for interdisciplinary teaching on language and social stratification, contributing to the development of critical approaches to linguistic normativity and legitimacy. In addition, the findings may inform the preparation of teaching materials and methodological guidelines aimed at fostering a reflexive understanding of accent perception and the socio-cultural dimensions of speech variation.

Discussion and results

The following section presents the analytical results of the theoretical and methodological investigation.

1. Conceptual Foundations: From Interference to Social Signal

The results of the conceptual and comparative analysis demonstrate that the relationship between interference and accent has been conceptualized differently across research traditions, contributing to terminological and analytical ambiguity in accent research.

The study of foreign accent developed within the broader framework of language contact and bilingualism. Classical contact linguistics conceptualizes interference as cross-linguistic transfer operating within the speaker's phonological

system (Вайнрайх, 1979). Interference manifests itself in systematic deviations from target-language norms and represents a structural interaction between phonological systems.

Within the Russian phonetic tradition, interference is likewise treated as a production-based phenomenon localized in the speaker's linguistic system, whereas accent is understood as the perceptually and socially actualized manifestation of such transfer (Виноградов, 1976; Лебедева, 1981; Вишневская, 1993). The decisive distinction, therefore, lies not in the presence of phonetic deviation as such, but in its perceptual recognition and social interpretation. This analytical differentiation clarifies that accent emerges only at the interface between production and perception.

The theory of fundamental and applied speech science developed by Potapova (Потапова, 1986) provides a conceptual bridge between phonetic structure and social meaning. Within this framework, speech is regarded as a complex unity of verbal and paraverbal correlates of socially conditioned behavior. Voice and prosodic characteristics convey information about territorial affiliation, social positioning, emotional stance, and individual identity (Потапова, Потапов, 2006). From this perspective, phonetic variation functions as part of a broader communicative system through which socially diagnostic information is transmitted.

Contemporary L2 speech models, including the SLM-r, similarly emphasize the dynamic interaction of phonetic categories across the lifespan (Flege, Bohn, 2021). Yet even measurable transfer acquires social relevance only when it becomes perceptually salient and embedded in interpretive processes. This leads to the central conceptual proposition of the present study: accent is not identical to acoustic deviation; it is the socially mediated realization of phonological transfer within communicative interaction.

This formulation allows interference and accent to be analytically distinguished without reducing accent to error or deviation. Interference constitutes the structural substrate; accent emerges as its socially meaningful articulation.

2. Accent as Indexical Meaning

The relationship between speech style and social evaluation has long been established in sociolinguistic research (Giles, Powesland, 1975), demonstrating that phonetic variation systematically shapes impressions of status, competence, and group affiliation. Once perceptually recognized, accent enters the domain of indexical interpretation. Sociolinguistic theory has demonstrated that linguistic variation functions as an index of social meaning (Labov, 1972; Silverstein, 2003). Phonetic features may signal regional origin, educational background, social positioning, and group affiliation.

Within the framework of speech science, accent can be viewed as one of the salient components of the speaker's "speech portrait" (Потапова, 2000; Потапова, Потапов, 2006; Popova, 2021). Phonetic and prosodic characteristics do not function as isolated acoustic markers; they contribute to a holistic semiotic configuration through which speakers are socially positioned and categorized. Foreign accent thus operates as an indexical cue activating interpretive schemas associated with foreignness, migration background, or perceived belonging. Standard language ideology embeds accent within systems of normativity and hierarchy (Lippi-Green, 1997), transforming phonetic variation into a socially evaluable feature.

Empirical research confirms that accent influences credibility, trust, competence attribution, and professional evaluation (Lev-Ari, Keysar, 2010; Schmaus, Kristen, 2022; Spence, Hornsey, Stephenson et al., 2024; Dragojevic, Dayton, 2025). Accent has been shown to shape trait attributions across institutional contexts and language communities (Foucart, Costa, Moris-Fernández et al., 2020; Levon, Sharma, Watt et al., 2021; Ng, Cheng, 2024; Roth, 2025). Implicit bias studies further demonstrate spontaneous negative associations toward nonnative accents (Roessel, Schoel, Stahlberg, 2018). These findings indicate that accent activates socio-cognitive categorization mechanisms that exceed purely linguistic processing.

The conceptual shift at this stage lies in recognizing that accent functions not merely as phonetic variation, but as socially interpretable meaning embedded in ideological structures.

3. Accent as Social Signal

Integrating phonetic, perceptual, and indexical perspectives allows foreign accent to be conceptualized as social signal. In this view, accent operates as a communicatively salient cue whose effects unfold across interacting levels of production, perception, cognition, and institutional evaluation.

Recent research across applied domains underscores this functional dimension. Accent has been shown to influence hiring decisions (Schmaus, Kristen, 2022), workplace evaluation (Hideg, Shen, Koval, 2024), interview outcomes (Maindidze, Randall, Martin-Raugh et al., 2025), and teacher expectations in educational settings (Lorenz, Kogan, Gentrup et al., 2024). Psycholinguistic evidence further demonstrates that accent effects are mediated by processing fluency and stereotype activation (Lev-Ari, Keysar, 2010; Dragojevic, Dayton, 2025). Even when intelligibility remains high, accent may shape judgments of credibility and competence, indicating that evaluation is not reducible to communicative clarity.

However, not all empirical evidence supports a uniformly negative effect of L2-accented speech. Experimental work in Lingua Franca English contexts has demonstrated that Dutch-accented English was understood as well as standard British and American accents and did not consistently trigger lower status evaluations across listener groups (Nejjari, McQueen, Weber, 2020). These findings underscore the context-sensitive and community-embedded nature of accent evaluation.

These insights support a multilevel trajectory:

1. Phonological transfer.
2. Acoustic realization.

3. Perceptual salience.
4. Indexical interpretation.
5. Social evaluation and institutional consequence.

Within this architecture, accent cannot be reduced either to a purely linguistic or to a purely social phenomenon. Rather, it emerges through a series of perceptual and interpretive steps that connect phonetic variation with socially meaningful evaluation.

4. The Methodological Gap

Despite extensive empirical research on accent perception and bias (Hideg, Shen, Koval, 2024; Maindidze, Randall, Martin-Raugh et al., 2025), methodological traditions remain insufficiently integrated. Production-based studies quantify acoustic deviation without modeling interpretive mediation. Perceptual research measures accentedness without consistently distinguishing detection from evaluation. Social-psychological approaches document evaluative outcomes without systematically linking them to specific phonetic parameters.

Although speech science conceptualizes socially relevant speech characteristics as integrated systems (Потапова, Потапов, 2006), this integrative logic remains underdeveloped in contemporary accent research. It remains unclear:

- which phonetic parameters become socially salient;
- how perceptual recognition translates into stereotype activation;
- under which contextual conditions accent produces institutional disadvantage;
- and how listener variables moderate these processes.

Addressing this fragmentation requires a methodological framework that can trace how phonological transfer develops into socially consequential accent perception. The present study responds to this need by proposing an integrative multilevel architecture that connects acoustic parameters, perceptual recognition, cognitive mediation, and institutional evaluation within a single analytical perspective. The following section therefore reviews the dominant methodological paradigms in accent research and considers how they can be situated within this multilevel approach to foreign accent as social signal.

5. Methodological Paradigms in Accent Research

If foreign accent is viewed as a multilevel process linking phonological transfer to socially consequential evaluation, methodological approaches should ideally capture each stage of this trajectory. In practice, however, research traditions have often focused on separate fragments of this chain. Phonetic studies primarily investigate acoustic deviation in speech production, perceptual research concentrates on listener judgments, social-psychological work examines evaluation outcomes, and applied studies address institutional consequences. Each of these traditions has produced valuable insights. Yet because they have largely developed in parallel, their findings are not always integrated into a common explanatory framework.

For the purposes of the present study, it is therefore useful to consider these approaches not as competing paradigms but as analytically complementary perspectives. Each of them highlights a different phase in the transformation of phonological transfer into socially meaningful accent perception. Taken together, they allow us to reconstruct the full trajectory from speech production to social evaluation.

The following subsections outline four methodological approaches that have become particularly influential in contemporary accent research: production-based phonetic analysis, perceptual-experimental paradigms, social-evaluative designs, and cognitive-processing approaches. Each of these paradigms corresponds to a specific stage in the interference – accent – social signal trajectory and contributes a distinct set of research tools.

At the same time, it should be noted that these paradigms do not always align neatly in empirical practice. Many studies combine elements from several traditions without explicitly articulating the underlying methodological logic. As a result, the relationship between phonetic variation, perceptual recognition, and social evaluation often remains only partially specified. One of the aims of the present framework is therefore to clarify how these approaches can be positioned within a single multilevel analytical architecture.

5.1. Production-Based Phonetic Analysis

Production-oriented research represents the most established methodological tradition in accent studies. Within this paradigm, accent is typically examined through measurable deviations from target-language phonetic norms (Derwing, Munro, 2015; Kartushina, Hervais-Adelman, Frauenfelder et al., 2016; Maastricht, Krahmer, Swerts, 2021).

Researchers usually measure accent strength through acoustic parameters such as vowel formant values (F1 and F2), voice onset time, segment duration, consonant cluster realization, or prosodic features including pitch movement and rhythm. These measurements make it possible to quantify how closely second-language speech approximates native production patterns.

The theoretical foundations of this approach are closely connected with models of second language speech learning, most notably the SLM-r (Flege, Bohn, 2021). Within this framework, accent variation reflects the interaction between phonetic categories across languages and the degree to which new categories are established or restructured over time.

Methodologically, production studies often rely on controlled reading tasks, speech corpora, and comparisons with native-speaker baselines. Acoustic analysis software and statistical modelling allow researchers to measure the distance between L2 speech production and target-language norms with considerable precision.

The strength of this paradigm lies in its analytical clarity. It provides detailed information about which phonetic features differ from target-language patterns and therefore constitutes the structural substrate of accent. However, this approach also has clear limits: acoustic deviation alone does not explain how listeners perceive these features or how

they become socially meaningful in interaction. For this reason, production-based phonetic analysis should be viewed as the starting point rather than the endpoint of accent research. It identifies the phonetic material from which accent perception may arise but does not yet explain how that material is interpreted by listeners.

Recent interdisciplinary research underscores the value of integrating acoustic analysis into broader communicative modeling. Studies on speech polyinformativity conceptualize acoustic parameters as components of multilayered informational systems rather than isolated phonetic deviations (Potapova, Potapov, 2015), while recent computational and corpus-based approaches demonstrate how segmental and prosodic levels can be jointly modeled within structured analytical frameworks (Brown, Hellmuth, 2022). Furthermore, structured speech databases enable more systematic modeling of segmental and prosodic variation (Потапова, Потапов, 2018; Peralta-Rivera, Gil-Burgoin, Valenzuela-Miranda, 2025).

5.2. Perceptual-Experimental Paradigms

Perceptual paradigms shift the focus of analysis from the phonetic realization of speech to the way listeners process and interpret the signal. Within this framework, accent is typically examined through judgments of perceived accentedness, intelligibility, and comprehensibility. As demonstrated in the classic study by Munro and Derwing (1995), these constructs are empirically distinct and should not be treated as interchangeable. Perceived accentedness refers to the listener's judgment of how strongly a speech sample deviates from an expected phonetic norm. Intelligibility concerns whether the message can be correctly understood, whereas comprehensibility reflects the degree of effort required to process the speech signal. In practice, speech may remain fully intelligible while still being perceived as clearly accented.

For methodological purposes, it is therefore important to distinguish perceptual detection from social evaluation. A speech sample may be judged as strongly accented yet still receive neutral or even positive trait evaluations. Conversely, relatively mild phonetic deviation may trigger negative judgments if it aligns with salient stereotypes or contextual expectations.

Perceptual research commonly relies on rating scales, magnitude estimation, paired comparisons, categorical identification tasks, and reaction-time paradigms that help determine the point at which acoustic variation becomes perceptually noticeable. In some experimental designs, matched-guise techniques are also used to manipulate accent while controlling lexical and semantic content.

A recurring methodological issue, however, is that many speaker-evaluation studies collect accentedness or nativeness ratings together with social-trait evaluations within the same experimental session but treat them as parallel outcomes rather than modelling the pathway linking perception and evaluation (Nejjari, McQueen, Weber, 2020; Lybaert, Van Hoof, Deygers, 2024; Nejjari, Hout, Gerritsen et al., 2024). As a result, it often remains unclear what exactly drives evaluative effects – the degree of phonetic deviation itself, stereotype activation, contextual framing, or listener ideology.

Empirical evidence suggests that judgments of credibility and competence are frequently mediated by processing fluency and expectation congruence rather than by perceived accent strength alone (Lev-Ari, Keysar, 2010; Dragojevic, Dayton, 2025).

Within the multilevel architecture proposed in the present study, perceptual paradigms capture the stage at which phonological transfer becomes recognizable as accent in listener consciousness. In this sense, they form the main interface between measurable phonetic variation and its socio-cognitive interpretation, although they do not yet account for institutional consequences. For this reason, experimental designs should measure perceptual detection and social evaluation separately and explicitly model their statistical relationship.

5.3. Social Evaluation Paradigms

While production studies examine phonological transfer and acoustic realization, and perceptual paradigms focus on how accentedness becomes recognizable to listeners, research on social evaluation addresses the next stage of the process – how perceived accent influences judgments about the speaker. Within multilevel architecture, this line of research corresponds to the stage of social attribution and decision-making. In this paradigm, accent is treated not simply as phonetic deviation but as a socially meaningful cue that may shape attributions of competence, credibility, warmth, intelligence, status, or employability. A widely used methodological approach in this area is the matched-guise or verbal-guise technique, in which identical content is presented in different accent conditions in order to isolate the effect of pronunciation on social evaluation. Such designs make it possible to control semantic content while examining how listeners attribute social traits to speakers.

Experimental and field studies consistently show that foreign-accented speakers may receive lower ratings of credibility, competence, and hireability across institutional contexts (Lev-Ari, Keysar, 2010; Schmaus, Kristen, 2022; Maindidze, Randall, Martin-Raugh et al., 2025). These findings suggest that once accent becomes perceptually salient, it can activate socially available interpretive schemas that influence evaluative outcomes. At the same time, the severity of evaluation does not depend solely on the degree of acoustic deviation. Listener expectations, stereotype congruence, and institutional norms often play an equally important role.

From a sociolinguistic perspective, accent at this stage functions as an indexical cue that activates socially shared interpretive frameworks (Silverstein, 2003). Once recognized, phonetic variation becomes embedded in processes of social categorization and stereotype activation, shaping trait attribution in specific institutional settings. Importantly, these evaluations are highly context-dependent. Workplace research, for example, shows that accent bias varies depending on job type, role expectations, and the extent of required customer interaction (Hideg, Shen, Koval, 2024). In educational settings, accent may also influence teacher expectations, which in turn can affect students' longer-term academic trajectories (Kang, Rubin, 2012; Lorenz, Kogan, Gentrup et al., 2024).

Within the proposed model, social-evaluative paradigms therefore represent the stage at which accent functions most clearly as a socially consequential signal. At the same time, such evaluation presupposes earlier stages of perceptual detection and acoustic realization, confirming that accent effects emerge through a mediated process rather than through direct acoustic influence.

Methodologically, social-evaluative studies provide direct access to socially consequential outcomes and often achieve relatively high ecological validity in institutional contexts. However, they frequently rely on categorical accent manipulation and are not always linked to fine-grained phonetic analysis, which can limit explanatory precision and obscure the mechanisms that mediate between phonetic variation and social judgment.

Recent cross-domain analyses further suggest that accent bias is not limited to isolated interpersonal evaluations. Rather, it may function as a mechanism of cumulative "soft exclusion" embedded in institutional routines and symbolic boundary maintenance. In this sense, accent operates not merely as a perceptual deviation but as a socially legitimized filtering device across professional, educational, and service contexts. These observations indicate that social evaluation should not be treated as an isolated outcome variable but understood as the result of mediated socio-cognitive processes operating within structured institutional environments.

5.4. Cognitive-Processing Mechanisms

Production-based paradigms identify acoustic deviation, perceptual paradigms capture the recognition of accentedness, and social-evaluative designs measure resulting judgments about the speaker. Within the interference – accent – social signal framework, cognitive mechanisms correspond to the intermediate stage linking perceptual recognition with interpretive evaluation.

One influential explanation of accent effects is the processing fluency hypothesis. Speech perceived as more difficult to process tends to receive less favorable evaluations, even when intelligibility remains high (Lev-Ari, Keysar, 2010). Phonetic unfamiliarity may increase the cognitive effort required for phonetic decoding or lexical access, thereby reducing subjective fluency. Listeners may then attribute this increased effort to speaker-related characteristics, such as credibility or competence, rather than to properties of the speech signal itself. This process operates largely outside conscious awareness, meaning that accent effects may arise not only from explicit attitudes but also from automatic cognitive mechanisms.

This effect can be further explained within dual-process models of cognition (Kahneman, 2011). According to this framework, accent processing is initially governed by fast, automatic, and largely unconscious mechanisms (System 1), which rely on heuristic and associative processing. At this stage, phonetic cues such as accent may trigger immediate categorizations and affective responses without deliberate analysis. Heuristic processing may lead listeners to substitute complex evaluative judgments (e.g., speaker competence) with simpler perceptual impressions (e.g., ease of processing or familiarity of speech), a process described as attribute substitution (Tversky, Kahneman, 1974; Kahneman, 2011). Although slower and more analytical processing (System 2) may in principle correct such initial impressions, its involvement in everyday communication is often limited. As a result, accent-based evaluations are likely to be shaped primarily by automatic processes, contributing to the stability and reproducibility of accent-related biases.

At the same time, processing fluency alone cannot account for the full range of evaluative outcomes. Empirical studies show that strongly accented speakers may still receive positive evaluations on dimensions such as warmth or authenticity (Popova, 2021), indicating that cognitive effort interacts with socially stored expectations rather than determining evaluation in a direct way.

In addition to fluency-based mechanisms, accent may function as a cue for rapid social categorization. Experimental studies using implicit measures demonstrate spontaneous negative associations with non-native accents (Roessel, Schoel, Stahlberg, 2018), suggesting that accent can activate socially shared representations even when listeners do not consciously endorse such associations. These findings align with broader social-psychological accounts of accent stigma and intergroup categorization (Gluszek, Dovidio, 2010).

From the perspective of social cognition, accent may therefore operate as a heuristic signal of out-group membership. Once a speaker is categorized as "non-native" or "foreign", speech is interpreted through group-based expectations. This mechanism is consistent with indexical theory (Silverstein, 2003), according to which phonetic features acquire layered social meanings through repeated sociocultural association.

Importantly, stereotype activation is not uniform across contexts. Workplace studies indicate that accent bias varies depending on job requirements, communicative demands, and institutional expectations (Hideg, Shen, Koval, 2024; Maindidze, Randall, Martin-Raugh et al., 2025).

Taken together, these findings suggest a **dual-route mediation structure** (Figure 1). Acoustic deviation constitutes the initial perceptual input, which may activate two partially independent processing pathways.

Route A reflects cognitive fluency mechanisms: phonetic unfamiliarity increases processing effort, reduces subjective fluency, and may indirectly lower evaluations of credibility or competence. This pathway corresponds to general cognitive heuristics that link ease of processing with positive judgments.

Route B, in contrast, operates through social categorization mechanisms. Perceived non-nativeness activates group-based schemas that may trigger stereotype-consistent evaluations. In this case evaluative outcomes depend less on processing difficulty and more on the social meanings associated with the perceived accent.

These two pathways may operate independently or interactively. A mild accent, for instance, may not substantially increase cognitive load but may nevertheless activate salient social stereotypes. Conversely, unfamiliar phonetic patterns may increase processing effort without producing strong negative bias when listeners hold neutral or positive attitudes toward the indexed group.

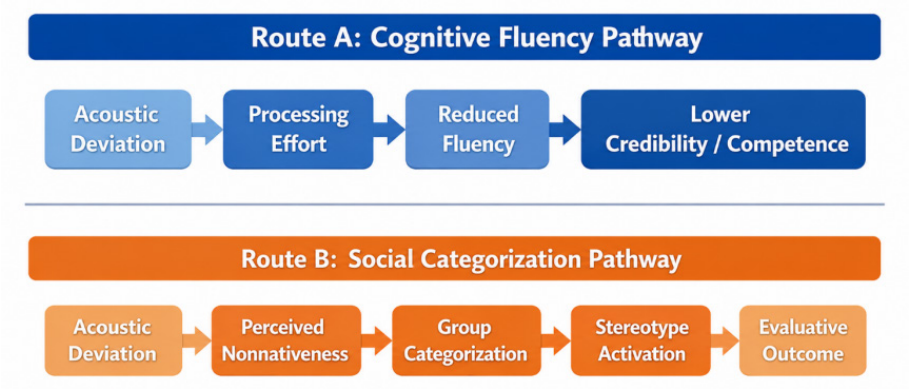


Figure 1. *Dual-Route Mediation Structure of Foreign Accent as Social Signal*

The dual-route model therefore emphasizes mediation rather than direct causation. Perceptual detection provides the initial input, but evaluative outcomes emerge only after transformation through either fluency-based heuristics or social-categorization mechanisms.

Empirical research in German-speaking contexts further demonstrates that vocal characteristics may influence not only immediate interpersonal judgments but also broader perceptions of institutional legitimacy and symbolic capital (Potapova, Potapov, Komalova, 2021). This suggests that the mediating processes described above extend beyond impression formation and may contribute to wider mechanisms of status attribution.

6. Integrative Multilevel Research Design

The preceding sections have shown that foreign accent cannot be fully understood within a single disciplinary perspective. Production-based phonetics identifies measurable acoustic deviations, perceptual research determines when these deviations become noticeable to listeners, social-evaluative studies examine the resulting judgments, and cognitive approaches explain the mechanisms that connect perception with evaluation. Considered separately, each of these approaches captures only one part of the process. Taken together, however, they make it possible to conceptualize accent as a socially meaningful signal that develops across several analytically distinguishable stages.

For this reason, the present study proposes an integrative research design that operationalizes the interference – accent – social signal trajectory as a multilevel analytical framework. The central idea is not to replace existing paradigms but to position them within a coherent structure that makes the relationships between phonetic variation, perception, cognitive mediation, and social evaluation more explicit. Such an approach is consistent with modeling as a methodological principle in the humanities, where complex phenomena are represented through structured, multi-level analytical systems (Горожанов, Гусейнова, Писарик, 2022; Горожанов, Красикова, 2024).

6.1. The Multilevel Accent-as-Signal Model

The proposed model conceptualizes foreign accent as a four-layer analytical structure (Table 1). Each level corresponds to a different stage in the transformation of phonological transfer into socially consequential evaluation.

Table 1. *Multilevel Analytical Architecture for Studying Foreign Accent as Social Signal*

Level	Analytical Focus	Core Variables	Research Tools
I. Production	Phonological transfer and acoustic realization	Formant values, voice onset time (VOT), prosodic contours, speech rate	Acoustic analysis, corpus phonetics
II. Perception	Detection of accentedness	Perceived accent strength, intelligibility, comprehensibility	Rating scales, magnitude estimation, forced-choice tasks
III. Cognition	Mediation mechanisms	Processing fluency, reaction time, implicit associations	Reaction time (RT) experiments, implicit association test (IAT), eye-tracking, structural equation modeling (SEM)
IV. Evaluation	Social attribution and institutional outcome	Competence, credibility, hireability, status, trust	Matched-guise experiments, field experiments, institutional data

This architecture reflects a sequential trajectory from phonological transfer to social evaluation, although the levels should not be understood as strictly linear. In actual communicative interaction these processes often overlap. Cognitive mediation may amplify or attenuate perceptual effects, and institutional norms may reshape or reinforce individual-level judgments.

The use of modeling in this context allows for the formalization of relationships between heterogeneous parameters and their integration within a unified analytical framework, which corresponds to approaches developed in contemporary linguistic modeling and corpus-based research (Горожанов, 2022).

Figure 2 illustrates this multilevel structure.

The vertical trajectory represents the transformation of phonological interference into socially consequential evaluation. At the same time, contextual moderators indicate that both perceptual thresholds and evaluative judgments are shaped by institutional expectations and language ideologies. In this sense, the model connects micro-level perceptual and cognitive processes with broader mechanisms of social differentiation.

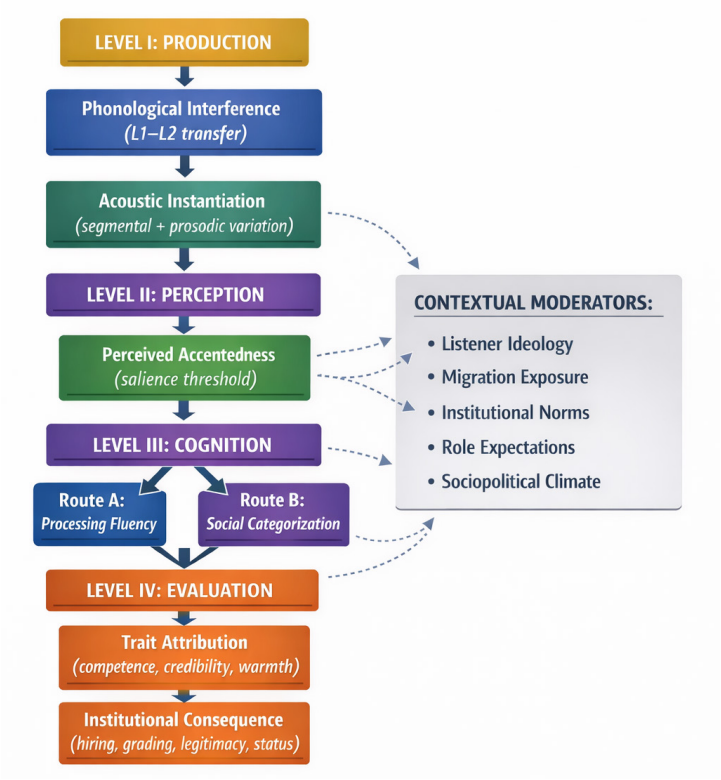


Figure 2. *Interference – Accent – Social Signal Model with Contextual Moderators*

6.2. Core Design Principles

If foreign accent is treated as a mediated social signal rather than as a purely phonetic deviation, research design must make these mediation stages analytically visible. Several methodological principles follow this assumption.

First, perceptual constructs should be clearly distinguished from evaluative judgments. In many studies, perceived accentedness and social-trait ratings are collected in the same experimental session and then used as if they reflected one and the same underlying phenomenon. This practice masks possible mediation effects and can create the false impression that acoustic deviation directly determines social evaluation.

Second, analytical models need to move beyond simple correlations. Mediation-based approaches make it possible to test specific pathways, for example: whether perceived accentedness mediates between measurable phonetic distance and social evaluation; whether processing fluency mediates between perception and attribution; and whether stereotype-related variables moderate evaluative outcomes independently of accent strength. In practical terms this means that experimental designs should include both phonetic and socio-cognitive measures rather than privileging one of these levels.

Third, institutional context should be treated as an active component of the design, not merely as background description. Communicative expectations in hiring, educational, customer-service, or legal settings differ markedly, and these differences influence how strongly accent is noticed, how it is evaluated, and which consequences follow from that evaluation (Hideg, Shen, Koval, 2024; Maindidze, Randall, Martin-Raugh et al., 2025). For this reason, contextual variables need to be built into the research design from the outset, for instance through scenario manipulation or the inclusion of domain-specific tasks.

And finally, accent should not be reduced to a binary category such as “native vs. non-native”. A more informative strategy is to model segmental and prosodic parameters and to examine which of them become perceptually salient and socially diagnostic in concrete interactional settings. Such fine-grained operationalization allows us to identify those features that function as carriers of social meaning, rather than treating accent as an undifferentiated label.

Overall, these principles help to relate micro-level cognitive mechanisms to broader institutional outcomes. Processing fluency and stereotype activation help explain how accent shapes immediate impressions of a speaker, whereas repeated evaluative decisions in hiring, grading, promotion, or service encounters may gradually accumulate into durable patterns of inequality. From this perspective, accent bias is not simply an individual perceptual error but a stabilized mechanism through which small perceptual preferences can be converted into longer-term forms of social differentiation.

Conclusion

The conclusions of the present study follow from the systematic resolution of the research tasks and provide a coherent account of foreign accent as a multilevel phenomenon.

The analysis clarifies the conceptual distinction between interference and accent by defining interference as a production-level mechanism of cross-linguistic phonological transfer, observable in segmental and prosodic deviations, while accent is understood as its perceptually recognized and socially interpreted manifestation. This distinction demonstrates that accent does not reside in the speech signal itself but emerges through listener-mediated processing, thereby reframing it as a perceptual and socially meaningful construct rather than a purely phonetic deviation.

The systematization of methodological paradigms shows that dominant approaches to accent research correspond to four analytically distinct yet interrelated levels: phonetic (acoustic realization), perceptual (accentedness, intelligibility, comprehensibility), cognitive (processing and categorization), and socio-evaluative (attribution of competence, credibility, and status). Considered in isolation, these approaches remain methodologically limited; however, their alignment reveals a sequential relationship in which each level provides the input for subsequent stages of processing.

The study further identifies specific mediation mechanisms linking perceptual salience to social evaluation including: (1) processing fluency whereby increased cognitive effort leads to reduced evaluative favorability; (2) attribute substitution through which complex judgments are replaced by simpler perceptual impressions; (3) implicit stereotype activation whereby accent cues trigger socially shared representations; (4) and heuristic categorization which enables rapid classification of speakers based on perceived group membership. Taken together, these mechanisms explain why evaluative outcomes depend not on acoustic deviation per se but on its cognitive processing and interpretive framing.

The integration of theoretical and empirical findings results in a coherent multilevel analytical model explicitly structured as a four-stage sequence: phonetic realization → perceptual salience → cognitive interpretation → social attribution. Each level is connected through specific mediation processes, including recognition of accentedness, processing fluency, attribute substitution, implicit stereotype activation, and heuristic categorization, which collectively transform acoustic variation into socially meaningful judgments. This model provides a methodological basis for tracing how phonological transfer becomes socially consequential and offers a framework for explaining how micro-level perceptual processes may scale up to macro-level patterns of social evaluation and institutional differentiation.

For further research it seems important to empirically test the proposed framework using concrete language pairs and institutional contexts. Particular attention should be paid to identifying those segmental and prosodic features that most consistently become carriers of social salience and to examining how their effects unfold in real communicative situations. Such work would make it possible to assess how phonetic variation is perceived and interpreted across different settings, and how these perceptions influence evaluative decisions over time. In this regard, longitudinal and exposure-based designs appear especially promising, as they allow researchers to observe processes of perceptual adaptation and recalibration in listeners (Hendriks, Meurs, Wolf, 2025). At the same time, future studies would benefit from multimodal and cross-linguistic approaches that integrate prosodic, gestural, and contextual variables. From this perspective, micro-level processes of perception can be directly related to broader patterns of social differentiation.

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Информация о статье | About this article

Дата поступления рукописи (received): 03.03.2026; опубликовано online (published online): 03.06.2026.

Ключевые слова (keywords): иноязычный акцент; восприятие акцента; когнитивная обработка речи; социальная категоризация; фонологическая интерференция; лингвистический корпус; foreign accent; accent perception; processing fluency; social attribution; phonological transfer (interference); linguistic corpus.