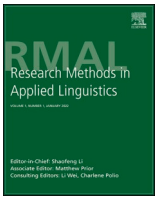
Research Methods in Applied Linguistics 3 (2024) 100164

Contents lists available at ScienceDirect

Research Methods in Applied Linguistics

journal homepage: www.elsevier.com/locate/rmal



Profiling learner development with a computerized dynamic assessment of a Japanese learner's L2 email writing

Allan Nicholas *, John Blake

University of Aizu, Japan

ARTICLE INFO

Keywords:
Dynamic assessment
Pragmatics
Email writing

ABSTRACT

This study evaluates a computerized dynamic assessment (C-DA) method's potential to build a detailed pragmatics-focused developmental profile of a Japanese L2 English learner's L2 email writing. L2 email writing studies typically separate learning and assessment, using holistic scales to evaluate the pragmatic elements of learner texts. C-DA, grounded in sociocultural theory, unifies learning and assessment, administering email tasks with varying social contexts and providing immediate mediation within the learner's zone of proximal development (ZPD). Further, a diagnostic capacity allows for identification of specific pragmatics-related infelicities. The C-DA employs a dual-layered framework: an identification layer uses a coding scheme to automatically identify specific instances of perceived pragmatic inappropriateness, while the mediation layer provides ZPD-sensitive mediation. By evaluating the frequency and explicitness of mediation engaged in, in combination with qualitative examination of elicited email texts, the C-DA enables insights into learner development within the ZPD. We focus on an individual learner's interaction with the C-DA, evaluating the program's effectiveness in enabling a detailed learner diagnostic and developmental profile.

1. Introduction

While a genre of writing, emailing shares the characteristic of interactivity with some forms of oral communication. There are interlocutors, with a sender and receiver, and, as a turn in a conversation may be preceded or followed by an interlocutor's turn, emails may be embedded in a thread. Therefore, in composing an email, the sender must attend to the pragmatics element of the communication, concerning the social context of the interaction and its potential effect on language choices (Ishihara & Cohen, 2022). Diverging from the relevant community's expected norms may lead to negative perceptions of the sender by the receiver (Economidou-Kogetsidis et al., 2020; Hendriks et al., 2023; Nicholas et al., 2023), with potential ramifications for relationships (Economidou-Kogetsidis et al., 2020; Hendriks et al., 2023).

L2 English emailing is important for learners in many contexts, including that of this current study (a Japanese university; Nicholas et al., 2023), allowing them to communicate while reducing the pressure of producing the L2 in a real-time context (Economidou-Kogetsidis, 2011). It is important, therefore, to investigate the effectiveness of pragmatics-focused instruction and feedback in order to address learner needs. However, we argue there are two key methodological issues with investigations of pragmatics and L2 email writing to date: the separation of learning and assessment, and the use of holistic scales to measure perceived pragmatic appropriateness. L2 email writing studies have primarily followed a bifurcated approach to learning and assessment,

* Corresponding author at: University of Aizu, Tsuruga, Ikki-machi, Aizu-wakamatsu City, Fukushima, 965-8580, Japan.
E-mail address: anich@u-aizu.ac.jp (A. Nicholas).

https://doi.org/10.1016/j.rmal.2024.100164

Available online 30 October 2024

evaluating learning via pre- and post-intervention assessments (Chen, 2015; Nguyen et al., 2015; Nguyen, 2018; Uso-Juan, 2022). From a sociocultural perspective (Vygotsky, 1978), this approach, while evaluating a learner's current independent performance, provides less insight into abilities still in the process of maturation. Further, the use of holistic scales by expert raters to judge learner texts has been a common approach (Chen, 2015; Economidou-Kogetsidis et al., 2020; Nguyen et al., 2019; Savic, 2018), capturing general perceptions of pragmatic appropriateness. Studies have often combined this with a separate analysis of text pragmatic features, allowing for relationships between perceptions and text features (or absence thereof) to be identified. However, this provides limited specificity into features raters consider inappropriate.

Adopting a sociocultural-theoretical (SCT) lens on development through the application of a computerized dynamic assessment (C-DA; Poehner et al., 2015) allows for the addressing of both issues, bringing together learning and assessment, and enabling the identification of specific pragmatic issues through learner interaction with the program. We develop and apply a C-DA to a university-level Japanese learner's L2 English email writing. Dynamic assessment (DA), grounded in a SCT perspective on development, in which the social dimension of learning is fundamental, focuses on learner performance in collaboration with a skilled other, or program (Vygotsky, 1978; Poehner, 2008). While in previous non-dynamic studies, evaluation is carried out pre- and post-intervention, C-DA unifies learning and assessment, simultaneously providing feedback – henceforth referred to as mediation – to a learner while carrying out a task, and evaluating the mediation given for evidence of development. Further, in contrast to holistic approaches, a DA typically has a diagnostic capacity, meaning that it aims to identify specific issues that can then usefully inform further future instruction (Poehner, 2008). The concept of the zone of proximal development (ZPD; see Section 2.1) is of central importance in C-DA, and can be practically defined as the developmental space between what a learner can achieve with assistance, and what can be achieved without (Aljaafreh & Lantolf, 1994). From this sociocultural perspective, mediation is most likely to be reliably effective when it falls within a learner's particular ZPD. To this end, therefore, it should be both contingent on need and graded – the most implicit form of mediation is provided that allows a learner to successfully resolve a pragmatic issue (Aljaafreh & Lantolf, 1994; Qin & van Compernolle, 2021).

A number of studies have begun to investigate DA methodology in regards to L2 language learning (Poehner, 2008; Ableeva, 2010; Nicholas, 2020). However, the potential for DA application in relation to L2 email writing pragmatics has yet to be explored. In this study, we evaluate the effectiveness of a C-DA in enabling the detailed pragmatics-focused developmental profiling of a Japanese L2 English learner's L2 email writing. The C-DA unifies assessment and learning by administering a set of collaborative tasks and engaging in automated mediation. A framework is applied that identifies specific aspects of email pragmatics the learner finds challenging, and tracks the mediation engaged in. Both a quantitative analysis of learner mediation scores and a qualitative analysis of elicited email text data are provided to evaluate the effectiveness of the analytical framework in capturing pragmatic development – demonstrating awareness and understanding of the target community pragmatic norms – through a sociocultural lens. Specifically, focusing on a single learner, we evaluate the extent to which the C-DA i) allows for the building of a detailed learner profile regarding specific perceived pragmatic infelicities; and ii) shows evidence of development over time.

Therefore, in developing a C-DA focusing on email pragmatics, we address a number of methodological issues. The SCT lens allows for an approach that aims to provide insights regarding abilities still in the process of development. Further, in keeping with DA methodology, we develop a diagnostic function, in which specific areas of learner difficulty are identified. Importantly, this identification is directly connected to the mediation. Finally, by computerizing the DA, we address the issue of efficiency, allowing for large numbers of learners to interact with the DA simultaneously (Poehner et al., 2015). Here, we explore this alternative methodology in relation to L2 email writing and its ability to allow for the profiling of a learner's pragmatic development.

2. Background

2.1. Dynamic assessment

Dynamic assessment (DA) is an alternative methodological approach to pragmatics-focused L2 email studies to date. DA unifies assessment and learning, allowing for insights into learner development. Further, a diagnostic function enables identification of specific pragmatic infelicities learners may encounter. DA is grounded in a sociocultural-developmental perspective on learning, in which the focus of interest is on not only the individual aspects of development but also the interpersonal (Vygotsky, 1978; Lantolf & Appel, 1994). From this perspective, learning has a key collaborative component, with a learner developing abilities through mediation with a skilled other. As a learner gradually internalizes this ability, they move towards independent performance (Kozulin & Garb, 2002).

The sociocultural concept of the *zone of proximal development* (ZPD; Vygotsky, 1978) underpins DA, and can be defined as the space between independent performance (in sociocultural terms *self-regulation*), and what can be accomplished when collaborating with expert guidance (*other-regulation*; Vygotsky, 1978). For mediation to be reliably effective in promoting development in a learner, enabling internalization of the target ability, it should fall within this ZPD developmental space, and should, therefore, be both *graded* and *contingent* (Aljaafreh & Lantolf, 1994; Poehner, 2008; Nicholas, 2020). This means that the minimal amount of mediation should be provided as possible, that still allows the learner to proceed with an activity. Typically, this entails initially highly implicit mediation, such as prompts, to signify an issue. Should this prove insufficient, further mediation is provided in a graded manner, incrementally becoming more explicit until the issue is resolved and the task can continue. Further, mediation should be contingent – only provided when necessary. In this way, we can see that the ZPD concept collapses the implicit-explicit intervention dichotomy present in previous studies, and offers an alternative approach in which intervention is grounded in a sociocultural perspective, adapting to a learner's particular developmental needs.

DA leverages the ZPD concept to unify learning and assessment, providing insight into learner development (Poehner, 2008; Poehner & Lantolf, 2024), and rests on three core tenets. The first relates to modifiability – the potential for mediation to intervene in a learner's developmental trajectory; second, the importance of both assessment and learning, and third, the importance of a diagnostic capacity that can identify causes of learner difficulty, informing further instruction (Lidz & Gindis, 2003). DA aims to bring about this unity of assessment and learning by both evaluating a learner's abilities and simultaneously promoting their development via mediation falling within the ZPD (Poehner, 2008).

In a DA, a mediator and learner collaborate on a task (Nicholas, 2020; Poehner, 2008; Poehner & Lantolf, 2024). When a difficulty is encountered, the interlocutors may initiate a sequence of mediation, working towards a resolution (van Compernolle, 2013). During this sequence, mediation is ZPD-sensitive, being initially implicit, increasing in explicitness until the issue is resolved and the task resumes. By providing graded and contingent mediation, development is promoted, allowing the learner to move towards greater self-regulation (Poehner, 2008; Qin & van Compernolle, 2021). Further, development can be assessed by evaluating mediation frequency and explicitness. Explicit mediation, for instance, may indicate a learner is closer to other-regulation within their ZPD; conversely, the absence of mediation, or presence of only implicit forms may suggest the learner is closer to self-regulation (Nicholas, 2020; Poehner, 2008). Both within a particular DA session, or across sessions, less frequent and explicit mediation over time is seen as an indication of development. By focusing, therefore, on collaborative tasks rather than learner independent performance, insights can be uncovered that may not be seen in non-dynamic approaches (Poehner, 2008).

Two DA methodological variants have been identified – *interactionist* and *interventionist* (Lantolf & Poehner, 2004; Poehner & Lantolf, 2024). With the former, a mediator and a learner collaborate on a task, with mediation unscripted. The mediator responds flexibly to the particular needs of the learner in the moment; interventionist DA, however, standardizes mediation, with moves scripted (Qin & van Compernolle, 2021). Interactionist DA may be closer to sociocultural conceptions of the ZPD and effective mediation (Poehner, 2008); while interventionist forms sacrifice flexibility to some extent, advantages may include a reduced need for mediator training and, thus, increased efficiency (Poehner, 2008; Qin & van Compernolle, 2021).

DA methodologies have been criticized with respect to reliability (Glutting & McDermott, 1990; Poehner, 2008), in that the unification of learning and assessment means that the object of assessment is being affected by the assessor. In non-dynamic testing contexts, this would, therefore, negatively affect reliability. Further, in unifying learning and assessment and in the unscripted nature of interactionist DA, its generalizability has been questioned (Poehner, 2008), as mediation in each DA will be particular to each individual learner's needs. Poehner and Lantolf (2010) address this by highlighting fundamental differences between non-dynamic and dynamic perspectives on development. While non-dynamic approaches assess the learner in isolation, DA asserts the modifiability of development, with future potential being made visible through the collaborative process. Rather than being focused on generalizability, DA focuses on development of the learner, which is of primary importance (Poehner, 2008). A third issue relates to efficiency; interactionist DA methodology offers flexibility and responsiveness to a learner's needs (Poehner, 2008); however, this comes at the cost of time and human resources, with the need for mediator training, time for DA sessions, and also in analysing DA session data (Poehner et al., 2015; Qin & van Compernolle, 2021). Interventionist DA can be seen as a response to this, sacrificing a degree of flexibility for efficiency (Poehner, 2008).

The challenge, therefore, is how to widen access to DA methodologies, including in large learner-group contexts (Qin & van Compernolle, 2021), while still retaining the benefits of the methodology. C-DA offers one potential avenue in this regard. Interactionist DA approaches are challenging to implement in computerized form, due to their non-standardised nature; interventionist approaches, however, have proved amenable to automation, and have thus been the focus of C-DA studies to date.

A C-DA involves a learner collaborating on a task with a program, rather than a person. Poehner et al. (2015) suggest three principles of C-DA: mediation should be grounded in a sociocultural perspective on development. Second, *transfer* (Poehner et al., 2015; Qin & van Compernolle, 2021) – the C-DA should administer a variety of tasks that challenge the learner in differing ways, evaluating their ability to apply their knowledge to varying contexts. This concept has been applied in both DA (Ableeva, 2010; Nicholas, 2020) and C-DA contexts (Qin & van Compernolle, 2021). Third, a C-DA should be efficient, in that it should address the time and resource-intensive nature of traditional in-person DA, and, thus, be available to a wider number of teachers and learners.

2.2. DA and language learning

While DA methodologies have become the focus of increasing interest in second language learning (Poehner et al., 2015; Tang & Ma, 2023), there has been little investigation to date in relation to pragmatics. Regarding in-person DA, van Compernolle and Kinginger (2013) employed an interactionist approach, evaluating French L2 learners' metapragmatic conceptual knowledge of pronoun usage. The mediator collaborated with learners on appropriateness judgement questionnaire items, in which the learners chose pronouns for varying social contexts, explaining their choices. Interactions were qualitatively examined, focusing on mediation sequences. Neither the identification of learner problems or the mediation types were organized into a formalized coding scheme; rather, analysis was qualitative, examining the interactions closely for how the mediator engaged in mediation with the learner, and how learner understanding developed across time.

Nicholas' (2020) interactionist DA study of Japanese L2 English learners oral requesting-in-interaction collaborated with participants in role-play type tasks. The mediator employed a *cognitive map* (Feuerstein et al., 1979) as a mediating aid in identifying learner challenges during the interactions, with the map including target concepts of Power (P), Distance (D) and Rank of imposition (R) (Brown & Levinson, 1987) and typical aspects of requesting talk, as identified through conversation analysis research. This map was also used to inform the coding of the transcript data, in combination with analysis of mediation, assigning a numbered score depending on the degree of explicitness, allowing for quantification of learner movement within the ZPD.

Only recently has C-DA been investigated with regards to language learning, with little research focusing on pragmatics. Qin and van Compernolle (2021) applied interventionist DA methodology to implicature comprehension in L2 English learners. Multiple-choice items were employed as the task, with three mediation levels implemented. Due to the restricted, multiple-choice nature of the task, a detailed coding scheme was not required to identify learner challenges. Analysis focused on mediation; an *actual score* was assigned to learners' initial answers and a *mediated score* which varied depending on the level of mediation provided. In this manner, the researchers were able to compare independent and assisted performances, tracking development.

To date, only Nicholas et al. (2024) have applied C-DA to the pragmatics aspect of email writing. While they quantitatively analyse large group aggregate data, here, we qualitatively evaluate the capacity of a C-DA's analytical framework to build a detailed profile of an individual learner's development across time. To apply a C-DA to whole email texts, a framework with two layers is developed: the first identifies specific aspects of the text perceived to be inappropriate; the second applies four levels of mediation to the identified issues, assigning scoring to allow for tracking of learner movement within the ZPD.

2.3. L2 email and pragmatics

Email is commonly used in both academic and business contexts (Chen, 2015; Nicholas et al., 2023). Pragmatics, the aspect of overall communicative competence in which contextual factors bear upon our linguistic realisations (Ishihara & Cohen, 2022), has been primarily studied in oral contexts, but it also plays a role in email communication due to its asynchronous yet interactive nature (Economidou-Kogetsidis, 2011, 2016). In composing an L2 English email, awareness of *pragmatic norms* – "within a culture or community…socially acquired and jointly constructed knowledge of more or less acceptable behavior" (Ishihara & Cohen, 2022, p.2)– is important. In a world of global English variants, it should be noted that such norms are not necessarily equivalent to native speaker norms, but rather those belonging to the particular relevant community to the learner. A learner must take into account a range of factors, including *power* (P; relating to relative social status), *social distance* (D; the degree of familiarity) and *rank of imposition* (R; the degree to which a request, for instance, may impose a burden on the receiver; Brown & Levinson, 1987). These factors become increasingly important in inherently face-threatening acts like requesting (Brown & Levinson, 1987), with their potential to cause social discomfort for both the sender and the receiver. The complexity of composing pragmatically appropriate emails, therefore, is considerable for learners, with L2 emails often diverging in pragmatic features from those typically produced in the relevant community (Economidou-Kogetsidis, 2011, 2015; Nicholas et al., 2023).

The pragmatic elements of an email have typically been captured through two analytical perspectives – one informed by Blum--Kulka and Olshtain (1984)), and one in which an email is categorized into "framing" and "content" moves (Bou-Franch, 2006; Chen, 2015). The former approach describes speech acts such as requesting in terms of strategies modifying directness within a head act (the portion of text in which the actual request is produced) and outside of it (Economidou-Kogetsidis, 2011, 2016). Economidou-Kogetsidis (2011; 2016) applied an analysis of L2 English email requests, identifying request head act directness. Strategies were categorized in terms of direct request types, including the use of *imperatives* ("give me the information…"), *want statements* ("I want you to…") and *need statements* ("I need you to…") and conventionally indirect strategies including *query preparators*, (*can/could you…*; "*I would appreciate it if…*"). Non-conventionally indirect strategies, on the other hand, consist of hints, in which the receiver is expected to comprehend the sender's intended meaning. An additional category identifies *internal modifiers* within a head act, mitigating the request's directness, including the use of *consultative devices* ("*is it possible…"*) and *subjectivisers* ("*I wonder…"*). While technically "*Please"* can increase the directness of the head act by clearly signifying it is a request, it may also serve to mitigate the force of a request to an extent. *External* modifiers, on the other hand, identify strategies outside of the head act that also soften directness, including greetings, self-introductions and closings.

An email can also be conceptualized in terms of framing and content moves (Bou-Franch, 2006; Chen, 2015; Uso-Juan, 2022). The former refer to more organizational aspects, namely openings and closings. An opening may comprise a *greeting* ("Dear…"), the receiver's name, and a self-introduction, depending on familiarity. A closing, in which the sender transitions from communicating to ending the communication (Chen, 2015), can include a number of moves. We use the term *pre-closing* in the context of this study to refer to strategies, often conventionalized, serving to segue from the email body to the closing (*"Thankyou, and I look forward to hearing from you…")*, a *complementary closing* ("*Sincerely…*"), and the sender's name (Chen, 2015; Uso-Juan, 2022; Nicholas et al., 2023). Content moves relate to the email's purpose (e.g. requesting). In identifying content moves, descriptions of strategies by Blum-Kulka and Olshtain (1984)) can be employed (Economidou-Kogetsidis, 2016). The two conceptual approaches can, therefore, be complementary. Nicholas et al. (2023), for instance, synthesized the two into a framework allowing for identification of perceived pragmatic inappropriateness in Japanese learners' English emails.

Studies have primarily followed two lines of investigation. The first are non-intervention perception studies of learner L2 emails' pragmatic appropriateness (Economidou-Kogetsidis, 2011, 2016; Economidou-Kogetsidis et al., 2020; Savic, 2018; Nicholas et al., 2023). A second line of investigation evaluates learner responsiveness to pedagogical intervention (Chen, 2015; Nguyen et al., 2015; Nguyen, 2018; Uso-Juan, 2022). We first provide an overview of non-intervention studies, and their common approach to capturing perceptions of pragmatic appropriateness via the use of holistic scales. We then outline intervention study methodologies, identifying commonalities regarding analytical approaches, study design, and pedagogical interventions. We then outline the limitations of these approaches from a sociocultural perspective, before discussing alternative, socioculturally-grounded methodologies.

Various studies have investigated receiver perceptions of email texts, typically employing perception questionnaires to holistically evaluate pragmatic appropriateness. This is often combined with analyses of text data for pragmatic features, providing insight into linguistic factors influencing perceptions. In an early example of this approach, Hartford and Bardovi-Harlig (1996) elicited perception data on both L1 and L2 English request-based emails sent to university faculty, in terms of whether the receivers evaluated the texts

positively or negatively. Request imposition was also evaluated and the linguistic forms employed to produce the requests, allowing for linguistic differences between negatively and positively perceived texts to be identified, and also the role of imposition in influencing perceptions.

Economidou-Kogetsidis (2011) and Economidou-Kogetsidis et al. (2020), investigating L2 English requesting emails to university faculty, employed perception questionnaires with 5-point Likert scales to capture perceptions of pragmatic appropriateness, supplemented with additional, voluntary open-ended questions. This was combined with analysis of email texts for pragmatic features, using an adapted coding scheme based on CCSARP (Blum-Kulka & Olshtain, 1984). Similarly, Cheng (2017) elicited perceptions from university faculty receivers regarding email apologies. Participants evaluated the emails holistically for "communicative effectiveness" via Likert scales with optional open-ended questions eliciting the reasoning for their evaluations.

Savic (2018), investigating perceptions of university students' L2 email pragmatic appropriateness in an English as lingua franca context, employed a perception questionnaire with holistic scales, evaluating whole texts, focusing on directness and overall appropriateness. As with Economidou-Kogetsidis (2011) and Economidou-Kogetsidis et al. (2020), texts were also coded for features, providing insights into factors impacting perceptions. Lazarescu (2020) focused on request-based L2 English emails in a Spanish university context. As with previous studies, the researcher both analysed the requests, following Economidou-Kogetsidis's (2011) adapted CCSARP coding scheme, and also faculty perceptions of pragmatic appropriateness. Regarding the latter, formality, appropriateness, politeness and the effect on the receiver's feelings towards carrying out the request were elicited, using Likert scales with the option of writing details below each score.

Winans (2020), in a similar approach, investigated the effects of modifiers in request head acts on perceptions of politeness by university faculty email receivers. Email texts were collected from both L1 and L2 English users, and the head acts coded for the presence of modifiers. In evaluating politeness, a 6-point Likert scale was employed, with raters relying on intuition to score texts. Scores were then compared against the use of modifiers, to evaluate their possible effects on perceptions. Likewise, Hendriks et al. (2023) combined perception questionnaire data from L1 and L2 English user email receivers, with email texts with varying senders (L1 or L2 users) and use of modifiers in the head acts, allowing for a comparison of L1 and L2 perceptions and influencing factors.

The above studies (Economidou-Kogetsidis, 2011; Economidou-Kogetsidis et al., 2020; Hartford & Bardovi-Harlig, 1996; Hendriks et al., 2023; Lazarescu, 2020; Savic, 2018; Winans, 2020) combined the use of perception questionnaire data with separate analyses of pragmatic features present in texts, in order to draw conclusions as to text features influencing perceptions. An alternative approach can be seen in Nicholas et al.'s (2023) investigation of Japanese EFL learners' English emails, which analysed elicited email texts for specific perceived instances of inappropriateness. Rather than capturing holistic perceptions with a separate analysis of pragmatic features, the two analyses were essentially combined, with raters annotating learner email texts using a coding scheme adapted from Economidou-Kogetsidis' (2011; 2016) to capture specific text aspects perceived to be inappropriate. This allowed for granular analysis of learner challenges in relation to both framing and content moves.

Studies investigating learner responsiveness to intervention in L2 English email writing also typically employ holistic scales to judge pragmatic appropriateness. Further, they employ a pre-test – post-test design, separating assessment and instructional phases; they are not situated within a theoretical-developmental perspective on learning, and they focus primarily on explicit forms of pedagogical interventions.

Chen (2015), following a pre-test, post-test design, investigated the effectiveness of explicit instruction in leading to changes in pragmatic performance among Chinese learners of English, employing a 4-point scale to assess perceived pragmatic appropriateness. Similarly, Nguyen et al. (2015) employed a pre- and post-test approach focusing on Vietnamese learners' emails and the effects of explicit feedback on pragmatic performance, using a 5-point holistic scale to evaluate texts. The scale focused on pragmatic appropriateness in relation to the text goal, register, overall email discourse, and language usage. A further scale was used to judge learners' awareness of pragmatic aspects of email composition, using multiple choice questions. Nguyen (2018) and Nguyen et al. (2019) also employed holistic scales to evaluate the longitudinal effects of feedback, and revision opportunities, respectively. The pre- and post-test design is also used by Uso-Juan (2022), employing a similar 5-point scale.

A number of these studies also apply a qualitative analysis of text data, identifying specific pragmatic features present in texts (Chen, 2015; Nguyen, 2018, 2019; Uso-Juan, 2022). It is to be noted that the analyses involved identification of pragmatic *features*, not perceived instances of *inappropriateness*. Further, the identified pragmatic aspects did not inform the intervention phase, in keeping with the intentional separation of assessment and learning via pre- and post-tests.

Focusing on intervention, we see a variety of approaches taken; however, there is a shared focus on explicit forms of instruction and feedback. Explicit instruction – the provision of direct instruction on metapragmatic information regarding norms, or the provision of linguistic resources enabling learners to express pragmatic meaning (Ren et al., 2022) – is in contrast with implicit forms, in which, for instance, the learner may be encouraged to deduce norms from example email texts (Ren et al., 2022). Exemplifying this approach, Chen (2015) employed explicit instruction over a six-hour period, in which salient aspects of emailing were introduced. Nguyen et al. (2015) investigated two types of feedback – direct explicit feedback, and metapragmatic feedback, while Nguyen (2018) also employed metapragmatic instruction. Uso-Juan (2022) employed a strategy-based form of explicit instruction in which participants were able to draw upon various resources to aid their writing. All of the above studies' interventions are explicit in nature; the role of implicit or varying feedback types, is not investigated. There is also no clear developmental-theoretical approach to intervention; while, for instance, Nguyen et al. (2015; 2019) offered revision opportunities following feedback, the nature of the feedback appears to be unaltered on each occasion.

In the following methods section, we provide a detailed overview of the study context, the tasks, analytical frameworks and C-DA administration.

3. Methods

In this study we focused on one specific learner in order to answer the following research questions: to what extent does the C-DA

(1) allow for the building of a detailed learner profile with regards to specific perceived pragmatics-related challenges they encounter?
(2) show evidence of development over time?

To answer the above, we combined quantitative and qualitative approaches to analysis.

This section outlines our methodological approach, beginning with the creation of the C-DA. We then describe our adoption of a case study approach to build a learner profile, tracking evidence of development within the ZPD across time.

3.1. C-DA

In this subsection, we describe the design, development and administration of the C-DA, which comprised five phases, namely task scenario development, coding scheme development enabling pragmatic infelicity identification, algorithm creation and testing, feedback creation, and the building of the system architecture.

3.1.1. Phase 1: scenario and task development

The scenario and task development were first undertaken to ensure the relevance of the email tasks to the target student population (see Nicholas et al., 2023 for a detailed description.) This involved four steps: (1) initial exemplar generation from the target population; (2) frequency count analysis of elicited questionnaire data; (3) drafting of tasks and assignment of P, D and R values; and (4) task moderation. First, scenarios were elicited from a representative sample ($n = 108$) of the target student population using a questionnaire to gather realistic and relevant situations from their lives. The elicited scenarios included both academic and personal settings. Second, the frequency of each elicited scenario was counted and ranked by frequency. The scenarios with the highest frequency were utilized as templates to guide the task creation process. Third, a set of twelve task scenarios was then created, with each task assigned P, D and R values by the researchers. Our definitions of the values are adapted from Hudson et al. (1995), with P+ and P- referring to the rank, title or social position of the receiver being higher or lower than the sender respectively. D refers to whether the sender and receiver know each other (D-) or not (D+), while R relates either to the receiver needing to use a large amount of energy or goods to carry out a request (R+) or a small amount (R-; Hudson et al., 1995).

The task scenarios were grouped into four different value combinations, with the same four combinations appearing in both C-DA sessions (C-DA1 and C-DA2). This provided the opportunity for the learner to vary his pragmatic choices, and adhered to the DA transfer concept. Table 1 shows P, D, and R values for each task along with the email recipient (full task scenarios are available in Appendix A). Fourth, expert users of English moderated the tasks for validity. Specifically, they ensured the tasks elicit the request act, the request act aligns with the assigned values and the wording of the task was clear and concise. Each of the rounds of administration comprised four tasks, and so eight tasks were used in total. Finally, previous studies do not provide a clear picture of which combination of values tend to be more or less challenging for learners (Economidou-Kogetsidis, 2016; Nicholas et al., 2023); as such, task order was chosen randomly. The same task order was used in the first round (C-DA1) and second round (C-DA2) for consistency, and is shown in Appendix A.

3.1.2. Phase 2: pragmatic infelicity identification

The coding scheme for identification of pragmatic infelicities is based on a specialised corpus study of perceived pragmatic inappropriateness in the email request writing of Japanese learners of English (Nicholas et al., 2023). In Nicholas et al.'s (2023) study, a Japanese learner corpus of approximately 1300 request email texts was compiled, annotated for particular perceived instances of pragmatic infelicities by expert English users. The evaluators, who were relevant community members, being faculty members of Japanese universities, annotated the corpus following a coding scheme adapted from the coding categories of Economidou-Kogetsidis (2011, 2016), which were in turn based on Blum-Kulka and Olshtain (1984)). Intra- and inter-rater reliability checks were conducted to validate annotation consistency. Additionally, specialised informants were employed who were relevant members of the target community (a student and administrative member of staff at the institution) to ensure that annotator perceptions aligned with those from the wider community.

Fig. 1 shows the finalized coding scheme used in the C-DA identification layer. A notable difference between this coding scheme

Table 1
Administered tasks.

	Email recipient		Contextual variables		
	C-DA1	C-DA2	Power (P)	Social distance (D)	Rank of imposition (R)
PDR+++	Local business owner	Professor	+	+	+
PDR ++ -	University administrative officer	Local business owner	+	+	–
PDR - - +	Friend	Friend	–	–	+
PDR - - -	Friend	Friend	–	–	–

and the corpus analysis reported in Nicholas et al. (2023) is that external modifying strategies are omitted, due to the difficulty in automatically evaluating the presence or absence of such strategies.

3.1.3. Phase 3: algorithm creation

Algorithms were created to automatically identify pragmatic infelicities for each of the sub-categories in the coding scheme. This process harnessed both rule-based and probabilistic parsing. Rule-based parsing was achieved through the use of powerful matching algorithms, known as regular expressions, to identify the presence or absence of framing or content moves that were typically perceived as diverging from the pragmatic norms of the target community. Where possible, we relied on simple regular expression matching. This was most successful in the opening and closing moves for two reasons. Firstly, the location of the move is known, i.e. at the beginning or end of the text; and secondly, the language choices the Japanese learners used in the corpus to realize these are relatively limited. It should be noted that parsing L2 learner English can be difficult due to orthographic, lexical and grammatical errors; the presence of which added to the challenge of accurately identifying pragmatic infelicities.

Identifying head acts proved too complex for regular expressions alone. Determining the request head act was particularly challenging due to several factors: its unknown location within a text, the variability in language formulations, and, often, the presence of multiple potential candidates. Among these challenges, the foremost was evaluating which of the potential candidates was the actual request head act. To address this, the algorithm needed to evaluate the likelihood of each candidate being the head act. Analysis of both candidate and actual request head acts in the Japanese learner corpus (Nicholas et al., 2023) revealed that the key computational determinants of a head act were sequence, specificity, (referring to specific details regarding the nature of the request, such as asking the receiver to drive to a particular location), and relative directness. For example, when choosing between two candidates, the one that was more indirect, more specific, and occurred later in the text was highly likely to be the request head act. However, automatic identification and comparison of the relative specificity of requests remain a cutting-edge challenge in natural language processing, making this criterion difficult to implement effectively in educational systems, where scalability, reliability, and computational efficiency are key concerns. Head act detection, therefore, was assessed by comparing relative directness and determining sequence; however, using only these two criteria made it less certain that the request head act had been correctly identified. Further corpus analysis was conducted to identify additional criteria that occurred more frequently in head request acts than in other candidate expressions. These criteria were used to fine-tune the head act identification process. For all coding categories, accuracy and reliability was evaluated by comparing automated infelicity identification with the learner corpus manual annotations, with accuracy rates ranging from 85 % to 90 % in both pilot tests.

To further complicate the process of identifying pragmatic infelicities, it is often necessary to identify what should be present but is not. This was the case when attempting to identify the absence of external modifiers. Given the range of potential external modifying

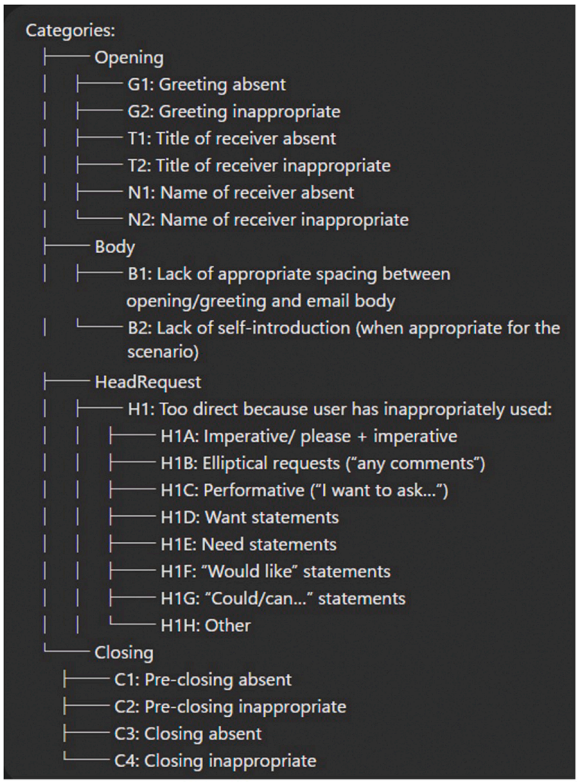


Fig. 1. Coding scheme for C-DA mediation categories.

strategies and linguistic realisations that could be used, it was not possible to determine with a high degree of certainty whether there was an inappropriate lack of such content move strategies.

The coding scheme and algorithms form the basis of the identification layer, which functions as a "representative" email receiver within the relevant target community of practice the learner is situated within, representing the typical pragmatic norms of the community.

3.1.4. Phase 4: feedback creation

Mediation in the C-DA followed previous C-DA studies (Poehner et al., 2015; Qin & van Compernolle, 2021) and adopted a graduated approach. While previous C-DAs have employed three levels (Poehner et al., 2015; Qin & van Compernolle, 2021), we implemented a four-level system of graded mediation (see Fig. 2 for level descriptions with example mediation and Appendix B for full details). In so doing, we aimed to provide a balance between allowing for sensitivity to the ZPD while avoiding learner fatigue. This framework was applied to all codes in the C-DA coding scheme. Specific mediation varied to some extent for each code, depending on the task. For instance, level 4 highly explicit mediation for task 1 (PDR +++) differed for some codes from level 4 mediation in task 4 (PDR - - -), due to differing P, D and R values. The mediation provided for each level was based on mediating moves identified in previous studies (Aljaafreh & Lantolf, 1994; Poehner, 2008; Nicholas, 2020).

As with previous C-DA studies (Poehner et al., 2015; Qin & van Compernolle, 2021), the mediation analytical layer recorded details of the mediation engaged in This allowed for tracking of learner progress within and between C-DA sessions, offering insights into any movement within the learner's ZPD by examining the frequency and explicitness of mediation. When pragmatic infelicities were identified, graded mediation was displayed, with the minimal amount and degree of explicitness employed to enable the learner to proceed with the task. Fig. 3 shows the learner-facing feedback screen with colour-coded mediation, with the colours relating to the pragmatic categories. This enabled the learner to match the mediation to the highlighted section of the text based on the colour.

When the participant submitted an email text, the identification layer of the analytical framework automatically searched for perceived pragmatic infelicities, and, if identified, classified them by subcategory. A message was then sent to the mediation layer, which displayed graded mediation. Initially, at the beginning of each email task in both C-DA1 and C-DA2, level one mediation was engaged in On each submission the level of explicitness was increased for all pragmatic infelicities remaining or occurring. This process continued until the issue was resolved or the maximum number of attempts was reached. The participant completed four email tasks in each round of administration.

3.1.5. Phase 5: system architecture

The C-DA was implemented using Django, a robust Model-View-Template (MVT) architecture. Django synchronized the front-end, back-end, and database servers, and managed interconnected databases that stored tasks, texts, mediation, algorithms, statistics, user data, and more. Two user interfaces were created: one for learners and one for researchers. In this interface, participants could select to view tasks and mediation in Japanese or English. The learner-facing interface was designed to administer the C-DA, while the researcher-facing interface provided access to all interactions, submitted and generated texts, and numerical counts of all variables. This data can be analysed through the interface or exported as CSV files. Functionally, the system comprised an identification layer and a mediation layer (see Author, in press, for a more technical description of the system architecture). Fig. 4 shows how the identification and mediation layers interacted. The identification layer (developed in the View component) served as the core mechanism for pattern detection within our MVT framework. Utilizing regular expressions and advanced algorithms, user-submitted texts were parsed for instances of pragmatic infelicity. The view managed the logic of interpreting user inputs, running them through the identification

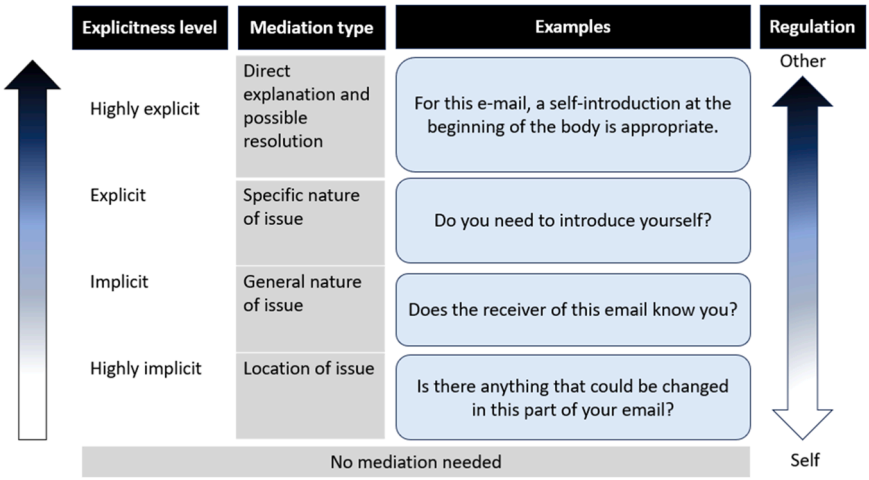


Fig. 2. Four-level mediation framework with descriptions and examples from the Opening move (See *Section 4* and appendices for further example mediation).

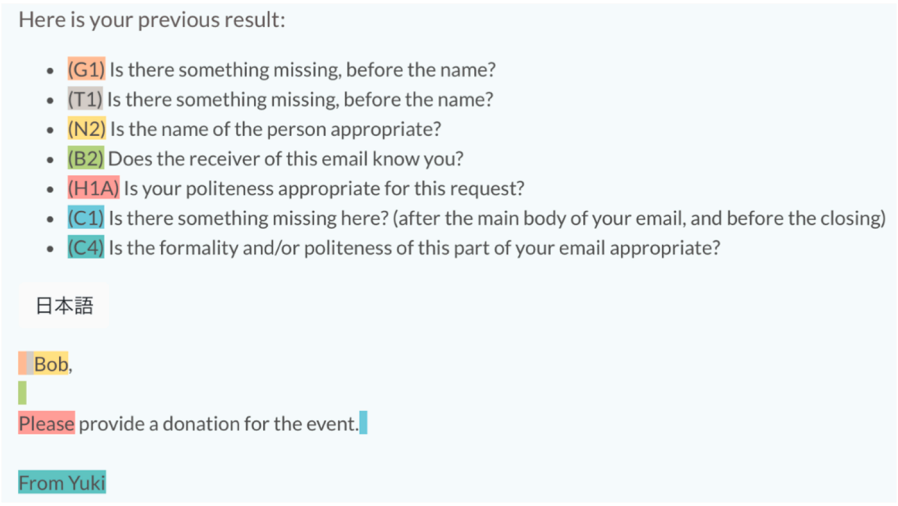


Fig. 3. Screenshot of level 2 mediation.

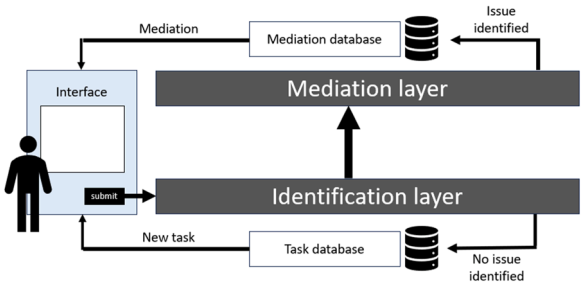


Fig. 4. Visual representation of interaction between identification and mediation layers.

process, and preparing data for the next stage. When an instance of pragmatic infelicity was identified, the mediation layer (developed in the Template component) handled mediation generation. This layer used Django's templating features to dynamically generate user-specific mediation based on the data processed by the views. As users revised their texts, the templates refined the mediation to be more explicit.

3.2. Case study

In this case study of one specific learner, we combined quantitative and qualitative approaches to investigate the research questions. We adopted a case study approach, following previous DA studies (Ableeva, 2010; Poehner, 2008; Nicholas, 2018), as this allowed for a detailed examination of the learner's development across time. While in-person DA case studies typically closely examine transcripts of learner-mediator interactions, we did so with the learner's email texts. In combination with the quantitative analysis, this allowed us to gain insights into the learner's development throughout the C-DA sessions.

3.2.1. Participant

The participant was given the pseudonym "Toro." Informed, voluntary consent was received from the participant, with data fully anonymised. The participant was a male Japanese English L2 learner undergraduate at a Japanese computer science university. Prior to entering university, Toro had received several years of formal school English education, and was enrolled in English language courses at the university, with an estimated L2 language proficiency, based on a mean group TOEIC score, assessed as approximately B1 on the Common European Framework of Reference (CEFR) scale. Toro did not have any overseas travel experience, but had experience interacting with non-Japanese faculty at the institution in which the study took place.

3.2.2. Procedure

"Toro," the participant, engaged in two C-DA sessions (C-DA1 and C-DA2), with a two-week delay between them. Toro read an explanation of the ethical considerations, including anonymity and the option to withdraw, and then indicated his informed consent. Fig. 5 illustrates the procedure.

In each session the participant completed four tasks. For each task, the learner was provided with bilingual instructions and drafted

his email message in a submission field. On submitting the email, automated graded mediation was engaged in, contingent upon need. The learner had up to four opportunities to revise their original email, depending on mediation. Table 2 shows the C-DA administration settings.

The dual-layered analytical framework was designed to provide insights into learner development with regards to the pragmatics aspects of L2 English email writing, leveraging the ZPD concept. By tracking mediation frequency and explicitness across time (within and across sessions), any learner movement within the ZPD towards self-regulation can be made visible. High frequencies of mediation and highly explicit mediation forms may indicate the learner is closer to other-regulation, while the absence of mediation, or low frequency implicit forms can imply a movement towards self-regulation.

The C-DA enabled quantitative analysis of movement within the ZPD by tracking the frequency and level of explicitness of mediation provided for each specific identified code, and for each task. Fig. 6 shows the method of assigning numerical values to the mediation engaged in between the participant and C-DA. A score of 1–4 was assigned for each level of mediation; a score of 5 was assigned if the participant engaged in level 4 mediation, but was still unable to successfully resolve the issue. Additionally, storing of the email text data allowed for qualitative examination of learners' email texts. By combining these two approaches, we were able to gain insights into learner development.

4. Findings

Here, we demonstrate the C-DA performance of a participant using the pseudonym Toro. The C-DA applied the analytical frameworks, identifying perceived instances of pragmatic inappropriateness and implementing a four-level mediation system. By quantifying the frequency and level of explicitness of provided mediation we are able to show visual representations of learner development within the ZPD for both email framing (openings and closings) and content moves (directness strategies within the request head act). Following Nicholas (2020), we use the term "object of mediation" to refer to the particular code identified by the system (e.g. pre-closings), "orientation" to refer to the learner understanding the nature of the object, and "resolution" for resolving the object successfully. Figures represent three broad categories: opening-related objects, head act-related objects, and closing-related objects. Note that B category mediation was excluded from analysis due to its very low frequency. Further, we qualitatively examined the email text data to provide a fine-grained analysis of identified participant challenges, and his development across time. In combination, we have profiled the learner's development with respect to the different pragmatics aspects of L2 email writing.

In the following sections, we show Toro's performance in two email tasks, one in C-DA1, and one in C-DA2. As shown in Section 3.2.2, for each task, Toro was first shown the task scenario in English, with the option of also seeing a translated version in L1 Japanese. Toro then typed the whole email text in the text field, and submitted it. The program automatically identified any perceived instances of inappropriateness and displayed level one mediation for all identified instances at the same time. Toro then revised the whole email text after reading the mediation and submitted draft two. This process was repeated, with mediation increasing in explicitness, until either no instances of inappropriateness were identified or the maximum number of drafts had been reached. For each email draft Toro submitted, we show the whole text, and all identified codes with the mediation provided.

4.1. Toro

In this section, we first show Toro's quantified movement across time for both C-DA1 and C-DA2 sessions. Fig. 7 shows Toro's overall movement within the ZPD for both C-DA1 and C-DA2, combining all scores for all categories. This gives us a holistic visualization of Toro's engagement in mediation in both sessions, and shows mediation frequency and explicitness to be lower in C-DA2 for all four tasks. Further, we see an overall trajectory in both sessions towards self-regulation.

Figs. 8-10 break this down into framing moves (openings and closings respectively) and head act-related mediation, showing Toro's task performances across time, within and between sessions. Regarding opening and closing related objects, Figs. 8 and 9 show Toro's responsiveness to mediation across time. Opening-related categories relating to the greeting, receiver title and name are grouped together, showing development for opening-related objects generally. Likewise, closing-related sub-categories are also grouped together in the figures.

Fig. 8, focusing on opening-related mediation, shows an overall downwards trajectory towards self-regulation in both C-DA1 and C-DA2. We also see less need for mediation in C-DA2 task one and task two tasks in comparison with their C-DA1 counterparts, indicating

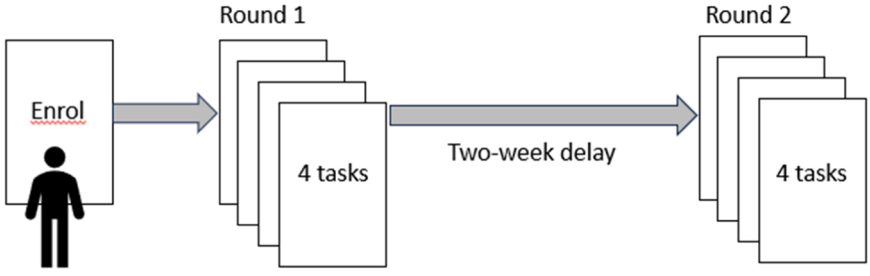


Fig. 5. CD-A Administration procedure.

Table 2
C-DA administration settings.

Feature	Setting
Number of sessions	2
Number of tasks per session	4
Variety of tasks	Different combinations of P, D and R
Order of tasks	Fixed
Levels of mediation	4
Text length	Open

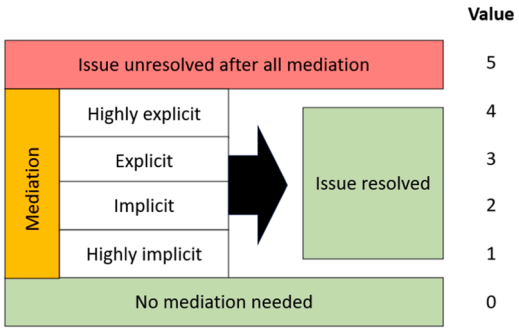


Fig. 6. Assigning of numerical scores to mediation.

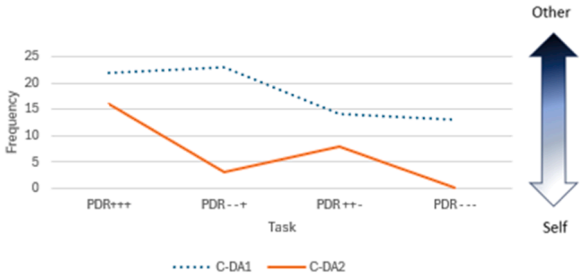


Fig. 7. Overall mediation for all categories for C-DA1 and C-DA2 tasks across time.

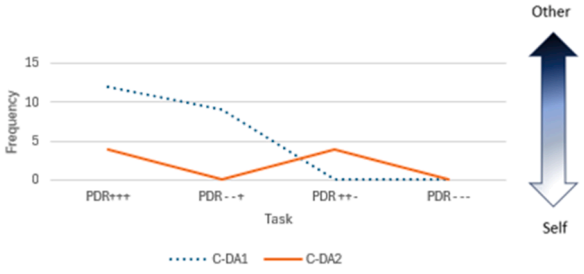


Fig. 8. Opening-related mediation for tasks in C-DA1 and C-DA2
Note: Frequency counts combine scores for the three opening-related sub-categories of greeting, title and name, with a maximum possible count of 15 for each task.

development. However, C-DA2 also shows a non-linear trajectory to some extent, with Toro engaging in more mediation in C-DA2 task three, than in session 1. No mediation is engaged in at all for the task four in either session.

Fig. 9 shows a striking difference between C-DA1 and C-DA2. The C-DA coding scheme includes four closing-related codes – relating to pre-closings (absent or inappropriate) and closings (absent or inappropriate). In all four C-DA1 tasks, Toro engages in mediation regarding closings and/or pre-closings, and is frequently unable to resolve the issues even after receiving highly explicit mediation. However, in C-DA2, mediation is produced in only task one, with the object being successfully resolved. This suggests learner development regarding closing framing moves, moving towards self-regulation.

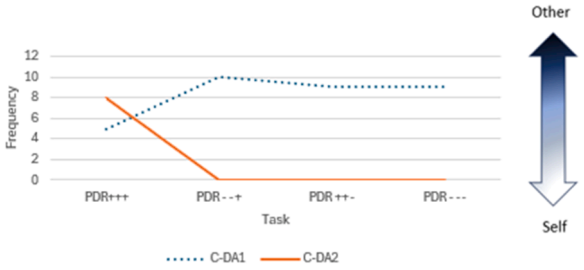


Fig. 9. Closing-related mediation for tasks in C-DA1 and C-DA2
Note: Frequency counts combine scores for the two closing-related sub-categories of pre-closing and closing, with a maximum possible count of 10 for each task.

Focusing on directness strategies within the request head act shows that Toro finds this aspect of email writing challenging, with high frequencies of mediation in both C-DA 1 and C-DA2. This indicates that the participant is still reliant upon other-regulation. However, we do see evidence of a certain degree of movement within the ZPD, as shown in Fig. 10. We see little movement towards self-regulation in C-DA1, with explicit mediation engaged in for all tasks. In C-DA2, we see somewhat less mediation for the first three tasks, and none required for the final task four.

4.1.2. Email task mediation and responsiveness

Here, we examine in detail Toro's email texts, mediation received, and revised drafts for a task in each C-DA session, to demonstrate how the learner experienced the system and responded to mediation. One point to note is that the participant was asked to use the gender-neutral name "Yuki Suzuki" for all tasks, to preserve anonymity.

Toro first read the above task scenario (also available in L1 Japanese), wrote the first whole email text draft, and submitted it. The system automatically searched for identified instances of inappropriateness. Below is Toro's first draft with identified codes. The system displayed the mediation above the first draft text (mediation is also available in L1 Japanese); for each code, the relevant portion of email text was highlighted.

From the beginning of C-DA1 overall, the system identified relatively few instances of opening-related objects in Toro's email texts. In all, the system identified opening-related issues in four of the eight tasks. The first two tasks in C-DA1 both contained identified issues with openings, while the latter two tasks did not. In C-DA1 task two specifically, the P- and D- values assigned to this scenario suggest a level of informality; because of this, an inappropriate greeting (G2), use of a title (T2) and name (N2) were identified in the opening.

Toro's first attempt here omitted a conventional, recognized pre-closing or any closing, leading to level 1 mediation (C1 and C3 codes respectively). The system identified *"…I would like to borrow your help"* as the head act, and presented an H1F code due to perceived inappropriate directness. This illustrates the challenge of automatic head act detection, as in this particular text, it may be argued that a better candidate for the head act is "*I want you to take me Sendai*" due to its greater specificity, which would entail an H1D code for a "want statement." However, it did not impact the performance of the learner here, as both H1F and H1D codes have the same mediation messages; further, the system, in this instance, highlighted the text body as a whole here, rather than a specific sentence. After receiving the level 1 mediation, Toro revised the email and submitted draft 2.

Draft 2 shows the system identifying the same codes again, and so showing level 2 mediation (implicit). We see here Toro making a small number of minor changes to the email text, separating the first sentence into two, adding a period after "…*next week.*" We also see the addition of a comma in the second sentence, but no changes to pragmatic features. This indicates that Toro had not yet oriented to the object of the highly implicit mediation, focusing on punctuation, rather than directness, formality or conventions.

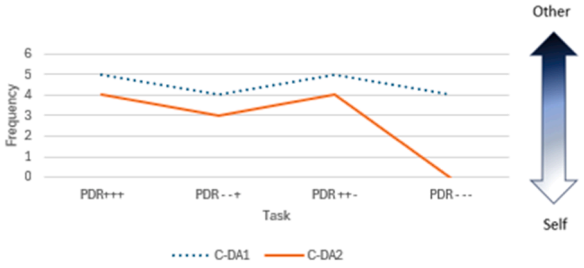


Fig. 10. Head act-related mediation in C-DA1 and C-DA2 tasks.

C-DA1, Task 2 (PDR - -)

Task scenario: You need to travel for an academic conference next week, but the train there is expensive. You email your friend (who has a car) asking them to drive you there. It takes about three hours to drive there from your home. Your friend will be busy next week, so this will be inconvenient for them.

Draft 1 (level 1 mediation)

G2: Is there anything that could be changed in this part of your email?

T2: Is there anything that could be changed in this part of your email?

N2: Is there anything that could be changed in this part of your email?

H1F: Is there anything that could be changed in this part of your email?

C1: Is there anything that could be changed in this part of your email?

C3: Is there anything that could be changed in this part of your email?

Dear Ms. Tanaka

I need to go to Sendai for an academic conference next week, but the train's fee is too expensive, so I would like to borrow your help.

I want you to take me Sendai. It spends three hours taking me Sendai in car.

I'm so sorry for this inconvenient for you.

Draft 2 (level 2 mediation)

G2: Is the greeting salutation appropriate?

T2: Is the title of the person appropriate?

N2: Is the name of the person appropriate?

H1F: Is your politeness appropriate for this request?

C1: Is there something missing here (after the main body of your email, and before the closing)?

C3: Is there something missing?

Dear Ms. Tanaka

I need to go to Sendai for an academic conference next week. But, the train fee is too expensive, so I would like to borrow your help.

I want you to take me Sendai. It spends three hours taking me Sendai in car.

I'm so sorry for this inconvenient for you.

In draft 3, Toro revised the closing, adding a complementary closing, but not a name. While this led the system to identify an inappropriate closing (C4), it does show that Toro had oriented to the identified closing infelicity. This was not the case, however, for the opening and head act, prompting the system to display level 3 mediation (explicit).

In draft 4, Toro made a number of changes. The learner oriented to the opening object of mediation, employing a more informal greeting, and the friend's first name, rather than surname. Because of the scenario's PDR values, this was perceived as appropriate, and no opening-related codes were identified. In the third and fourth tasks of C-DA1, no opening-related instances were identified, indicating that the learner may have been responding to the mediation provided in both this task and task one.

For the closing, a name was still absent, with a formal complementary closing, leading to level 4 mediation for the C4 code. Toro also oriented to the head act object as well, revising the text, but still using a conventionally direct realization, leading to level 4

Draft 3 (level 3 mediation)

G2: The greeting salutation is too casual/formal.

T2: The title is too casual/formal.

N2: The name you used is too casual/formal.

H1F: Can you change this request to be more polite?

C1: Is there a sentence you could add here that people often write in emails?

C4: Can you change this part of your email to be more formal, or casual, or more polite?

Dear Ms. Tanaka

I need to go to Sendai for an academic conference next week. But, the train fee is too expensive, so I would like to borrow your help.

I want you to take me Sendai. It spends three hours taking me Sendai in car.

I'm so sorry for this inconvenient for you.

Sincerely from

Draft 4 (level 4 mediation)

H1D: To make your request more polite, you can change the grammar. An example of a more polite request might be "I was wondering if you could possibly…"

C1: We recommend including a sentence before the closing of your email, such as "I know this is a big favour to ask, so don't worry if you can't do it."

C4: We recommend the following closing as being appropriate for your email: "Best, name" or "Thanks, name" or "Speak soon, name."

Hi, Aya.

I'm Yuki.

I need to go to Sendai for an academic conference next week. But, the train fee is too expensive, so I want to borrow your help.

I want you to take me Sendai. It spends three hours taking me Sendai in car.

I'm so sorry for this inconvenient for you.

Sincerely

Draft 5

Hi, Aya.

I'm Yuki.

I need to go to Sendai for an academic conference next week. But, the train fee is too expensive, so I want to borrow your help.

I was wmdering if you could possibly take me Sendai. It spends three hours taking me Sendai in car.

I'm so sorry for this inconvenient for you.

I know this is a big favour to ask, so please don't worry if you can't.

Sincerely

mediation for the H1D code (inappropriate want statement).

Draft 5 was Toro's response to the highly explicit level 4 mediation; because this was the final draft, no further mediation was given, and the learner proceeded to the next task in the C-DA session. Draft 5 shows Toro resolving the head act infelicity by adopting the recommended request realization in the level 4 mediation "*I was wmdering…*). Toro also added a pre-closing prior to the closing framing move, also following the example realization shown in the C1 code mediation. However, the C4 code remained unresolved, with a name still absent from the closing. Toro's perceived infelicities regarding pre-closing and closing framing moves continued in the other C-DA1 tasks as well, with frequent highly explicit mediation levels initiated. As exemplified in this C-DA1 task, Toro appeared not to orient to the object of mediation regarding the closing, uncertain as to which portion of the closing to attend to. In contrast, we see below in C-DA2 task 1 that Toro was able to orient to the object of the closing (C4) after implicit mediation, even if he was unable to successfully resolve it until more explicit mediation was engaged in.

In draft 1, we see level 1 one mediation for three framing move-related codes. In terms of the opening, Toro omitted a greeting, leading to the C-DA displaying a G1 code. A C1 code was also identified due to the lack of a recognized conventional pre-closing, and a C4 code (inappropriate closing), due to the absence of a complementary closing.

In terms of the head act, in C-DA2, we see a reduction in frequency of mediation and explicitness. However, in the first three tasks, we still see Toro engaging in explicit mediation in order to resolve identified objects. In C-DA2 task one here, Toro emailed an unfamiliar professor, with + values assigned for P, D and R. Toro employed a conventionally indirect head act ("…*could you help…*"), which the C-DA identifies as being insufficiently indirect, applying an H1 G code for a "*could you…*" strategy.

In response to level 1 mediation, in draft 2 Toro did not appear to orient to the opening-related mediation, leaving the opening unchanged. Toro did add a sentence following the head act, which may have been an attempt to employ a pre-closing. However, the system did not recognize it as such, due to its non-conventional nature for this type of scenario. As with the opening, the closing was also unchanged, leading to both C1 and C4 level 2 mediation being presented. With regards to the head act, Toro deleted the preceding checking of availability (*"If you have time…*"), indicating that the learner may not have oriented to the object of the mediation (insufficient indirectness)

Here, Toro made minor revisions to the opening, but did not orient to the specific object (the lack of a greeting), prompting level 3 mediation. The continuing lack of a recognized pre-closing also led to level 3 mediation. Toro did orient to the closing object, adding a complementary closing ("*Best,"*), but its informality did not resolve the object, leading to C4 level 3 mediation as well. Toro had oriented to the head act directness; an external modification strategy is re-inserted prior to the head act, checking availability. However, the head act itself was revised to a more direct formulation, prompting an H1A code (imperative) with explicit mediation displayed.

In draft 4, Toro oriented to the opening greeting object after receiving level 3 explicit mediation ("*Dear…"*), resolving the G1 code. Following this, we only see opening-related mediation once more in C-DA2, in task three, which was resolved after level 2 implicit mediation, alerting the learner to the general nature of the issue. The absence of a pre-closing prompted a further C1 code with attendant level 4 mediation. Similarly, while Toro did revise the complementary closing, the system did not recognize it as being appropriate for this scenario, and displayed a level 4 C4 code. Toro further revised the head act in this draft as well, replacing the previous use of the imperative with a conventionally indirect strategy. This was identified as belonging to the same H1 G code as identified in the first two drafts, being perceived as being insufficiently indirect when considering the task's PDR values. The displaying of the highly explicit mediation led to Toro's final email draft, shown below.

In this final draft, Toro further revised the opening to use an appropriate title. It should be noted that Toro also used this title in drafts 1 and 2, but seemed to experiment with a different title in draft 4, perhaps because he was uncertain as to the precise object of the opening-related mediation. However, he reverted to the previously used "Prof." title here, perhaps after realizing the target of the mediation was the greeting. Similarly, we see Toro revert back to language used in early drafts, after making considerable revisions in draft 4. Again, this may be after orienting to the precise nature of the mediation. Also in draft 5, Toro added a pre-closing, following the suggested conventional example provided in the level 4 mediation. Likewise, Toro revised the closing complementary phrase, following the mediation's suggestion.

By examining closely the above two email tasks, therefore, we can see how the learner experienced the C-DA, and how Toro responded to mediation differing in explicitness for different tasks, and across time. We can also see the differences in how Toro responded to different pragmatic aspects of email composition; with framing moves varying from those relating to the request head act.

5. Discussion

In this study, a C-DA was employed, incorporating a two-layered framework targeting the pragmatics aspect of L2 email writing. In this way, we sought to address a number of primary methodological issues with L2 email pragmatics studies. To date, studies have separated pre- and post-test phases from the pedagogic intervention (Chen, 2015; Nguyen et al., 2015; Uso-Juan, 2022). This informs

C-DA2, Task 1 (PDR)

Task scenario: You are working on a research project. Professor Johnson, who works at a different university, is an expert in the field. You do not know Professor Johnson. Email Professor Johnson to ask for help with analyzing data and giving advice.

Draft 1

G1: Is there anything that could be changed in this part of your email?

H1G: Is there anything that could be changed in this part of your email?

C1: Is there anything that could be changed in this part of your email?

C4: Is there anything that could be changed in this part of your email?

Professor Johnson

Hello, this is Yuki Suzuki. I'm working on a research project as part of my university studies. I know you are an expert in the field. If you have time, could you help with analyzing my data and giving advice?

Draft 2 (level 2 mediation)

G1: Is there something missing, before the name?

H1G: Is your politeness appropriate for this request?

C1: Is there something missing here (after the main body of your email, and before the closing)?

C4: Is the formality and/or politeness of this part of your email appropriate?

Professor Johnson

Hello, this is Yuki Suzuki. I'm working on a research project as part of my university studies. I know you are an expert in the field. Could you help with analyzing my data and giving advice? If you have time, please send me an email.

Yuki Suzuki

Draft 3 (level 3 mediation)

G1: There is no greeting salutation in opening of your email.

H1A: Can you change this request to be more polite?

C1: Is there a sentence you could add here that people often write in emails?

C4: Can you change this part of your email to be more formal, or casual, or more polite?

Prof. Johnson,

From Yuki Suzuki

Hello, this is Yuki Suzuki. I'm working on a research project as part of my university studies. I know you are an expert in the field. If you have time, please help me with analyzing my data and giving advice? If you have time, please send me an email.

Best, Yuki Suzuki

Draft 4 (level 4 mediation)

H1G: To make your request more polite, you can change the grammar. An example of a more polite request might be "I was wondering if you could possibly…"

C1: We recommend including a sentence before the closing of your email, such as "Thankyou for your time and I look forward to hearing from you."

C4: We recommend the following closing as being appropriate for your email: "Sincerely, name" or "Kind regards, name."

Dear Mr. Johnson.

My name is Yuki Suzuki. I am other university student. Now, I am doing a research project. You specialize my research thema.

So, would you give me the advise for my research?

Best regard Mr Johnson.

Yuki Suzuki

Draft 5

Dear Prof. Johnson,

Hello, I'm Yuki Suzuki, working on a research project as part of my university studies.

I know you are an expert in the field. If you have time, I was wondering if you could possibly help me with analyzing my data and giving advice? If you have time, send me an email.

Thankyou for your time, and I look forward to hearing from you.

Sincerely, Yuki Suzuki

us of a learner's independent performance, but limits insights into how they perform in collaboration with a skilled other, or program, and, thus, into abilities still in the process of maturing (Poehner, 2008; Nicholas, 2020; Qin & van Compernolle, 2021). Further, separation means that findings from the assessment phases do not typically inform the intervention (Chen, 2015; Uso-Juan, 2022). The primary approach to assessment to date has also been the use of holistic scales. While this has sometimes been combined with the coding of qualitative data for pragmatic features (Chen, 2015; Nguyen, 2018; Uso-Juan, 2022), we suggest this provides limited specificity into precise text elements the raters found to be inappropriate. Further, feedback in previous studies is typically not grounded in a theoretical perspective on development.

In the current study, we applied a C-DA methodology which aimed to address these issues by being situated within SCT, which places emphasis on the social nature of learner development. The C-DA brought together learning and assessment through the administration of collaborative tasks in which the learner and interlocutor (here, the C-DA program) engaged in mediation when a perceived pragmatic infelicity had been identified. The advantage of this unification is two-fold. The diagnostic function of DA methodology (Poehner, 2008), identifying specific aspects of a learner's texts, provides a fine-grained analysis of pragmatic inappropriateness that holistic judgements may not. Further, by examining the level of explicitness and frequency of mediation, insights are gained into a learner's development within their ZPD across time (Poehner, 2008; Qin & van Compernolle, 2021). Relatedly, by leveraging the concept of the ZPD, the mediation aims to optimally and reliably promote development in the learner. This is in contrast to previous studies' primary focus on explicit feedback forms (Chen, 2015; Nguyen et al., 2015; Uso-Juan, 2022).

The current study employed collaborative tasks with a framework designed to identify specific perceived pragmatic infelicities in aspects of the learner's texts. This was combined with systematic mediation for each identified object, gaining insights into learner responsiveness. Evaluating mediation frequency and explicitness allows for insights into both specific learner challenges, and also makes visible evidence of development within the ZPD. We focused on one specific learner, Toro, to evaluate the C-DA's effectiveness in enabling a detailed learner profile of particular pragmatics-focused challenges, and evidence of development.

We developed a profile of Toro's development that shows variation between framing and content moves within email texts. Regarding opening-related pragmatics objects, Toro engaged in less frequent and less explicit mediation than with other aspects of email writing. The trend was towards less mediation in C-DA2; however, even in C-DA1, Toro was able to successfully resolve objects with relatively little mediation. This indicates that the learner may be relatively close to self-regulation with regards to openings, and aligns with previous findings indicating that learners sometimes find openings less challenging than closings (Nguyen, 2018).

With closings, we see a contrast between C-DA1 and 2. A number of perceived infelicities were identified in Toro's closings in C-DA1, engaging in explicit mediation for all four tasks; further, despite such mediation, Toro was frequently unable to resolve the

objects of mediation. In C-DA1, the system identified pre-closing objects in three tasks, and closing-related ones in all four. Conversely, Toro engaged in closing-related mediation in only the first C-DA2 task; following that, the C-DA did not identify any objects in the final three tasks. This suggests considerable learner movement from other to self-regulation.

Examining content moves within the request head act, we also saw a degree of change. While in C-DA1, Toro engaged in highly explicit mediation in every task, and was sometimes unable to resolve the object, in C-DA2, less frequent and less explicit mediation was engaged in overall. Highly explicit mediation was still required in two tasks; however, Toro was able to resolve them. In the final task, no mediation was provided at all.

The C-DA methodology applied here to Toro's L2 English email texts, offers a level of granularity in terms of insights into the learner's performance in collaboration with the program, and Toro's emerging understanding and control over the pragmatics aspect of email texts. For instance, the specificity of the coding scheme allows for identification of issues relating to three different aspects of openings (greetings, titles and names), providing a high degree of granularity in comparison with more holistic judgements (Chen, 2015; Economidou-Kogetsidis, 2011, 2016). This aligns with Nicholas' (2020), study of oral requesting-in-interaction, which also provided insights into individual learners' perceived infelicities with regards to different aspects of the target requesting act.

Further, the C-DA engaged in both graded mediation and tracked mediation level and frequency, allowing for insight into Toro's responsiveness to mediation and developmental trajectory in orienting himself to target community pragmatic norms and expectations. We saw marked differences between Toro's responsiveness to framing move-related mediation for openings and closings, and that related to the request head act. This supports the findings of both previous DA studies (Ableeva, 2010; Nicholas, 2020) and C-DA studies (Poehner et al., 2015; Qin & van Compernolle, 2021) that found this methodology to be effective in uncovering development in learners, and also how a learner's development can vary with regards to differing target pragmatic aspects. We generally saw a movement in Toro's performances from other-regulation towards self-regulation, as the C-DA1 and C-DA2 sessions progressed. This suggests that the C-DA may have been effective in not only assessing the learner's development, but also promoting that development at the same time (Poehner, 2008), by providing developmentally-sensitive mediation. Described as a development-oriented methodology (Poehner, 2008), these twin aims of assessment and learning are key in this approach. We argue, therefore, for the overall success of the methodology's diagnostic functionality and capacity; further, in unifying assessment and learning, enabling a specific and detailed developmental profile of the learner.

One point to note is with regards to the possible influence of the task prompt language on the participant's email language choices. In designing the task prompts, the guidelines suggested in Roever (2022) were followed, with the participant role and goal of the communication clearly stated, and enough information provided for the learner to understand the context, without overburdening them. Further, the participant roles were non-gender specific and context-internal (e.g. a student-professor interaction should be study-related; Hudson, 2001). It was also necessary to include language that made clear that the learner was expected to produce a request in his email (e.g. "ask," "need to…" "must…") in order to reduce the likelihood of non-request acts being elicited (Hudson, 2001). As much as possible, the prompts used standardized language; however, in two tasks, there were variations, with slightly different language used in C-DA1 and C-DA2 prompts. In task 4, the C-DA1 prompt included a "*you want to…*" phrase, while the C-DA2 prompt did not. In C-DA1, for this task, Toro's first draft employed a want statement in the head act ("*I want you to practice…*"). In C-DA2, however, Toro employed a conventionally indirect strategy. It is possible, then, that Toro was influenced in C-DA1 task 4 by the prompt language. However, we suggest that, even if this is the case, Toro's engagement with the task here provides insight into his development. When Toro received mediation regarding the head act in C-DA1, he did not revise the head act until receiving highly explicit level 4 mediation, indicating he may not have oriented to the infelicity and/or lacked pragmalinguistic knowledge of alternative formulations. In draft 5, he did revise it, producing a conventionally indirect strategy, ("*can you…*"), resolving the object. In C-DA2 task 4, Toro immediately used a similar indirect strategy ("*could you help…*") in draft 1, indicating a possible connection between the C-DA1 mediation received, and Toro's C-DA2 task 4 language choice. Additionally, there was also variation in prompt language in C-DA1 and C-DA2 task three, with a want statement in the C-DA2 prompt. However, here, Toro did not mirror the prompt language in the head act. We acknowledge, therefore, the challenge in designing request prompts that, on the one hand, make it clear that a request is expected from the learner, while at the same time seeking to minimize the possible influence of the language on the learner. However, we argue that such influence, if present, does not negate the insights gained from the mediation approach.

6. Conclusion

A number of important limitations should be noted. While the C-DA enables a fine-grained approach to the identification of pragmatic infelicities, it does not provide an overall, holistic judgement of a whole text that previous studies do (Chen, 2015; Economidou-Kogetsidis, 2011, 2016). While there are advantages to a high degree of specificity, including the ability to inform further instruction or feedback, a holistic judgement also offers useful insights into how an L2 email text as a whole may be perceived, which may align with how such emails may be received in authentic email interactions.

Further, the C-DA implements a probabilistic rules-based approach to identifying instances of pragmatic inappropriateness in the email texts (see Section 3.1.3), and non-typical L2 learner language use introduces a degree of unpredictability that cannot always be accounted for in the system. Additionally, the C-DA employs an interventionist standardised approach to mediation. In combination, the occurrence of non-typical language use and the standardized approach does, at times, lead to a degree of inflexibility that would not be the case in an in-person interactionist DA context. For example, in C-DA2 task one, draft four, the C-DA identified an object due to Toro's non-typical inclusion of the receiver's name after the complementary closing. The complementary closing itself, however, may be pragmatically appropriate for the context. A human mediator in this situation might have responded in a more nuanced manner than the C-DA was capable of.

An additional limitation of the C-DA system is with regards to modifying strategies external to the head act. Such external modifiers are typically an important component of a request (whether that be in interactive talk contexts or in an email), and serve to mitigate the directness of the request act. In talk-in-interaction, it is even possible for an external modifier to lead to the hearer anticipating the upcoming request and making an offer, thus allowing the speaker to avoid producing a direct or conventionally indirect head act strategy (Brown & Levinson, 1987). While we would argue that this is less likely in an email context, and in the current study, in which the task instructions prompt the participant to produce a request, external modifiers are nonetheless common and important in request emails. As discussed in Section 3.1.3, however, the C-DA does not identify perceived infelicities related to external modifying strategies. Identifying the absence of a wide range of possible external modifiers and the ways in which they may be realized – especially in L2 learner texts – was beyond the technical limitations of the system. From a computer programming perspective, we suspect this will continue to be a challenge to reliably solve. One possible way to address this might relate to the nature of the email task itself. This study elicits open, whole texts from the participant, thus allowing the learner considerable flexibility in composing each email. A more constrained email task type, in which, for example, the learner is explicitly instructed to produce certain pragmatic features, in combination with separate fields for writing different parts of an email text, would potentially allow the programme to identify external modifying strategies more easily, narrowing both the portion of text to search within, and the range of strategies to search for.

In terms of the mediation, inevitably the time and space constraints of the C-DA system mean that the mediation provided is limited in terms of detail. Regarding the highly explicit level 4 mediation in particular, while typically there are a range of possible pragmatically appropriate forms that could be employed by the learner in a given text, it was not practical to provide lengthy explanations of multiple possible realisations. The mediation, therefore, provides one or two possible options for learners to employ if they wish to do so. In this sense, combining the C-DA programme with a more in-depth period of instruction would be beneficial.

Relatedly, the C-DA does not have the capacity to prompt and capture *verbalization* (Nicholas, 2020; Poehner, 2008), in which a learner is prompted by a mediator to explain the reasoning for their pragmatic choices, demonstrating the extent of their conceptual understanding of relevant concepts, such as power or social distance. In this regard, in-person interactionist DA allows for a depth of interaction and collaboration that is not possible with the interventionist C-DA approach. Further, interactionist DA is also concerned with not only the mediation moves from the mediator (or program), but also the ways in which the learner interacts with the mediator (known as *reciprocity*; Poehner, 2008). This bi-directionality is limited in the C-DA to analysis of the learner's texts.

These limitations, however, may be compensated for by the efficiency of the automated approach to task collaboration and mediation, potentially widening access to DA methodology. Further, while the C-DA lacks the flexibility of in-person DA, our analysis shows it is able to develop a detailed learner profile, identify specific instances of perceived pragmatic inappropriateness, and both assess and promote development.

Further research may work towards incorporating additional functionality, narrowing the gaps in capability between in-person DA and computerized forms. This would include capturing learner reasoning underlying their pragmatics choices and evaluating their developing understanding of target concepts. This study is also specific to the target community within which the study participants are situated. The C-DA diagnostic framework and mediation is grounded in a specialized corpus of perceived inappropriateness directly relevant to the learner profiled here. The goal, therefore, was to raise the learner's awareness of these norms and promote his ability in future to make conscious pragmatic decisions aligned with his intentions. Care should be taken, therefore, in generalizing these findings beyond the context in which they were elicited.

Additionally, future research may focus on further improving the accuracy and reliability of the system's automated identification of perceived pragmatic infelicities. Achieving high levels of accuracy for framing moves is less challenging than for content-related strategies. This is due to the relatively formulaic nature of the former, and their recognized specific, typical locations in email texts. For content moves, however, the challenge of both accurately identifying the head act in a text, and infelicities within it, is considerable (as demonstrated in C-DA1 task 2, shown in Section 4.1.2), due to the wide range of possible formulations and potential non-typical L2 learner language.

This study shows the C-DA was able to implement a dual-layered analytical framework that automatically identified specific instances of perceived pragmatic inappropriateness and initiated mediation, allowing for both promotion of development and assessment within the ZPD. In so doing, a detailed learner profile was built that provides a granular perspective on the learner's pragmatics-related challenges and developmental trajectories.

CRediT authorship contribution statement

Allan Nicholas: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation. **John Blake:** Writing – original draft, Project administration, Methodology, Investigation.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Allan Nicholas reports financial support was provided by Japan Society for the Promotion of Science. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

This work was supported by a JSPS KAKENHI (Grants-in-aid for Scientific Research), Grant number 19K00826.

Appendix A. Task scenarios

Colour	Task scenario
PDR + + +	**C-DA1** You are organizing a university event; local businesses' products are showcased to the public. To help fund it, email Mr. Smith, a local business owner, to ask for a financial donation. You do not know Mr. Smith. **C-DA2** You are working on a research project. Professor Johnson, who works at a different university, is an expert in the field. You do not know Professor Johnson. Email Professor Johnson to ask for help with analyzing data and giving advice.
PDR - - +	**C-DA1** You need to travel for an academic conference next week, but the train there is expensive. You email your friend (who has a car) asking them to drive you there. It takes about three hours to drive there from your home. Your friend will be busy next week, so this will be inconvenient for them. **C-DA2** You must buy an expensive textbook, but you do not have enough money. Email your good friend (he/she lives in a different city to you) asking them to lend you the money.
PDR + + -	**C-DA1** You must submit a document to the local government office proving that you are a student. Email the university administrative manager asking them to provide you with the document. **C-DA2** You are organizing an event in which local businesses' products are showcased. You want to use a photograph (you already have the photograph) of one local businesses' product in the event flyer. Email Mr. Blair- the business owner- to ask for permission.
PDR - - -	**C-DA1** You have a close friend who is an international student. You want to practice your English conversation skill next week, so you email them asking if they can spend five minutes of their time talking with you in English. **C-DA2** You are taking a class in math, but you missed a recent lesson. Your classmate (a friend) has notes from the class. Email your classmate asking them to lend you their notes.

Appendix B. Mediation for pragmatic infelicity codes, for mediation levels one-four

	Level 1 hint	**Level 2 hint**	**Level 3 hint**	**Level 4 hint**
G1 Greeting absent	Is there anything that could be changed in this part of your email?	Is there something missing, before the name?	There is no greeting salutation in the opening of your email.	For this email, the greeting salutation _____ would be appropriate: PDR+++ task: "Dear" PDR - - +: "Hi" PDR ++ - task: "Dear" PDR - - - task: "Hi"
G2 Greeting inappropriate		Is the greeting salutation appropriate?	The greeting salutation is too casual/formal.	For this email, the greeting salutation _____ would be appropriate: PDR+++ task: "Dear" PDR - - +: "Hi" PDR ++ - task: "Dear" PDR - - - task: "Hi"
T1 Title of receiver absent		Is there something missing, before the name?	There is no title before the name of the person.	For this email, the title ___ would be appropriate. PDR+++ task: "Mr/Prof." PDR - - +: no title needed PDR ++ - task: "Mr/Prof" PDR - - - task: no title needed
T2 Title of receiver inappropriate		Is the title of the person appropriate?	The title is too formal/ casual.	For this email, the title ___ would be appropriate. PDR+++ task: "Mr/Prof." PDR - - +: no title needed PDR ++ - task: "Mr/Prof" PDR - - - task: no title needed
N1 Name of receiver absent		Is there something missing?	There is no name.	For this email, writing the name ___ is appropriate. PDR+++ task: Surname of receiver PDR - - +: first name of receiver PDR ++ - task: Surname of receiver PDR - - - task: first name
N2 Name of receiver inappropriate		Is the name of the person appropriate?	The name you used is too formal/casual.	For this email, writing the name ___ is appropriate. PDR+++ task: Surname of receiver PDR - - +: first name of receiver

(*continued on next page*)

(*continued*)

	Level 1 hint	Level 2 hint	Level 3 hint	Level 4 hint
				PDR ++ - task: Surname of receiver PDR - - - task: first name
B1 Spacing		Is the formatting in this part of the email appropriate?	Is the spacing of this part of the email appropriate?	Separate the opening part of the email from the body by pressing the "Return" key. There should be a blank line between the opening and body.
B2 Lack of self-introduction		Does the receiver of this email know you?	Do you need to introduce yourself?	For this e-mail, a self-introduction at the beginning of the body is appropriate.

~~Note: We show here the L2 English mediation, but for all mediation, L1 Japanese translations are available for the participant in the C-DA.~~

	Level 1 hint	Level 2 hint	Level 3 hint	Level 4 hint
H1A Too direct-imperative **H1C- too direct-performative** **H1D- too direct- want statements** **H1E- too direct- need statements** **H1F- too direct-"would like" statements** **H1G- too direct-"could/can…"** **H1H- too direct- other**	Is there anything that could be changed in this part of your email?	Is your politeness appropriate for this request?	Can you change this request to be more polite? ?	To make your request more polite, you can change the grammar. An example of a more polite request might be: PDR+++ task: "I was wondering if you could possibly…" PDR - - +: "I was wondering if you could possibly…" PDR ++ - task: "Could you please…" PDR - - - task: "Can/could you…"

~~Note: H1B category is omitted as there were no instances identified.~~

	Level 1 hint	Level 2 hint	Level 3 hint	Level 4 hint
C1- Pre-closing absent	Is there anything that could be changed in this part of your email?	Is there something missing here? (after the main body of your email, and before the closing)	Is there a sentence you could add here that people often write in emails?	We recommend including a sentence before the closing of your email, such as: PDR+++ task: "Thank you for your time, and I look forward to hearing from you." PDR - - + task: "I know this is a big favour to ask, so please don't worry if you can't do it." PDR ++ - task: "Thank you for your help." PDR - - - task: "Thank you!"
C2- Pre-closing inappropriate		Is the formality and/or politeness of this part of your email appropriate?	Can you change this part of your email to be more formal/ casual/ polite?	
C3- Closing absent		Is there something missing?	Can you add a closing to your email? How do people usually end an email?	We recommend the following closing as being appropriate for your email: PDR+++ task: "Sincerely, name" or "Kind regards, name;" PDR - - + task: "Best, name" or "Thanks, name" or "Speak soon, name;" PDR ++ - task: "Sincerely, name" or "Kind regards, name;" PDR - - - task: "Best, name" or Thanks, name" or "speak soon, name."
C4- Closing inappropriate		Is the formality and/or politeness of this part of your email appropriate?	Can you change this part of your email to be more formal/ casual/ polite?	

References

Ableeva, R. (2010). *Dynamic assessment of listening comprehension in second language learning*. Pennsylvania State University.

Aljaafreh, A., & Lantolf, J. P. (1994). Negative Feedback as regulation and second language learning in the zone of proximal development. *The Modern Language Journal, 78*, 465–483. https://doi.org/10.2307/328585

Blum-Kulka, S., & Olshtain, E. (1984). Requests and apologies: A Cross-Cultural Study of Speech Act Realization Patterns (CCSARP) 1. *Applied Linguistics, 5*(3), 196–213. https://doi.org/10.1093/applin/5.3.196

Bou-Franch, P. (2006). Solidarity and deference in Spanish computer-mediated communication: A discourse-pragmatic analysis of students' emails to lecturers. In P. Bou-Franch (Ed.), Ways into discourse (pp. 61–79). Comares.

Brown, P., & Levinson, S. C. (1987). *Politeness: Some universals in language use*. Cambridge University Press.
Chen, Y. (2015). Developing Chinese EFL learners' email literacy through requests to faculty. *Journal of Pragmatics, 75*, 131–149. https://doi.org/10.1016/j.pragma.2014.05.009
Cheng, D. (2017). Communication is a two-way street" Instructors' perceptions of student apologies. *Pragmatics, 27*(1), 1–32. https://doi.org/10.1075/prag.27.1.01che
Economidou-Kogetsidis, M. (2011). Please answer me as soon as possible": Pragmatic failure in non-native speakers' e-mail requests to faculty. *Journal of Pragmatics, 43*(13), 3193–3215. https://doi.org/10.1016/j.pragma.2011.06.006
Economidou-Kogetsidis, M. (2015). Teaching email politeness in the EFL/ESL classroom. *ELT Journal, 69*(4), 415–424. https://doi.org/10.1093/elt/ccv031
Economidou-Kogetsidis, M. (2016). Variation in evaluations of the (im)politeness of emails from L2 learners and perceptions of the personality of their senders. *Journal of Pragmatics, 106*, 1–19. https://doi.org/10.1016/j.pragma.2016.10.001
Economidou-Kogetsidis, M., Woodfield, H., & Savvidou, C. (2020). Non-native EFL teachers' email production and perceptions of e-(im)politeness. *Journal of Politeness Research, 17*(2), 155–187. https://doi.org/10.1515/pr-2020-0046
Feuerstein, R., Rand, Y., & Hoffman, M. B. (1979). The dynamic assessment of retarded performers: The learning potential assessment device. *Theory, instruments, and techniques*. University Park Press.
Glutting, J. J., & McDermott, P. A (1990). Principles and problems in learning potential. In C. R. Reynolds, & R. W. Kamphaus (Eds.), *Handbook of psychological and educational assessment of children: Intelligence and achievement*. Guilford.
Hartford, B., & Bardovi-Harlig, K. (1996). "At your earliest convenience": A study of written student requests to faculty. In L. Bouton (Ed.), Urbana-campaign: Division of English as an international language, pragmatics and language learning (Vol. 7, pp. 55–69). University of Illinois.
Hendriks, B., van Meurs, F., & Kakisina, B. (2023). The effects of L1 and L2 writers' varying politeness modification in English emails on L1 and L2 readers. *Journal of Pragmatics, 204*, 33–49. https://doi.org/10.1016/j.pragma.2022.12.006
Hudson, T. (2001). Indicators for pragmatic instruction: Some quantitative tools. In K. R. Rose, & G. Kasper (Eds.), *Pragmatics in language teaching* (pp. 283–300). Cambridge University Press.
Hudson, T., Detmer, E., & Brown, J. D. (1995). *Developing prototypic measures of cross-cultural pragmatics*. University of Hawai'i. Technical Report 7.
Ishihara, N., & Cohen, A. (2022). *Teaching and learning pragmatics: Where languages and culture meet* (2nd ed.). Routledge.
Kozulin, A., & Garb, E. (2002). Dynamic assessment of EFL text comprehension. *School Psychology International, 23*, 112–127.
Lantolf, J.P., & Appel, G. (1994). Vygotskian approaches to second language research (J. P. Lantolf & G. Appel, Eds.). Ablex Publishing.
Lantolf, J. P., & Poehner, M. (2004). Dynamic assessment: Bringing the past into the future. *Journal of Applied Linguistics, 1*, 49–74. https://doi.org/10.1558/japl.v1.i1.49
Lazarescu, R.C. (2020). L2 Pragmatics in an English-medium University Setting: Examining the Production and Perception of Requests in Business Students' Email Writing. Universidad Complutense de Madrid, Spain. Unpublished PhD Thesis.
Lidz, C., & Gindis, B. (2003). Dynamic assessment of the evolving cognitive functions in children. In A Kozulin, B. Gindis, V. S Ageyev, & S. M. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 99–116). Cambridge University Press.
Nguyen, T. (2018). Pragmatic development in the instructed context. *Pragmatics, 28*(2), 217–252. https://doi.org/10.1075/prag.00007.ngu
Nguyen, T., Do, T., Nguyen, A., & Pham, T. (2015). Teaching email requests in the academic context: A focus on the role of corrective feedback. *Language Awareness, 24*(2), 169–195. https://doi.org/10.1080/09658416.2015.1010543
Nguyen, T. T. M., Do, T. T. H., Pham, T. T. T., & Nguyen, T. A. (2019). The effects of corrective feedback with and without revision on enhancing L2 pragmatic performance. *Applied Pragmatics, 1*(1), 1–25. https://doi.org/10.1075/ap.00001.min
Nicholas, A. (2020). Dynamic assessment and requesting: Assessing the development of Japanese EFL learners' oral requesting performance interactively. *Intercultural Pragmatics, 17*(5), 545–575. https://doi.org/10.1515/ip-2020-5002
Nicholas, A. (2018). Profiling the development of a Japanese EFL learner's interactional competence: A dynamic assessment of requesting-in-interaction. *JLTA Journal, 21*, 42–64. https://doi.org/10.20622/jltajournal.21.0_42
Nicholas, A., Blake, J., Mozgovoy, M., & Perkins, J. (2023). Investigating pragmatic failure in L2 English email writing among Japanese university EFL learners. *Register Studies, 5*(1), 23–51. https://doi.org/10.1075/rs.20016.nic
Nicholas, A., Blake, J, Perkins, J., & Mozgovoy, M. (2024). Evaluating the effectiveness of a computerised dynamic assessment of L2 English email requests. *Computer Assisted Language Learning*, 1–33. https://doi.org/10.1080/09588221.2024.2374775
Poehner, M. (2008). Both sides of the conversation: The interplay between mediation and learner reciprocity in dynamic assessment. In J. Lantolf, & M. Poehner (Eds.), *Sociocultural theory and the teaching of second languages* (pp. 33–56). Equinox Publishing.
Poehner, M., & Lantolf, J. (2010). Vygotsky's teaching-assessment dialectic and L2 education: The case for dynamic assessment. *Mind, Culture, and Activity, 17*(4), 312–330.
Poehner, M. E., & Lantolf, J. P. (2024). *Sociocultural theory and second language developmental education*. Cambridge University Press. https://doi.org/10.1017/9781009189422
Poehner, M., Zhang, J., & Lu, X. (2015). Computerized dynamic assessment (C-DA): Diagnosing L2 development according to learner responsiveness to mediation. *Language Testing, 32*(3), 337–357. https://doi.org/10.1177/0265532214560390
Qin, T., & van Compernolle, R. A. (2021). Computerized dynamic assessment of implicature comprehension in L2 Chinese. *Language Learning & Technology, 25*(2), 55–74. http://hdl.handle.net/10125/73433.
Ren, W., Shaofeng, L., & Xiaoxuan, L. (2022). A Meta-analysis of the effectiveness of second language pragmatics instruction. *Applied Linguistics, 44*(6), 1010–1029. https://doi.org/10.1093/applin/amac055
Savic, M. (2018). Lecturer perceptions of im/politeness and in/appropriateness in student e-mail requests: A Norwegian perspective. *Journal of Pragmatics, 124*, 52–72. https://doi.org/10.1016/j.pragma.2017.12.005
Tang, Y., & Ma, X. (2023). An interventionist dynamic assessment approach to college English writing in China. *Language Assessment Quarterly, 20*(1), 44–65. https://doi.org/10.1558/lst.v2i2.25956
Uso-Juan, E. (2022). Exploring the role of strategy instruction on learners' ability to write authentic email requests to faculty. *Language Teaching Research, 26*(2), 213–237. https://doi.org/10.1177/13621688211066997
van Compernolle, R. A. (2013). Interactional competence and the dynamic assessment of L2 pragmatic abilities. In S. J. Ross, & & G. Kasper (Eds.), *Assessing second language pragmatics* (pp. 327–353).
van Compernolle, R. A., & Kinginger, C. (2013). Promoting metapragmatic development through assessment in the zone of proximal development. *Language Teaching Research, 17*(3), 282–302. https://doi.org/10.1177/1362168813482917
Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
Winans, M. D. (2020). Email requests: Politeness evaluations by instructors from diverse language backgrounds. *Language Learning and Technology, 24*(2), 104–118. http://hdl.handle.net/10125/44728.