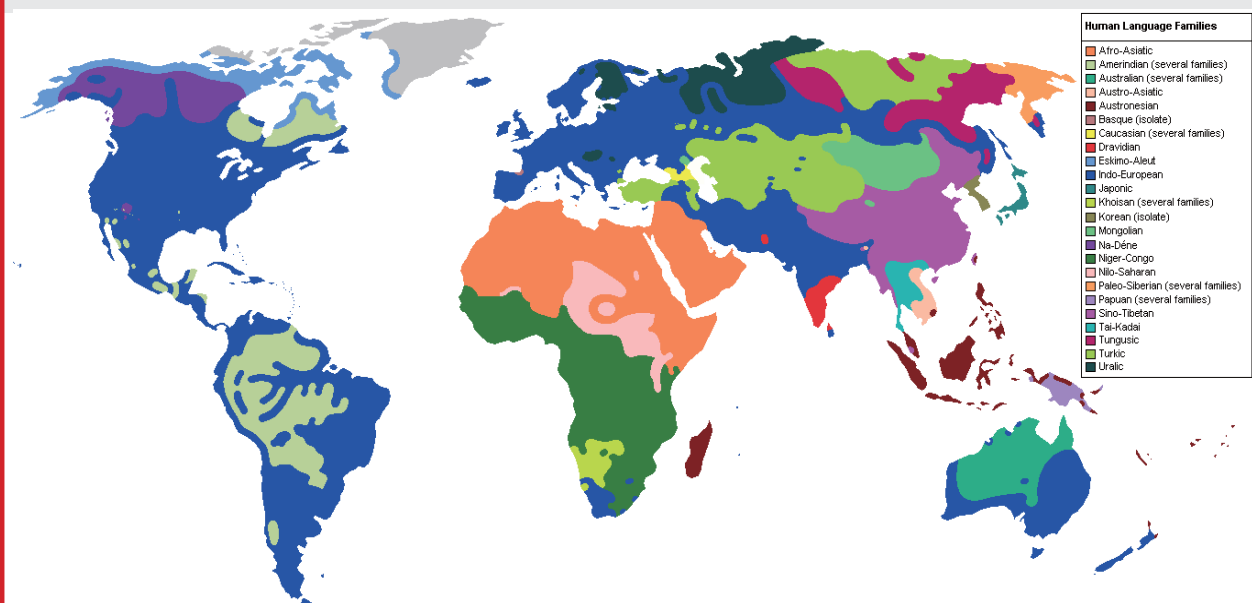


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# Discourse-Pragmatic Variation Across Situations, Varieties, Ages: I Don't Know in Sociolinguistic and Medical Interviews

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**Abstract.** Our analysis of i don't know (IDK) variability in four sub-corpora of sociolinguistic and mental health interviews clarifies the context-dependency of discourse-pragmatic variation, and demonstrates the translational potential of socially responsible, linguistic research. Systematic and accountable analysis of over 700 tokens of IDK in these data reveals that while IDK variants, functions and syntactic configurations are differentially distributed across situation, variety and age, form-function correlations in IDK use are robust across these parameters. These results demonstrate that discourse-pragmatic variables such as IDK retain some probabilistic relationships that aid in consistent interpretation across contexts of use, while other aspects of variability are used in stylistically distinct ways across e.g. situations and social groups. Moreover, our analysis of IDK in mental health interviews shows how the variationist analysis of site-particular communicative practices can uncover language variation patterns that have the potential to affect practice, research and teaching outside of the sociolinguistics community.

**Keywords:** i don't know; Discourse-pragmatic variation; Situational context; Doctor-patient communication; British and American English.

## 1. Introduction

The sociolinguistic interview is a mainstay of variationist methodology and continues to constitute the primary data source for studies of language variation and change.<sup>1</sup> However, some variationists have successfully utilized other data sources and demonstrated how their analyses allow investigation of contextual effects on language use not readily observable in sociolinguistic interview data. Coupland (1980), for example, recorded interactions at a travel agency to characterize the effect on linguistic variation of situational factors that are invariable in (one-to-one) sociolinguistic interviews: participant and channel. Other scholars ventured to playgrounds and schools (Cheshire, 1982) or barbecues and hospitals (Podesva, 2007) to observe the impact of situational context on language use; moreover, recent research has made use of diverse corpora to compare language use across workplace and classroom settings (Holmes and Schnurr, 2006 and Schleef, 2008a; see also Chaemsathong (2012) for a theoretical discussion of situational linguistic variation). In this paper, we support both the extension of variationist analyses beyond the sociolinguistic interview and the cross-situational analysis of language variation patterns (e.g. Finegan and Biber, 1994 and Finegan and Biber, 2001) while also attending to the effects of more widely studied social predictors such as variety and age.

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<sup>1</sup> Becker (2013) draws attention to the inconsistent use of the term 'sociolinguistic interview': some use it broadly to refer to any face-to-face interaction between members of a speech community and a linguistic researcher that is recorded for the analysis of sociolinguistic variation and change; others use it more narrowly to refer to the techniques developed by Labov (1966, 1984) for the systematic elicitation of different contextual speech styles from individual speakers. In this paper, we apply the label 'sociolinguistic interview data' to any naturalistic speech data obtained for variation analysis in an informal interview setting and involving a linguistic fieldworker, regardless of whether the interview protocol is structured to elicit different contextual styles.

Our investigation focuses on the construction *i don't know* (IDK)<sup>2</sup> in two situationally distinct yet structurally comparable settings: sociolinguistic and mental health interviews. It is motivated by our aims to: (i) clarify the role of situational factors in linguistic variation and advance our understanding of the nature of discourse-pragmatic variability (see Pichler, 2010, p. 586); (ii) explore new impact strategies for variationist research that, if developed in close collaboration with medical practitioners, may benefit mental health patients (PTs) of different dialects and ages. To meet these objectives, our data are differentiated not just by situational context; the medical interview data are further differentiated by variety (British vs. American English) and broadly construed age groups (adolescent vs. young adult vs. adult). Our variationist analysis of the variable functional, morpho-phonological and syntactic properties of IDK in these data allows us to explore both inter- and intra-situational differences in IDK use, and establish to what extent different dimensions of discourse-pragmatic variability are generalizable beyond the immediate contexts, varieties and/or social groups in/by which they were produced. Moreover, the analysis of mental health data affords us the opportunity to identify situation-specific patterns of IDK use and propose ways in which health-care practitioners' (DRs') knowledge of these patterns could affect diagnosis and treatment decisions.

Previous (largely non-variationist) studies of IDK in non-medical discourse, including media, courtroom and sociolinguistic interviews as well as casual conversations, have shown that the function, form and syntax of IDK are highly variable.<sup>3</sup> IDK functions as a cognitive claim of insufficient knowledge and a non-cognitive interactional device with interpersonal, face-saving functions as well as textual, turn-exchange or topic-development functions (e.g. Beach and Metzger, 1997, Pichler, 2009, Pichler, 2013, Potter, 1996, Tsui, 1991, Weatherall, 2011 and Wooffitt, 2005). The construction's form is variable in terms of the vowel quality in *don't* (full vs. reduced) and the morpheme boundary between *don't* and *know* (audible vs. non-audible), locating variants on a continuum of articulatory reduction (Bybee and Scheibman, 1999, Pichler, 2009, Pichler, 2013 and Scheibman, 2000). In terms of syntax, IDK variably occurs without overt complementation, with a dependent *wh*-word, or with a dependent phrasal or clausal complement (Pichler, 2013, p. 77–78). Example (1) from our mental health interview data shows that the variability of IDK with respect to its function, form and syntax extends to talk in this situational context.<sup>4</sup> When questioned about his recent mental wellbeing, the adolescent PT in (1) uses IDK with non-cognitive (*I dunno*-1) and cognitive functions (*I don't know*-2, *I don't know*-3), in its reduced and full forms (*I dunno*, *I don't know*) as well as without (*I dunno*-1) and with dependent complements (*I don't know*-2, *I don't know*-3).

In this paper, we build on previous studies of IDK to explore whether and to what degree the construction's linguistic variability illustrated above is constrained by the extra-linguistic factors situation, variety and age. A wealth of studies have documented that the frequency, function, form and positioning of discourse-pragmatic variables is affected by: (i) a range of social factors, including: age, sex, ethnicity, socio-economic background, community of practice membership, locality (e.g. Andersen, 2001, Cheshire, 1981, Cheshire, 2007, D'Arcy, 2005, Drager, 2016, Erman, 1992, Erman, 2001, Ferrara, 1997, Fuchs and Gut, 2016, Holmes, 1995, Macaulay, 2005, Moore and Podesva, 2009, Pichler, 2016, Stubbe and Holmes, 1995 and Waters, 2013); and (ii) diverse situational and interactional parameters, including: discourse type and activity context; topic, purpose and attitudes to the interaction; speaker roles and relationships; and communicative channel (e.g. Cameron et al., 1988, Escalera, 2009, Freed and Greenwood, 1996, Fuller, 2003, Jucker and Smith, 1998, Kyratzis and Ervin-Tripp, 1999, Lam, 2009, Mauraanen, 2004, Redeker, 1990, Schleef, 2008b, Stubbe and Holmes, 1995 and Verdonik et al., 2009). However, we hypothesise that not all dimensions of discourse-pragmatic variation are affected by social and situational factors. Bybee and Scheibman's (1999) and Pichler's (2013) analyses of IDK in American English (AmE) casual conversations and British English (BrE) sociolinguistic interviews reveal identical form-function correlations in the construction's use: in both datasets, phonetically full IDK variants are strongly associated with cognitive uses while phonetically reduced variants are associated with non-cognitive uses. Notwithstanding the fact that Bybee and Scheibman's and Pichler's results are not reliably

<sup>2</sup> The term 'construction' is used here and throughout in a pre-theoretical way to refer to syntagmatic strings.

comparable,<sup>5</sup> they suggest that when variation in form and function are correlated, discourse-pragmatic variation patterns may be consistent across situational contexts and, possibly, varieties. Furthermore, Pichler's results suggest that these correlation patterns are only marginally affected by social factors.

Our following variationist analysis sets out to reliably test the hypothesis that while the distribution of IDK's forms, functions and syntactic configurations is inconsistent across extra-linguistic contexts, form-function correlations in IDK use are maintained across these contexts. We therefore extend Pichler's (2013) variationist analysis of IDK in sociolinguistic interviews to BrE and AmE child/adolescent and adult mental health interviews, i.e., (semi-)structured interviews conducted by DRs to assess their PTs' psychopathology and/or discuss their treatment plans and effects. The results confirm our hypotheses: while some but not all IDK variation patterns are robust, none of the patterns explored are straightforward indicators of social group membership or situational context.

Discussion of our medical interview results will also show how the insights from our variationist analysis of IDK might help overcome potential communicative barriers to effective healthcare provision, and improve DRs' diagnostic accuracy and therapeutic effectiveness when treating PTs with mental health disorders. In our mental health interview data, IDK occurs in a variety of contexts, including: answers to information requests (2); discussions of treatment options (3); and co-constructions of mutually satisfactory DR-PT relationships (4).

IDK, then, regularly occurs in tasks that are central to the medical interview and to the provision of PT-centred care (Frankel, 2002, p. 85; Heritage and Maynard, 2006, McWhinney, 1989 and Ong et al., 1995, p. 903–904), a view supported by Hutchby's (2002) work on IDK in naturally occurring child counselling sessions. Hutchby closely analysed of one six-year-old's recurrent use of IDK in response to counsellor questions about therapeutic topics, i.e., the child's supposedly problematic home environment (his parents' strained relationship, their conflicting explanations for their actions). The analysis revealed that the child strategically used IDK to frustrate the counsellor's lines of questioning and to resist talking on counselling-relevant topics. Crucially, the counsellor understood the child's particular IDK usage: at key points of the interaction, the child's IDK did not act as a non-cognitive strategic device but as an actual cognitive claim. This understanding enabled the counsellor to develop a therapeutically fruitful way of overcoming the child's resistance. Instead of re-stating questions or simply giving up, the counsellor validated the child in his resistance to talking by reassuring him that it was ok to 'not know' considering his young age and the difficulty of his situation. Hutchby's study thus illustrates the importance of DRs' ability to differentiate cognitive and non-cognitive uses of IDK in order to make successful therapeutic interventions. However, as Hutchby (2002, p. 164) points out:

it is not always immediately clear when children are in fact resisting, or even that they are resisting. The counsellor here is faced with the task of judging, in the course of the counselling session itself, what it is that the child's 'Don't know's are really doing.

Assuming that Hutchby's assessment of the therapeutic importance of correct IDK interpretation extends across mental health contexts, our variationist investigation of the context-, variety- and age-specific nature of IDK usage has the potential to facilitate successful DR-PT communication in this clinical context. It describes patterns of IDK usage specific to this context that, if deemed useful and relevant by practitioners, can be translated into empirical guidelines for DRs' interpretation of PTs' IDK function.<sup>6</sup> The research presented here thus explores the possibilities for future cross-disciplinary collaboration between variationist linguists and mental health providers to promote effective health communication.

The remainder of this paper is structured as follows: Section 2 introduces our data and methodology. Sections 3 and 4 present the results of the qualitative and quantitative data analyses. The theoretical implications and potential practical applications of the results are discussed in Section 5. Finally, Section 6 is the conclusion.

## 2. Data and methods

### 2.1. Corpora and data samples

In order to address the research aims set out in Section 1, we conduct a cross-situational, -variety and -age analysis of data drawn from: Pichler's (2013) private, 260,000-word sociolinguistic interview corpus collected in Berwick-upon-Tweed, north-east England; and the corporately owned, individually licensed Verilogue, Inc. database of audio-recorded DR-PT interactions (Kozloff and Barnett, 2006). Pichler's (2013) Berwick English (BwE) interview data were collected between 2003 and 2005 using the interview protocol designed for the Survey of Regional English to solicit information about informants' attitudes towards their locality and dialect and their use of local dialect words (Llamas, 2007). The original speaker sample was composed of 36 white, working-class speakers aged between 17 and 81, and was stratified by speaker sex and age. The Verilogue corpus contains a wide range of healthcare conversations, including routine, outpatient mental health consultations between paid psychiatrists practising in the UK and USA and their unpaid, consenting PTs (and their caregivers). The de-identified recordings and transcriptions, together with information about both DR (sex, years in practice) and PT (demographic information, diagnosis), are uploaded on secure servers in a fully searchable format. Our focus on mental health interviews (as opposed to other healthcare interactions) recorded in the UK and USA was motivated by our research aims set out in Section 1 and to facilitate comparison with qualitative literature on IDK use in this setting (Hutchby, 2002).

Though not solicited specifically for this purpose, the Verilogue medical interview data lend themselves to the analysis of sociolinguistic variation (see also Hesson, 2014) and to comparison with Pichler's (2013) sociolinguistic interview data. Although talk produced in this context may not be representative of PTs' most vernacular speech style (see Labov, 1972, p. 85), the medical data nonetheless contain abundant examples of vernacular features characteristic of casual speech styles (see, for example, the double negative in extract (5) or the use of discourse like and cos in extract (17)). Furthermore, the mental health interviews were conducted and recorded in quiet settings, and DRs recorded PTs' basic demographic information. This facilitates the reliable coding of IDK variants (see Section 2.2) and social factors. Notwithstanding minor differences between individual interviews, Pichler's (2013, p. 22–25) sociolinguistic interviews and the Verilogue mental health interviews share these characteristics: they follow a fairly structured question-answer format; they involve dyadic or triadic interactions between relative strangers whose roles are clearly defined as DR/interviewer and PT/interviewee; and they are primarily informational and only secondarily interpersonal. The structural, social and psychological similarity of the mental health interviews promotes their internal comparability as well as reliable comparison with Pichler's sociolinguistic interviews. The main difference between the medical and sociolinguistic interviews that is likely to impact participants' linguistic behaviour is in their respective physical settings and interactional goals: the former were conducted in institutional settings to gather information required for the diagnosis and treatment of mental health disorders; the latter were conducted in non-institutional settings to collect speech data for the analysis of linguistic variation. Thus, comparison of IDK variation patterns across the sociolinguistic interviews and the different sub-corpora of mental health interviews introduced below allows us to reliably assess the effect of situational context, variety and age on IDK variation.

The final sample composition was determined by our aims to investigate the effect on IDK variation of multiple contextual factors as well as by the recordings and demographic information available in the Verilogue database. To this end, we included in the analysis all BwE sociolinguistic interviews with adults aged  $\geq 18$  (Nspeakers = 27, Ntokens = 353) as well as random sub-samples of the following Verilogue mental health interviews: interviews recorded in the UK with adults aged  $\geq 18$  (Nspeakers = 14, Ntokens = 91); interviews recorded in the USA with adults aged  $\geq 18$  (Nspeakers = 33, Ntokens = 120); and interviews recorded in the USA with youth aged  $\leq 17$  (Nspeakers = 33, Ntokens = 150). The speaker samples in all sub-corpora are stratified by sex (male vs. female); the adult sub-corpora are further stratified by broad age groups (young adults aged 18 –

34 vs. adults aged 35+).<sup>8</sup> The age groupings in our data (youth =  $\leq 17$ -year-olds; young adults = 18 – 34-year-olds; adults = 35+-year-olds) are dictated by a combination of the following: variationist insights, i.e., the well-documented stabilization of speakers' vernaculars at age 17 (Labov, 2001, p. 447; Tagliamonte and D'Arcy, 2009, p. 66); traditional divisions in medical practice, i.e., that PTs aged  $\leq 17$  are seen by youth psychiatrists and those aged  $\geq 18$  by adult psychiatrists; and Verilogue's conventions of recording metadata, i.e., the fact that for adult PTs Verilogue provides age-brackets rather than discrete ages. Inclusion in our analysis of the combination of sub-corpora listed above allows for comparison of the effect on IDK variation of: situational context (BwE sociolinguistic vs. BrE mental health interviews); variety (BrE vs. AmE adult mental health interviews); and age (AmE adult vs. youth mental health interviews). Unlike the BwE sociolinguistic interview data, the mental health interview data were collected in a variety of locations across the UK and the USA; any results gauged from these data are therefore representative of a variety of speakers and regions rather than one particular speech community.

## 2.2. The dependent and independent variables: data coding

Careful inspection of the sub-corpora introduced in Section 2.1 yielded a coding file containing 714 tokens of the variable IDK, defined here as all forms 'derived from the same linear string of components schematized as: (first person singular pronominal subject) + (negative periphrastic do) + (predicate know)' (Pichler, 2013, p. 31).<sup>9</sup> To test the hypotheses set out in Section 1, each IDK token had to be coded for: its variant form, syntactic configuration, and discourse functionality; the sub-corpus in which it occurs; and the sex and age of its speaker. By coding each token of the variable for its linguistic characteristics (variant form, syntax, function), we allow for cross-corpora consideration of the independent distribution of these variable properties as well as the form-function relationship reported in the literature (see Section 1), thus catering to the multi-dimensional nature of discourse-pragmatic variation. Even if correlations between morpho-phonological form and discourse-pragmatic function were robust across situational context, variety and age (as determined by coding each IDK token for its sub-corpus), the independent proportional distributions of variant forms, functional categories and syntactic configurations of IDK may differ between sub-corpora irrespective of any form-function correlations found (see Section 1). By coding each IDK token for social predictors, we seek to establish the social robustness of IDK variation within corpora.<sup>10</sup>

The sociolinguistic sub-corpus had already been coded for the operation of the above constraints in Pichler, 2009 and Pichler, 2013 previous analysis of these data. Close inspection of a subset of the AmE youth medical interviews established that Pichler's (2013, p. 77–81) coding protocol for form and syntax could be extended without modification to our medical interview data. Thus, in terms of variant form, we initially divided IDK tokens into three form categories distinguished by their lack or degree of reduction. In full variants of IDK, orthographically represented as I don't know, the vowel in don't is realized with lip-rounding and a conspicuous morpheme boundary occurs between the nasals of -n't and know. In semi-reduced variants, orthographically represented as I dono, the first vowel is produced with lip-rounding but in contrast to the full variants there is no morpheme boundary between the two nasals. Finally, in reduced variants, orthographically represented as I dunno, the vowel in don't is reduced to a schwa and there is no audible morpheme boundary between the nasals. For our multivariate analysis in Section 4, we consolidate the three-way variant distinction into a two-way distinction of full vs. (semi)-reduced variants. In line with a step-wise theory of grammaticalization (Traugott and Trousdale, 2010), we suggest that the absence of an audible morpheme boundary between the nasals of -n't and know is the result of fusion and rebracketing, where '[f]usion [...] is a characteristic of the right-hand side of a continuum at the left of which are discrete morphs and at the right end a single morph' (Hopper and Traugott, 2003, p. 58). Unlike full variant forms, both the semi-reduced and reduced variant forms have undergone this step in the grammaticalization process, thus warranting their re-categorization as one variant form for quantitative purposes.

With regard to syntactic configuration, we differentiated between: unbound tokens of IDK without an overt complement (5a) versus bound tokens with a dependent wh-word (5b) or with a phrasal/clausal complement (5c).

Because the functionality of discourse-pragmatic variables is strongly context-dependent (see Section 1), we could not uncritically apply to our mental health interview data the functional taxonomy developed by Pichler (2013) to describe the use of IDK in the BwE sociolinguistic interview data. Such an approach would have risked yielding inadequate descriptions of IDK usage in medical interactions. Therefore, to develop a functional taxonomy of IDK use in mental health interviews, we adopted a bottom-up approach which involved close examination of every occurrence of IDK in these data and was informed by a detailed understanding of the interactional dynamics of medical interviews (Bergmann, 1992 and Heritage and Maynard, 2006). The methods used to establish the functionality of IDK tokens are introduced in more detail in Section 2.3 below; the schema developed for coding medical IDK tokens for function is detailed in Section 3, which presents the results of the qualitative analysis.

The basic procedures used to reduce the subjectivity of the functional analysis of IDK in the sociolinguistic interview data are described in Pichler (2013: 48). To further avoid biasing the analysis of the medical data, we adopted the following practices for linguistic predictors. First, we independently coded the form, syntax and function of all medical IDK tokens. To the extent possible, the second author focused exclusively on the morpho-phonological form and syntactic configuration of medical IDK tokens while the first author focused exclusively on their discourse-pragmatic function. Throughout, we were blinded to each others' codings. Next, we swapped coding roles to determine inter-rater reliability. The first author blindly coded a random sub-sample of 20% of IDK tokens in each medical sub-corpus for function while the first author coded the same tokens for form and syntax. This process revealed the following percent-match levels of agreement between coders: 87% for form; 98% for syntax; and 78% for function, indicating acceptable levels of inter-rater reliability across linguistic predictors (see further Wagner et al. (2015) for expected levels of inter-reliability in discourse-pragmatic function coding).<sup>11</sup> Tokens whose form, syntax or function categorization proved contentious or otherwise problematic were brought to collaborative attention and interrogated until inter-coder agreement was reached.

### 2.3. Methods of data analysis

As stated above, the IDK tokens in the sociolinguistic interviews had already been coded for function by Pichler (2013). To develop a taxonomy of IDK functions in the mental health interviews, we adopted a bottom-up approach. Like Pichler (2013), we heavily drew on key insights from conversation analysis (Atkinson and Heritage, 1984 and Schegloff, 2007) to inform our interpretation of the data, making our method comparable to hers yet sensitive to context-specific IDK use. In the identification and allocation of IDK functions, we thus paid systematic attention to the sequential context of the turns containing IDK, the temporal development of the interaction, as well as to the ambient linguistic context, including other discourse-pragmatic variables, (un)filled pauses, and the prosodic encodings of IDK. These features are interactionally significant and served to disambiguate the construction's functions in a given context. Also, utterance interpretation was guided by next speakers' treatment of preceding talk.

In order to identify and account for patterns of IDK variation in the data, we first compared the overall form, function and syntax distribution of IDK across the four sub-corpora, employing the Pearson  $\chi^2$ -test to assess statistical levels of significance in variation patterns. We then performed mixed-effect logistic regression analyses (in Rbrul, Johnson, 2009) for each of the sub-corpora, predicting the full variant I don't know as opposed to a combined category of (semi-)reduced variants (I dono, I dunno). Multiple logistic regression analysis was selected as our primary quantitative method because it allowed for the identification of statistically significant correlational patterns in the distribution of IDK forms, functions and social co-variants. Identical cross-corpora analyses were conducted and compared to: (1) uncover any cross-corpora differences in the variants' underlying grammar; and (2) test our hypothesis that form-function correlations are robust across situational contexts, varieties and age groups. To mitigate adverse effects of badly distributed data and meet the frequency thresholds for viable statistical modelling (Guy, 1980), we configured function along the three domains, referential, interpersonal and textual (see Section 3.7). Additionally, because of its interaction with function, syntax was not included as a predictor in the multivariate analyses. Finally,



we included individual speaker as a random effect in the regressions to reduce the risk of providing inaccurate significance estimates of social factors.

### 3. Qualitative analysis: functions of IDK in mental health and sociolinguistic interviews

In this section, we provide an overview of the functional repertoire of IDK in our data which we derived through application of the methods outlined in Section 2.3. The novelty and contribution of what follows lies in: (i) developing Hutchby's (2002) case study of IDK into a large-scale qualitative review of IDK in medical consultations to provide a more comprehensive description of the construction's functional spectrum in this situational context; (ii) demonstrating that the functional diversity identified for IDK in other situational contexts (see Section 1 for details) extends to medical interviews; and (iii) illustrating that the construction's interactional effects at times strongly depend on its situational context of use. Our comprehensive description of IDK functions in our mental health interview data enables us to illustrate the importance of differentiating the multitude of functions IDK performs in medical practice (see Section 5.2). For these reasons and because a detailed overview of IDK functions in sociolinguistic interviews is provided in Pichler (2013, p. 81–99), the focus below will be on describing IDK functions in mental health interviews. We briefly outline how we arrived at the functional categorizations of tokens (see further Pichler, 2013, p. 81–99; Hesson and Pichler, MS), and provide information about contextual features that typify individual functional categories and contribute to the disambiguation of IDK meanings.<sup>12</sup>

For the medical interview data, we initially developed a micro-taxonomy of IDK functions reflecting the construction's high functional versatility as well as individual tokens' intrinsic polyfunctionality. However, the lack of robust mutual exclusivity between the resulting categories made us question the objectivity and practicality of differentiating subtle nuances of IDK meaning, especially if the taxonomy is to be: (a) quantified to test our hypotheses about IDK variability; and (b) applied in clinical settings where DRs would have to interpret the functionality of IDK on-line in interaction and, in most cases, without our specialist knowledge of discourse functionality. We therefore reconfigured our initial micro-taxonomy of IDK into a macro-taxonomy of six functional categories (see Table 1 in Section 3.7). These categories are sufficiently distinct to capture the construction's functional versatility in the data without sacrificing their heuristic value for identifying patterns of variation in IDK use or jeopardising their applicative value for interpreting PTs' IDK use in real time. Yet at the same time, they are respectful of the construction's intrinsic multifunctionality. They incorporate tokens that are subtly different in meaning but perform comparable and overlapping interactional functions (see further Sections 1, 2 and 3). Finally, the application of this taxonomy across the medical sub-corpora led to levels of inter-rater agreement comparable to those reported for other discourse-pragmatic variables (Wagner et al., 2015; see further Section 2.2), making the analysis (and its future application in medicine) more reliable.

Below we proceed as follows. We first distinguish in Sections 1, 2 and 3 six broad categories of IDK use (cognitive claim, epistemic marker, mitigation device, avoidance/resistance strategy, turn-exchange device, topic development device). We then classify the six functional categories into the three domains: referential, interpersonal, textual (see Section 3.7); this will highlight the context-sensitivity of IDK use and facilitate the quantification of the data in Section 4. Where possible, we illustrate each of the six functional categories with one example from the sociolinguistic interview data and at least one from the mental health interview data. The examples are presented in their larger sequential and interactional context of occurrence, and the typographical means detailed in Footnote 4 are employed to replicate accompanying paralinguistic and prosodic features. As shown below, these details informed data interpretation. Where individual data extracts contain multiple instances of IDK, it is the bolded token that is the focus of the preceding commentary.

#### 3.1. Cognitive claim of insufficient knowledge

Sociolinguistic interviewees (IVEs) and mental health PTs regularly use IDK to claim a cognitive state, i.e., lack of knowledge. As illustrated in (6) and (7), cognitive tokens of IDK most often occur in direct response to interviewer (IVR)/DR information questions where they signal IVEs'/PTs' cognitive inability to supply the requested information. The interpretation of these tokens as

knowledge disavowals is supported by the following discourse: the IVE in (6) follows IDK with another, emphatic declaration of his lack of knowledge (I've nay idea); the PT in (7) follows his initial emphatic knowledge disavowal (I don't even know) with an elaborate account for the declared knowledge gap: because his father is not an accessible source of information, the PT is unable to provide the DR's requested information about his mental health. Unlike, for example, epistemic or turn-holding IDK tokens (see Sections 3.2 and 3.5), cognitive IDKs are not generally produced with rising intonation and/or accompanied by other discourse-pragmatic features, filled or unfilled pauses.

In mental health interviews, cognitive IDK tokens also occur in assessment sequences about PTs' symptoms, anxieties, and behaviour patterns. In the example in (8), where the knowledge disavowing interpretation of IDK is supported by its modification with *even*, the PT uses IDK to communicate his lack of understanding with respect to concerning experiences: he does not know or understand whether his feelings are clinically relevant, and is unable to provide contextualizing information that may account for his mood swings. In this particular context, IDK simultaneously functions as an appeal for help and clarification.

In (9), IDK occurs in a memory assessment routine. When the child struggles to list two of the three words that the DR had asked him to recall (brown, honesty, tulip), he uses IDK (consistently produced with primary stress on *know*) to signal his lack of familiarity with honesty and tulip. Our interpretation of this token as cognitive rather than resistive (see Section 3.4) is supported by the fact that the child PT is cooperative throughout the interview and later asks the DR specific questions to establish what kind of flower tulips are. The DR's reaction to the child's knowledge disavowals demonstrates the importance for DRs to appropriately respond to PTs' use of IDK. The DR expresses astonishment at the child's apparent deficit (You don't know that word? You never heard of a tulip flower?), at one time even raising his voice (as indicated by capital letters). For a child who may still be internalizing the purpose and benefits of psychiatric care (Tates et al., 2002), this on-record, exaggerated response from the psychiatrist, precipitated in part by his own failure to recognize the function of IDK in the preceding exchange, could have short- and long-term deleterious effects (see further Section 5.2).<sup>13</sup>

### 3.2. Epistemic marker

As predicted by previous research (e.g. Beach and Metzger, 1997 and Tsui, 1991), IDK is not solely used in our data to signal a cognitive state. In both sociolinguistic and medical interviews, IDK regularly functions as an epistemic marker. In (10) and (11), the speakers follow/preface their propositions with IDK to qualify the reliability of their assessments, and to mitigate their accountability for their accuracy. The attenuating effect of IDK is reinforced by the fall-rise intonation contour (example 10) and its co-occurrence with other hedging devices (probably, or something like that in (10); maybe, about in (11)). Its use in (11) warns the DR that his PT may in fact be abusing drugs/alcohol more regularly than he is prepared to admit.

### 3.3. Mitigation device

Speakers sometimes exploit the uncertainty inherent in IDK to mitigate the potentially face-threatening effect of disagreements, as in (12), or to balance social asymmetries, as in (13). DR-PT relationships are inherently asymmetrical due to 'differences in status and domain specific knowledge' (Tates and Meeuwesen, 2000, p. 152). By couching his indirect medication recommendation in uncertainty (I don't know if I should (.) we should bump it up), the PT in (13) puts himself into a (discursively) subordinate and less knowledgeable position to that of the DR, thus avoiding a direct move to undermine the DR's expertise and authority. (Also note the change in pronoun from I to we to involve the DR in the decision-making process.)

### 3.4. Avoidance/resistance strategy

An IDK function that is not represented in our sociolinguistic interview data but that is very prominent in our (youth) mental health interview data is that highlighted in Hutchby (2002): IDK as an avoidance/resistance strategy. When the DR in (14) raises issues related to the PT's problematic home environment, the PT responds with IDK. As indicated by the DR's reaction (I'll (..) probably talk to you in a minute. Without your father), he interprets the PT's use of IDK as an avoidance device; he delays pursuing of the therapeutically relevant topic until the caregiver has left the room, at which

point the PT willingly engages with the DR's topic (not all reproduced below). The PT's final turn in (14) confirms the DR's interpretation of his earlier IDK as an avoidance strategy: in the presence of his father, the PT was reluctant to engage with a topic that his mother had explicitly told him not to discuss with the DR.

In (15), the PT makes a point of letting the DR know that she is not attending the consultation out of her own volition (Except for when you take me out of school and take me here. Then I'm not as happy of a person.). She reacts to most of the DR's questions with minimal responses that she only rarely elaborates on (e.g. by providing an account for her non-answers): no/nope, sure and IDK. The systematic non-cooperation signalled by the PT's persistent use of these response devices frustrates the DR's attempt to elicit talk on all topics associated with therapeutic matters. They also serve as a face-saving strategy, for example when the PT admits her non-adherence to medication.

Unlike cognitive or epistemic IDK tokens, avoidance/resistance tokens of IDK usually constitute the sole element of a turn. Moreover, they are not generally accompanied by the provision of a hedged response or an account for the declared knowledge gap.

### 3.5. Turn-exchange device

In addition to the interpersonal uses of IDK outlined above, IDK is also used in the textual domain to affect and prevent turn-transfer between participants. Beyond using IDK in turn-initial and -final position to launch and yield turns (see Pichler, 2013, p. 87–91 for examples), IVEs and PTs use IDK turn-medially to secure their hold on the floor while they are planning the continuation or re-formulation of their multi-unit turns.<sup>14</sup> In the illustrative examples in (16) and (17), IDK is used to bridge the gap between aborted and continued, recast or reformulated utterances. As illustrated, these IDK tokens tend to co-occur with filled and unfilled pauses and other discourse-pragmatic features, particularly those signalling turn continuation (and, but).

### 3.6. Topic-development device

Finally, IDK is used by IVEs and PTs in our data to affect the topic development of interviews. In (18), the IVE's use of IDK in response to the IVR's follow-up question serves to decline the proffered topic by disavowing access to it. The closure-implicative effect of IDK is attested in the IVR reaction which is to almost immediately move on to the next interview question. The PT's non-bolded, turn-final token of IDK in (8) in Section 3.1 illustrates this function in the mental health interview data. The PT struggles to explain his feelings and symptoms; he uses IDK to successfully terminate his attempt to do so (see the DR's immediate up-take of the floor). (See also the non-bolded, turn-final token of IDK in (13) in Section 3.3.) The terminating effect of these IDK tokens is reinforced by their terminating intonation, i.e., a falling boundary tone.

### 3.7. Summary: IDK functions in sociolinguistic and mental health interviews

Table 1 compares the functional taxonomies developed from the analyses of IDK in the sociolinguistic and mental health interviews. To highlight cross-situational similarities and differences in IDK use, it classifies functional categories according to domains of use: referential, interpersonal (concerned with the expression of speaker attitudes and co-ordination of speaker–hearer relationships) and textual (relating to the development and organization of discourse) (see Brinton, 1996 and Halliday, 1979). Thus, while IDK is used in both interview contexts to signal a cognitive state, hedge or mitigate propositions, prevent turn transfer, and affect topic development, the medical interview taxonomy features more interpersonal functions than the sociolinguistic interview taxonomy. The presence in the medical interview data of the interpersonal avoidance/resistance category is due to situation-specific social roles and interactional demands. In both the medical and sociolinguistic interviews, IDK frequently occurs as the (near-)sole turn component in second pair parts of question-answer adjacency pairs. In the medical interviews, where the DR/IVR occupies a more powerful role than the PT/IVE (Pilnick and Dingwall, 2011 and Ten Have, 1991), such tokens tend to be used in response to counsellor questions on mental health-related issues, and serve to disrupt conversation related to assessment or treatment, i.e., issues with potentially deleterious implications for PTs' desired progression of the consultation as well as their healthcare management (see (14) above). As such, these tokens perform important face-saving functions, warranting categorization in the interpersonal domain. By contrast, in the sociolinguistic interviews, where the

IVE has little personal stake in the interview progression, such tokens tend to occur in response to IVR questions about non-personal matters and function as role-congruent displays of the IVE's relative control over topic selection (see (17) above). As such, these tokens affect the topical development of interviews, warranting categorization in the textual domain. Thus, our analysis of IDK use in medical and sociolinguistic interview data demonstrates that IDK tokens in identical sequential contexts can have vastly differential interactional effects across situational contexts of use.

#### 4. Quantitative analysis: IDK variation patterns

In this section, we examine the distribution of form, function and syntax for IDK across a range of contextual factors, and test our hypothesis that form-function correlations in IDK use are robust across situational contexts, varieties and social groups.

Table 2 shows the distribution of IDK variants, functions and syntactic configurations across the four sub-corpora studied. A comparison of variation patterns across the BwE sociolinguistic interviews and the BrE medical interviews (columns 3 and 4) allows us to assess the effect of situational context on IDK variability. The comparison confirms previous reports that the functionality of discourse-pragmatic variables is significantly affected by situation ( $\chi^2 = 26.942$ ,  $p < 0.0001$ ): in sociolinguistic interviews, textual IDK uses outnumber referential and interpersonal uses; in the BrE (and AmE) adult medical interviews, referential tokens constitute the majority of IDK uses. At the same time, the comparison of the BwE sociolinguistic and BrE medical interviews reveals a previously undocumented effect of situational context on discourse-pragmatic variation, i.e., its effect on variant distribution: full variants are statistically less frequent in the sociolinguistic interviews than in the (BrE adult) medical interviews ( $\chi^2 = 40.305$ ,  $p < 0.0001$ ). Finally, unlike form and function, the syntactic configuration of IDK as bound or unbound seems to be unaffected by situational context ( $\chi^2 = 0.345$ ,  $p = 0.56$ ).

The contribution to IDK variation of situational context stands in stark contrast to that of variety, as gauged from a comparison of variation patterns in the BrE and AmE adult medical interviews (columns 4 and 5 in Table 2). In this particular interview context and age group, neither the form ( $\chi^2 = 1.3235$ ,  $p = 0.25$ ) nor syntactic configuration ( $\chi^2 = 0.1244$ ,  $p = 0.72$ ) of IDK are significantly affected by variety: in both varieties, full variants outnumber (semi-)reduced variants; and unbound and bound tokens occur with roughly similar frequency. Function differentiates BrE and AmE adult PTs ( $\chi^2 = 7.1924$ ,  $p = 0.03$ ). However, in both varieties, referential IDK uses outnumber the interpersonal and textual IDK uses combined.

Finally, a comparison of our AmE adult and youth medical interviews (columns 5 and 6 in Table 2) confirms the results reported for BwE sociolinguistic interviews (Pichler, 2013): age only minimally affects IDK form variation ( $\chi^2 = 0.0363$ ,  $p = 0.85$ ) but significantly affects IDK function variation ( $\chi^2 = 30.021$ ,  $p < 0.0001$ ). In both the adult and youth medical interviews, full and (semi-)reduced variants of IDK occur with roughly similar frequency. However, while referential IDK uses dominate (BrE and AmE) adult medical interviews, interpersonal IDK use accounts for almost half of all IDK tokens in the youth medical interviews. The syntactic configuration of IDK also varies across age in medical interviews ( $\chi^2 = 8.6857$ ,  $p < 0.0032$ ): bound IDK is significantly more frequent in the adult than the youth medical data, possibly because of the strong association of bound tokens with referential uses. In sum, then, situational context significantly affects both the form and function of IDK use; variety minimally affects its (non-cognitive) functional distribution; age significantly affects IDK function and, to a lesser extent, IDK syntax.

To establish any form-function correlations in our data and to uncover the configuration of factors contributing to variant choice, we next conduct four independent, sample-specific logistic regression analyses (one for each sub-corpus) predicting the occurrence of the full variant I don't know across IDK functions, speaker sex, and speaker age. Table 3 shows the results. As indicated by the range values for significant predictors, function consistently makes the most important contribution to the occurrence of I don't know. Across the sub-corpora, the full variant is strongly favoured for referential IDK uses and disfavoured for interpersonal and textual uses. Thus, although IDK variants and functional domains are differentially distributed across contextual factors (see Table 2), our

hypothesis that form-function correlations in IDK use are robust across situational context, variety and age is confirmed. With the exception of age in the BrE adult medical interview data, social factors do not make a statistically significant contribution to variant choice. Note, however, that the full variant I don't know is non-significantly trending towards an association with adults and females (as opposed to young adults and males).

## 5. Discussion

The aim of our study was to test the effect of situational context, variety and age on IDK variability while also exploring a new prospective application for variationist linguistic research. To this end, we conducted principled and accountable analyses of the construction's usage and distribution across four sub-corpora differentiated along relevant parameters. Our analyses produced important new insights into the nature and extent of discourse-pragmatic variation which we will summarize and discuss in Section 5.1. Moreover, we will suggest in Section 5.2 ways in which the results of our proof-of-concept analyses, if further developed in collaboration with mental health practitioners, might benefit DR-PT communication.

### 5.1. Theoretical and methodological implications

Our auditory, discourse-analytic and structural analyses of the IDK data reported above distinguish situationally labile patterns in IDK variation from those that are robust across contexts. They thus substantially clarify the IDK literature and set a new standard for multi-dimensional discourse-pragmatic variation analysis. Our analyses revealed that the morpho-phonological, functional and syntactic variability reported to characterize IDK use in other situational contexts (e.g. media, courtroom and sociolinguistic interviews, casual conversations; see Beach and Metzger, 1997, Bybee and Scheibman, 1999, Pichler, 2009, Pichler, 2013, Potter, 1996 and Scheibman, 2000) extends to both adult and youth mental health interviews. However, comparison of IDK use in the sociolinguistic and medical interview data also showed that despite considerable overlap, the functionality of IDK is not identical across interview contexts, confirming previous reports that the strategic use to which discourse-pragmatic variables are put is often highly context-specific (see e.g. Fuller, 2003, Lam, 2009, Schlee, 2008b and Verdonik et al., 2009). The lack of complete functional overlap in IDK use across our data was shown to be due to the existence in the medical data of an interpersonal function not found in the sociolinguistic interviews: the signalling of avoidance/resistance. Thorough characterization of this function is important for the development of a comprehensive taxonomy of IDK use across situational contexts as well as potential efforts to translate these findings into clinical practice. Moreover, it has important methodological implications. On the surface, the avoidance/resistance tokens of IDK in the medical interviews (see example (14) above where the PT uses IDK to frustrate the DR's line of questioning) resemble very closely the topic-declining tokens in the sociolinguistic interviews (see example (18) above where the IVE uses IDK to decline the IVR's proffered topic): they share the same sequential positioning in second pair parts of question-answer adjacency pairs, tend to constitute the (near-)sole constituent of a turn, and are generally phonetically reduced and produced with level or falling intonation. However, owing to our in-depth understanding of both datasets, we were able to establish important differences in PTs' and IVEs' seemingly uncooperative response behaviour that led us to characterize PTs' use as interpersonal and IVEs' as textual: PTs used these IDK tokens in an attempt to save face; IVEs used them in an attempt to exert some control over the topical development of the interview. Thus, our analysis cautions against the uncritical application of coding and quantification schemas developed for analyses of one situational context to analyses of data collected in another context.

The multivariate analyses revealed consistent form-function correlations in IDK use. The strong association across our sub-corpora of full variants with referential uses and of (semi-)reduced variants with interpersonal and textual uses is in line with Hopper's (1991, p. 24) Principle of Divergence whereby a construction becomes grammaticalized, i.e., undergoes morpho-phonological and semantic-pragmatic changes, in some environments but not others (see further Bybee and Scheibman, 1999 and Pichler, 2013, p. 118–120). Our results suggest that once variant forms have thus become imbued with specific meanings, these associations are robust, at least across the parameters tested

here: situation, variety, age. Pending further confirmation, we tentatively suggest that stable grammaticalization-induced form-function correlations identified in one dataset are likely generalizable to new datasets representing otherwise specialized speech settings.

The generalizability of discourse-pragmatic variation patterns does not apply to all dimensions of IDK use, however. Our distributional analysis established that in contrast to the robust form-function correlations discussed above, the distribution of variant forms, functional categories and syntactic configurations is not uniform across all the parameters differentiating our sub-corpora. This finding, i.e., that some aspects of IDK variation (i.e. form-function correlations) are robust across situational contexts while others (i.e. form, function and syntax distribution) are not, highlights the importance of analysing multiple dimensions of a single variable's use. This is particularly important if our aim is to yield accurate accounts of linguistic variation and improve our understanding of the nature of situationally-conditioned discourse-pragmatic variation (see also Wagner et al. 2016).

Finally, inspection of the variation patterns in our adult sociolinguistic and medical interview data reveals that the form and function distribution of IDK varies across but is consistent within situational context: in the BwE adult sociolinguistic interviews, IDK is used predominantly in its (semi-)reduced form for non-referential uses; across the BrE and AmE adult mental health interviews, by contrast, IDK is predominantly used in its full form for referential uses. It may be tempting to deduce from these patterns that IDK form and functionality are markers of situational context (see Traugott, 2001). Yet this hypothesis is refuted by the significantly different patterns of IDK use in the youth medical interview data. Here, IDK has a different functional profile than in the adult medical data, being used predominantly for non-referential (in particular interpersonal) functions. These results emphasize the importance of including social factors in analyses of situationally-conditioned language use.

Following Giles's (2001) and Traugott's (2001) proposals that speakers' subjective attitudes to and emotional assessments of situational contexts may affect their language use, and based on our in-depth understanding of our data, we tentatively suggest that adult and youth PTs' differential use of IDK in mental health consultations may reflect their differential construal of the speech situation. In our data, adult PTs tended to conceive of the consultation as an opportunity to learn more about their condition by detailing to the consultant what it is they do not know or understand about their symptoms and behaviours (see example (7) above). This is what may have triggered their high rate of cognitive IDK uses. Adolescents and children in our mental health interview data, by contrast, tended to conceive of the consultation as an unwelcome encounter that threatened their positive and negative face needs (see example (14) above). This is what may have triggered their high rate of avoidance/resistance IDK tokens. In short, we would like to posit that adults and youths may harbour differential subjective attitudes and assessments of mental health interviews, as reflected in their differential language use. This interpretation is supported by prior work suggesting that youths must be socialized into the interactional frame of medical consultations, a process that is largely encouraged by supportive parent and provider communicative practices (Tates et al., 2002). Future cross-situational analyses of discourse-pragmatic variation will therefore need to take account not just of social variation patterns but also of the potentially non-homogeneous nature of speech produced in a given situational context.

## 5.2. Practical applications

In addition to clarifying the robustness of IDK use within and across interview settings, our analysis of IDK in mental health interviews was designed as a proof-of-concept analysis to explore the translational potential of studying discourse-pragmatic variation in psychiatrist-patient interaction. Because 'research on professional-patient communication in the treatment of mental illness is in its infancy' (Hassan et al., 2007, p. 150), our analysis is intentionally focused on a feature with sufficient prior linguistic investigation. This allows for a thorough and accountable analysis, despite the admittedly modest effect of a single construction on mental health consultations.<sup>15</sup> Notwithstanding this limitation, our analysis demonstrates the clinical potential of describing site-specific patterns of language variation. If the insights described above were deemed relevant and applicable by practitioners, cross-disciplinary collaboration could translate them into awareness-raising probabilistic schemes and practical tools for in-office use (e.g., reference cards and

conversation aids). Consider, for example our qualitative characterization and quantitative account of the cognitive and resistive categories; these in particular might offer DRs learnable cues to further develop their repertoire of interactional skills (Hesson and Pichler, MS).

Focusing first on cognitive uses of IDK, the fact that a PT cannot explain or does not understand their behaviour or symptoms, as expressed by PT use of IDK in (8) above, may be therapeutically relevant to the DR's efforts towards providing consistent relief from mood disorder symptomatology for which the DR needs to have a precise understanding of the PT's daily experiences. It is therefore important that the DR probes the PT on the quantity and duration of his behaviour and symptoms to determine whether his current treatment regimen is providing adequate symptom control. Moreover, when PTs use IDK because they sincerely do not know the answer to a question, as in (9) above, further probing may challenge the PT's competence and (especially among children) may create feelings of distrust or inadequacy that are unproductive to PTs' care and damaging to the DR-PT relationship. PTs are uniquely positioned to provide information about their symptoms and anxieties. Embarrassing PTs by highlighting their lack of knowledge may amplify the interactional face-threats posed by diagnostic evaluations for mental health disorders. In turn, interactional insensitivity may stimulate non-cooperation, a situation that could adversely affect PTs' quality of care. To this end, our finding that cognitive uses of IDK are probabilistically realized as *I don't know* (rather than *I dono* or *I dunno*) might act as an important signpost for cognitive IDK interpretation.

When PTs use IDK to avoid discussion of issues that contribute to an unstable or unhealthy psychosocial environment, as in (14) above, additional exploration of these may be ultimately necessary for PTs' psychosocial care. Furthermore, the realization that a PT strategically uses IDK (and other devices) to resist the incitement to talk about therapeutic matters in an attempt to avoid diagnosis and treatment (see example (15) above) potentially provides an opportunity for the DR to move to more effective interaction formats or to explicitly address the fact that the PT may be resisting questioning (see Hutchby, 2002). Our analysis assists in these attempts by highlighting the fact that resistive uses are typically realized as *I dono* or *I dunno* (rather than *I don't know*), again offering interpretative guidance for DRs. Furthermore, our finding that the functional profile of IDK varies across adult and youth mental health PTs could be applied by DRs: with young PTs in particular, DRs might attend to the fact that IDK (along with other linguistic and non-linguistic cues) is regularly used to frustrate questions on therapeutically relevant topics.

In sum, our analysis lays the foundation for the collaborative development of guidelines for the correct interpretation of a linguistic construction previously described as therapeutically important in mental health (see Hutchby, 2002), a fundamentally interview-driven speciality (McCabe et al., 2002). Specifically, it offers: (i) a clinically relevant introduction to the multifunctionality of IDK in medical interviews; (ii) relatively objective linguistic indicators (i.e., form-function correlations) to augment DRs' native speaker intuitions and assist them with the difficult but therapeutically important task of probabilistically judging in real time which meaning a PT's IDK use signals.

## 6. Conclusion

The preceding variationist analysis of IDK in sociolinguistic and mental health interviews has enhanced discipline-specific knowledge about the nature of discourse-pragmatic variation, in particular about the effect of situational context, variety and age on IDK variability. At the same time, our extension of discourse variation analysis beyond the sociolinguistic interview has yielded findings of possible practical relevance to those regularly participating in mental health interviews: healthcare providers. Our study thus demonstrates the theoretical value and applicational potential of extending variationist analyses beyond sociolinguistic interview data.

The number of mental health condition diagnoses is increasing rapidly in the USA and UK (Collishaw et al., 2010 and Olfson et al., 2014). Unlike strictly somatic conditions, such as diabetes or cancer, there are no laboratory tests or imaging studies that aid in the diagnosis of mental health disorders. Thus, correct diagnosis and successful treatment of these conditions are crucially dependent on DRs' ability to develop effective, mutually intelligible dialogues with their PTs. Our analyses of IDK in mental health consultations has provided new insights into PTs' discursive and

linguistic practices in this speech situation. If explored further with the help of medical practitioners (and if extended to a larger and more diverse dataset; see Footnote 15), our linguistically grounded understanding of site-particular communicative practices and language variation patterns may improve diagnostic practice and therapeutic success. Analyses of sociolinguistic interviews have the potential to provide important hypotheses about the application potential of variationist research. However, truly successful impact work is crucially contingent on our commitment to analyse the very discourse produced by the anticipated beneficiaries of our research. With this in mind, we call for more variationist analyses of speech data produced in medical contexts and for closer cross-disciplinary collaboration between variationist linguists and medical practitioners.

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# Mandarin-Speaking Children's Use of the Discourse Markers Hao 'Okay' and Dui 'Right' in Peer Interaction

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**Abstract.** This study aims to investigate Mandarin-speaking children's use of two frequently appearing discourse markers – hao 'okay' and dui 'right' – when interacting with their peers in order to examine how their use of these markers may reflect their communicative skills and the characteristics of peer interaction. The data included 237 min of 5-year-old Mandarin children's conversations with their friends while playing. Schiffrin's (1987) model of discourse structures was used for the analysis.

The results showed that Mandarin-speaking children at age five have acquired several discourse functions of hao and dui. They used hao as an agreement marker and an acknowledgement marker in the exchange structure; they used dui to show their agreement in the exchange structure and to mark topic transition in the ideational structure. The children's use of the various functions of hao and dui reflected their communicative and social competence. These uses indexed their collaborative or supportive stance toward one another, which may further help them establish and maintain their relationships with their peers (Wang et al., 2010). However, the children have their limitation in using these markers. They have not developed the ability to use dui as backchannels, which has been shown to be among the last acquired communicative skills (Hess and Johnston, 1988). It is concluded that Mandarin-speaking children's use of hao and dui not only demonstrates their communicative skills but also reflects the particular nature of peer interaction.

**Keywords:** Discourse markers; Pragmatic functions; Peer relations; Mandarin children.

## 1. Introduction

### 1.1. Hao and dui as discourse markers in Mandarin

Discourse markers have been widely investigated by many researchers in the past decades (Fraser, 1990, Halliday, 1994 and Schiffrin, 1987). Schiffrin (1987) defined discourse markers as “linguistic, paralinguistic, or non-verbal elements that signal relations between units of talk by virtue of their syntactic and semantic properties and by virtue of their sequential relations as initial or terminal brackets demarcating discourse units” (p. 40). Fraser (1990) specified the characteristics of discourse markers as those that “impose a relationship between some aspect of the discourse segment they are part of...and some aspect of a prior discourse segment...” (p. 938). Discourse markers are linguistic devices used by speakers to make the relations between the previous and the ongoing texts salient in order to build the coherence of discourse units.

A growing body of research on Mandarin discourse markers has discussed the functions of various discourse markers. Some of these studies focused on two frequently used discourse markers, hao 'okay' and dui 'right', in conversations (Chui, 2002 and Lu, 1980/2004; Lu, 2006; Miracle, 1991, Tsai, 2001, Wang and Tsai, 2005, Wang et al., 2010, Xian, 2007 and Yu, 2004). These studies suggested that hao in Mandarin expresses different moods, and it is a marker of agreement, conclusion, and counter-expectation that resembles an interjection (Lu, 1980/2004); it also marks three types of relations: (1) the development and closure of social and physical actions, (2) the speaker's assertion of a previous utterance, and (3) the transition to a new topic or social activity

(Miracle, 1991). Wang and Tsai (2005) further investigated the meanings of hao in spoken Mandarin discourse by adapting Halliday's (1994) three-dimension model, which is comprised of the ideational level, the textual level, and the interactional level. Their results revealed that at the ideational level, hao can be an adjective meaning 'good, fine, nice, okay, all right, yes' or a degree adverb similar to 'very' in English. At the interactional level, hao functions as an agreement/acceptance marker, and it signals the speaker's positive evaluation of the previous interactional move. Depending on the nature of the previous move, hao can mark an agreement, compliance, acceptance, or concession. Sometimes it can be used to acknowledge that it is the speaker's obligation to take the present turn in order to release the other interlocutor from the responsibility to continue his/her turn.

The occurrence of hao in discourse also indicates the speaker's intention to end the present exchange and start a new one. Wang and Tsai (2005) found contextual differences in the various meanings of hao. In radio interviews, hao was used more frequently by the host as a (pre-)closure/transition marker to signal the end of a talk. In daily conversations, it was used more constantly as a marker to convey the speaker's agreement and as a concession marker to negotiate the closure of the current topic.

Among the studies of dui, Chui (2002) discussed the ritualization process of dui, developing from a verb to a discourse particle in spoken Mandarin. She argued that through conventionalized routines, dui has gained pragmatic functions to indicate agreement or strengthen the truthfulness of the proposition conveyed. Tsai (2001) and Yu (2004) both focused on the functions of dui in spoken discourse. They suggested that dui serves various functions in conversations. In addition to the affirmative meaning, dui has pragmatic meanings. Dui also indicates the speaker's agreement, acknowledgement, and confirmation, and functions as a device for textual organization. Moreover, dui serves as reaction tokens or backchannels to express the speaker's attention and interest in the current conversation. According to Clancy et al.'s (1996) categorization of reactive tokens, these expressions are the "short non-floor-taking words or phrases" (p. 359) a non-primary speaker utters during the interaction. Typical reactive expressions are assessments, such as zheyang hao 'such PRT' 1 and dui 'right' in Mandarin.

Wang et al. (2010) compared the discourse-pragmatic functions of hao and dui and found similarities and differences between the two discourse markers. Both hao and dui function at the textual level and the exchange level of discourse. At the textual level, hao is a boundary marker of closure or transition, while dui functions as a continuity marker. Hao at the textual level marks the closure of a current topic or the transition between discourse topics. Dui, as a continuity marker at the textual level, usually appears in the speaker's own turn to affirm and strengthen the truthfulness of his/her subjective beliefs and to imply discourse continuity.

On the other hand, at the exchange level, hao is a marker of agreement and acceptance; dui signals agreement or acknowledgement. Both markers function as evaluative responses at the exchange level. Hao serves as a positive response to requests, suggestions, plans, and proposals to agree with the previous speaker's act or move. Dui confirms the truthfulness of the previous speaker's assessment or information and as a result indicates the speakers' agreement; it also signals not only the perception and understanding of the shared information but also the shared orientation toward it. This function of dui is similar to that of 'right' in English (Watts, 1989). When dui forms a single turn, it acknowledges the speaker's right to continue his/her current turn. In this case, dui serves a function very similar to other short verbal responses such as backchannels. When hao and dui combine with different particles, such as a, ya, le, and la, they convey a wider range of interactional functions (Biq, 2004). Generally speaking, both dui and hao are used by Mandarin speakers to show their involvement in the current interaction. Wang et al. (2010) therefore claimed that hao and dui in spoken Mandarin are used by the speaker to negotiate with the hearer a consensus on the propositional contents and the relevance of utterances at the textual level, and to establish alignment and coherence of discourse at the interpersonal level.

## 1.2. Mandarin-speaking children's acquisition of hao and dui

Previous studies have suggested that hao and dui in Mandarin function as discourse markers and can be used to build an alignment between speakers. While a large and growing body of literature has

investigated the discourse functions of hao and dui, fewer studies have discussed Mandarin-speaking children's acquisition of these markers. Huang (2000) conducted a developmental study on Mandarin children's acquisition of the discourse marker hao by using Shiffrin's (1987) discourse model. He investigated casual conversations between adults and peers with 60 Mandarin-speaking children aged three to five years old. His results suggested a developmental process of the children's use of hao as a discourse marker. As the children grew older, they acquired the ability to use hao in different discourse structures and were able to use more functions of hao compared with the younger children. The three-year-old children used hao mostly in the exchange structure and the action structure, to acknowledge assertions in request-compliance pairs in the exchange structure and to mark closures of physical actions and other people's complaints in the action structure. At around age four, the children started to use hao to mark the completion of deliberation in the information state. This usage demonstrated the children's ability to organize and manage their information states (cognitive states).

Moreover, the 4- and 5-year-old children had the ability to manipulate hao as a turn-grabbing marker in the exchange structure, using hao in the exchange structure to grab the turns of other interlocutors. Furthermore, at age four and five the children used hao to initiate elaboration questions in the information state. Finally, the five year olds showed an ability to manipulate two more functions of hao in the ideational structure, using hao as a transition marker to signal topic shifting and the linking of two phases. In general, the three and four year olds used hao mostly at the local level (i.e., to mark closures of actions in the action structure and to grab turns in the exchange structure), while the five year olds showed an ability to use it at the global level (i.e., to shift topics in the ideational structure).

### 1.3. Children's use of discourse markers as register variables

Earlier studies have revealed that children at a very young age have the ability to use linguistic devices as register variables when interacting with other people (Andersen, 1990, Andersen, 1996, Andersen et al., 1999, Kyratzis, 2005 and Kyratzis and Ervin-Tripp, 1999). Some of these studies focused on children's use of discourse markers. Their findings suggested that children's choices and uses of discourse markers reflect their register knowledge of social relationships, as well as the level of familiarity and intimacy, between interlocutors, and also the topic and settings of discourse (Ellis and Ure, 1969).

Andersen et al. (1999) conducted a cross-linguistic study on children's early acquisition of using discourse markers as register variables in pretend play. They compared the previous findings from 4- to 7-year-old children who spoke American English, Lyonnais French (Andersen, 1990 and Andersen, 1996), and Chicano Spanish and found not only developmental differences but also asymmetrical uses of these markers when the children were involved in pretend play. As the children grew older, they used more discourse markers in their role playing. In addition, the children who acted in higher status roles used certain discourse markers that were rarely found in the production of children acting in lower status roles. By age six, the English-speaking children had acquired a fair number of discourse markers and understood how to use them to convey status asymmetry depending on the various roles and situations. This finding demonstrates that the children's use of discourse markers reflected their recognition of social relations to one another. Moreover, the children used discourse markers to convey social meanings and to manipulate social power relations before such relations were established.

Kyratzis (2005) investigated how English children used 'because' as a marker of collaborative stance in peer interaction. Her findings showed that English children as young as four years old use 'because' in the participation framework as a marker of solidarity and collaboration to validate justifications to support their partner's proposal. These studies revealed that children are aware of their social relations with their interlocutors and that they are able to use various linguistic devices at hand to mark such differences.

### 1.4. The role of peers in children's development

Scholars have also emphasized the importance of peers in children's development (Bandura and Walters, 1963, Mead, 1934, Piaget, 1932 and Sullivan, 1953). They believed that parents are not alone in playing a crucial role in children's development; significant others, such as siblings,

out-of-home caregivers, and peers, are all influential to children's development. These significant others help children develop their social skills, language abilities, and social cognition. In particular, peer interactions provide a suitable and valuable context for children's adaptive development. Without the experience of normal peer interactions, children may easily go through maladaptive development (Rubin et al., 1999).

Through interacting with peers, children gain opportunities in experiencing conflicts, negotiating, and discussing various perspectives, thereby developing the ability to understand other people's thoughts, emotions, and intentions (Doise and Mugny, 1984, Piaget, 1932 and Selman and Schultz, 1990). Piaget (1932) emphasized the importance of peer interactions in children's development. He suggested that children's relations with peers can be distinguished from those with adults, in either form or function. Children's relationships with parents or other adults are asymmetrical and complementary. This kind of relation falls along a vertical plane of power assertion and dominance. Children normally accept adults' rules for obedience instead of completely understanding such rules. On the contrary, peer relations are more symmetrical and balanced, falling along a more horizontal plane of dominance and power assertion. It is, Piaget claimed, the experiences of interacting with peers that provide children the opportunities to examine conflicting ideas and to develop the ability to negotiate and discuss various perspectives. Not until children understand how to negotiate with others can they decide whether to compromise with or reject others' suggestions.

It is believed that one of the best and most effective ways for children to solve conflicts with peers is through the cooperative exchange of questions, explanations, and reasoned conversations (Rogoff, 1990). Therefore, these interactions with peers may result in good outcomes in the positive and adaptive development of children in many aspects, such as the ability to understand others' thoughts, emotions, and intentions (Doise and Mugny, 1984 and Selman and Schultz, 1990). With a social understanding of other people's minds, children are believed to be able to consider the consequences of their own or others' social behaviors both for themselves and for other people. This ability then results in their production of socially appropriate behaviors (Dodge and Feldman, 1990).

Moreover, with a perspective-taking ability, children establish an organized self system comparative to others (Mead, 1934). Earlier researchers have also claimed that peers are appropriate social models for children's personality shaping (Sullivan, 1953) and behavior shaping (Bandura and Walters, 1963). Sullivan (1953) believed that children's interactions with peers help them develop "the concept of mutual respect, equality and reciprocity" (as cited in Rubin et al., 1999, p. 454). He emphasized the significance of "special relationships," such as friendship, in developing these concepts. When these concepts of mutuality become central to children's close friendships, they start to acquire a more complex understanding of social relationships. Sullivan suggested that as children grow up, peers become more and more important in children's personality shaping. Peers also have a significant influence on children's awareness of the construction of social roles, such as dominance, deference, competition, and cooperation. In turn, this understanding of friendships has noteworthy impacts on other relationships. Bandura and Walters (1963) proposed another theory known as the social learning theory, which has been influential to many current studies on peer interaction. In their social learning theory, it is through being directly taught or indirectly observing their peers' social behaviors that children learn about the social world around them and how to behave appropriately in such a social context. Peers become behavior shaping and controlling agents to each other, and these social behaviors in turn help children to maintain, establish, or disrupt their relations with peers.

### 1.5. The present study

Previous studies have investigated the various functions of discourse markers in Mandarin; nevertheless, little research has focused on Mandarin-speaking children's use of multifunctional discourse markers or has discussed how Mandarin-speaking children use them as register variables. The present study thus investigated how Mandarin-speaking children use the two frequently appearing discourse markers—hao 'okay' and dui 'right'—when they interact with peers in order to examine their communicative skills and, moreover, to see whether these uses reflect the characteristics of peer relations.

Among the current alternative frameworks concerning discourse structures (e.g. Halliday, 1994 and Schiffrin, 1987), the present study adopted Schiffrin's (1987) discourse model as the analytical framework. Previous studies suggested that children acquire local relations of propositions earlier than their global organizations (Bamberg and Marchman, 1990 and Su, 1999). We therefore considered a discourse model such as Schiffrin's, which focuses more on a local level of relations, would be suitable for analyzing children's use of discourse markers. In addition, Schiffrin's model could also be extended to take account for more global relations of discourse units (Schiffrin, 1987, p. 24) if needed.

Moreover, there were relatively few studies that focused on Mandarin-speaking children's use of discourse markers. One of them was Huang's (2000) study on Mandarin-speaking children's acquisition of the discourse marker *hao* by using Schiffrin's framework. Adopting Schiffrin's model for analyzing the Mandarin-speaking children's use of the markers *hao* and *dui* in the present study also facilitated the comparison of the current results to those of Huang's (2000).

## 2. Methods

### 2.1. Participants and data

The participants in the present study were six 5-year-old Mandarin-speaking children, including three girls and three boys. All of these children lived in the northern part of Taiwan and studied in the same kindergarten. Their mother tongue was Mandarin, which was also the major language they used both at home and in kindergarten. They were in the same class and were all acquainted friends. The data were collected in the morning sessions at the kindergarten three times a week in May and June 2011. Two participants at a time were taken into the playroom. Their interactions were video recorded using a digital camcorder. The researcher as an observer seldom participated in the children's interactions, while the other children outside the playroom occasionally joined in their conversations. The data used in this study consisted of 237 min (10 sessions) of natural conversations between these participants. Each session was recorded for 13–30 min depending on the smoothness of the children's interactions. All of the dyads were involved in similar activities, such as playing with blocks and toys. The collected data were then transcribed according to the CHAT convention and analyzed by the CLAN program (MacWhinney, 2000).

### 2.2. Analytical framework

The discourse structure in which each occurrence of *hao* and *dui* was located was coded. Based on previous research, Schiffrin's (1987) model of discourse<sup>2</sup> was adopted as the analytical framework in the present study. The discourse structures in our framework included: (1) the exchange structure, which consists of “the outcome of the decision procedures by which speakers alternate sequential roles and define those alternations in relation to each other” (Schiffrin, 1987, p. 24), and is also where adjacency pairs, such as question–answer or greeting–greeting, are established; (2) the action structure, where speech acts are situated; (3) the ideational structure, which involves the organization of ideas within the discourse; and (4) the information state, which is related to the organization and management of both the speaker and hearer's knowledge and meta-knowledge. If *hao* or *dui* was used in more than one discourse structure, all of the discourse structures were coded.

In addition to discourse structures, the discourse functions of *hao* and *dui* within the discourse structures were also identified. Based on previous studies (Chen and Liu, 2009; Chui, 2002; Huang, 2000; Miracle, 1991; Tsai, 2004; Wang, 2005), *hao* and *dui* were analyzed in terms of the following functions in the current study: *hao* may serve as an agreement/acceptance marker or an acknowledgement marker in the exchange structure; as a marker of assertives or directives in the action structure; as a topic transition marker in the ideational structure; or as a marker of completion of deliberation in the information state. As for *dui*, the marker may serve as an agreement marker or an acknowledgement marker in the exchange structure, or as a marker of the closure of the previous topic and the start of an unrelated topic in the ideational structure.

### 3. Results

#### 3.1. The distribution of hao and dui in different structures of discourse

A total of 155 tokens of hao were found in the present data. The average frequency of hao was 0.65 per minute of the total 237 min of the children's peer conversations. In this study, the discourse structure in which each occurrence of hao was located was identified. All of the discourse structures were coded if hao appeared in more than one discourse structure simultaneously. Table 1 demonstrates the distribution of hao for discourse structures in the Mandarin-speaking children's conversation with peers.

In the current data, 319 uses of hao were identified in the children's interactions with peers. The most frequent use of hao was in the information state (48.59%); the second most frequent was in the exchange structure (32.92%); and the third most frequent was in the action structure (18.50%). The use of hao in the ideational structure was not found in the current data. The reason that the information state uses had the highest frequency of all could be seen more clearly in the following analysis; that is, such uses always co-occurred with the uses in other discourse structures.

The most frequent uses of hao in the children's peer conversation were those in the information state. Excerpt 1 illustrates the children's use of hao in the information state. In this excerpt, LIN used hao to indicate her receipt of and her positive evaluation toward the information given by NIN. This use demonstrated the interactions between the speaker's and the hearer's cognitive states.

The second frequent uses of hao in current data were the exchange structure usages. Excerpt 2 is an example of such use of hao. In this example, LIN used hao as a positive response to CAI's request. The two adjacent utterances formed a request–response pair in the exchange structure.

Hao in the children's data also functioned in the action structure as seen in Excerpt 3. NIN in the example used hao to mark his assertion that it was his turn to knock down the plastic trees. Such use of hao to signal a speech act of assertion therefore functioned in the action structure.

Moreover, in our data, all of the 155 tokens of hao were found to appear in more than one discourse structure at the same time. Table 2 illustrates the distribution of the multifunctional marker hao. The result showed that the children's uses of hao functioned simultaneously in three discourse structures, including the action structure, the exchange structure, and the information state.

As seen in Table 2, all of the information state usages of hao co-occurred with uses in other structures (i.e., the action structure and the exchange structure). In addition, such uses of hao barely appeared alone. This may result from the fact that the function of hao in the information state involves the interaction between the interlocutors' knowledge, and such interaction was in every conversational move the interlocutors made. Excerpt 4 is an example of hao in the information state and the exchange structure.

In this example, JUN said hao to show his perception and positive assessment of the information NIN provided. This hao functioned in the information state since it is related to the interaction between JUN and NIN's knowledge and meta-knowledge about the color of the toy car. It also functioned in the exchange structure showing JUN's acknowledgement of NIN's statement. This use of hao thus helped the two speakers achieve shared information in the information state, while indicating the speaker's perception and positive evaluation toward the previous move in the exchange structure.

More interestingly, there were nine uses of hao serving in three structures—the action structure, the exchange structure, and the information state—at the same time. Excerpt 5 is an example of this use.

In Excerpt 5, JUN claimed that he could break into the toy house. ZHI acknowledged JUN's statement by using hao and further permitted JUN to break in. In this example, hao functioned in the information state indicating the transmission of the information from one speaker to the other, and in the exchange structure acknowledging the speaker ZHI's perception of the information. It also functioned in the action structure as a declaration of the directive *ni chuang a* 'break in'. ZHI's use of hao served to declare a permission for JUN to break in. After ZHI's utterance, JUN jumped cross the block wall into the toy house and asked ZHI if it was impressive. JUN's subsequent action and



utterance further indicated the information exchange between the two speakers and also JUN's perception of ZHI's response as a permission to break in.

Similarly, the Mandarin-speaking children used discourse marker *dui* in different discourse structures when they interacted with peers. A total of 64 tokens of *dui* were found in the present data. The average frequency of *dui* was 0.27 per minute among the total 237 min of the children's peer conversations. The discourse structure in which each occurrence of *dui* was located was identified. All of the discourse structures were coded if *dui* appeared in more than one discourse structure simultaneously. Table 3 demonstrates the distribution of *dui* in the discourse structures in the peer conversations.

As seen in Table 3, there were a total of 128 uses of *dui*. The most frequent use of *dui* was in the information state (50%), followed by the uses in the exchange structure (43.75%) and the ideational structure (6.25%). The use of *dui* in the action structure was not found in the data. The reason *dui* in the information state accounted for half of the total uses was that such uses always co-occurred with uses in other structures, which can be seen more clearly in the following analysis.

The Mandarin-speaking children in the data used *dui* mostly in the information state, which were related to information exchanges between the speaker and the listener. Excerpt 6 illustrates the children's use of *dui* in the information state. In the excerpt, JUN wondered whether it was nighttime in the United States while they were talking. NIN used *dui* to confirm the truthfulness of JUN's information.

The second frequent uses of *dui* were those in the exchange structure, where adjacency pairs and conversational exchanges are located. Excerpt 7 is an example of such use in the children's peer interactions. LIN used *dui* as an answer to NIN's question about the roads they built with blocks. Their two utterances formed a question–answer pair in the exchange structure.

*Dui* was also found in the ideational structure in the children's uses. *Dui* in this structure signals the relations and the organization between ideas. Excerpt 8 is an example of *dui* in the ideational structure. CAI used *dui* to link his previous topic, building the house, to his following topic, which was playing the xylophone. *Dui* was used to signal the relations between topics and also made the discourse cohesive.

Among the uses of *dui*, all of the 64 tokens appeared in more than one discourse structure at the same time. Table 4 shows the distribution of *dui* in multiple discourse structures. This multifunctional marker *dui* occurred in the information state, the exchange structure, and the ideational structure.

As seen in Table 4, the use of *dui* in the information state co-occurred with the uses in the exchange structure or the ideational structure. In addition, it shows that all of the information state usages of *dui* functioned simultaneously in another structure. This may be related to the function of *dui* in the information state, which involves the interaction between the interlocutors' knowledge and meta-knowledge. Excerpt 9 illustrates how the children used *dui* in the information state and the exchange structure.

Before this conversation, JUN threw the carrot to NIN who wanted to hit it with the shovel but failed. JUN stated the fact that NIN did not hit the carrot at the beginning of the example. NIN said *dui* to confirm the truthfulness of JUN's information that he failed to hit it. He further repeated JUN's utterance *mei da dao* 'did not hit (it)' to restate the fact, therefore explicitly presenting the now-shared information. This use of *dui* functioned in the information state as a device to confirm and to establish the speakers' shared knowledge, while in the exchange structure it functioned as an acknowledgment of the previous utterance. In the information state, NIN's use of *dui* confirmed the shared information and added this information to both his and JUN's knowledge states. In the exchange structure, by uttering *dui*, NIN changed his role from the hearer to the speaker and marked his utterance as an acknowledgment to JUN's statement. After saying *dui mei da dao* 'Right, (I) didn't hit (it)', NIN then picked up the carrot and threw it far away from JUN as a nonverbal response to his failure.

These results show that the children used both discourse markers *hao* and *dui* when talking to peers, though they used *hao* more frequently than *dui*. Both markers were found in various discourse structures. The children used *hao* in three discourse structures, which were the information state, the exchange structure, and the action structure. They also used *dui* in three discourse structures, which

were the exchange structure, the ideational structure, and the information state. The children's uses of hao and dui were also found in more than one discourse structure simultaneously. To be specific, the information state usage of hao and dui co-appeared with the uses in other discourse structures. Moreover, all of the children's uses of the two markers in the information state functioned in another discourse structure at the same time.

### 3.2. Functions of hao and dui in the children's peer interactions

The results show that the Mandarin-speaking children used hao and dui in various discourse structures for different discourse functions. Hao functioned as an agreement/acceptance marker and an acknowledgement marker in the exchange structure; as a marker of assertives or directives and a marker of closure/completion in the action structure; and as a marker of the interaction between the interlocutors' knowledge and meta-knowledge in the information state. Dui in the current data also served various functions, namely, as an agreement marker in the exchange structure; as a topic transition marker in the ideational structure; and as a marker of the interaction between the interlocutors' knowledge and meta-knowledge in the information state. Table 5 summarizes the functions of the children's use of hao and dui in different discourse structures.

As mentioned above, the uses of hao and dui in the information state involved the interaction between the interlocutors' knowledge and meta-knowledge and were related to all of the other discourse functions of the two markers. In-depth analysis therefore will focus on the functions of hao and dui in the exchange structure, the action structure, and the ideational structure in the following sections. In addition, how these functions reflected the children's social recognition will also be illustrated.

#### 3.2.1. Hao as an agreement/acceptance marker

One of the discourse functions of hao in the current data was its use as a marker of agreement/acceptance of others' suggestions and requests in the exchange structure. Excerpt 10 is an example of how these children used hao to show their agreement with others.

In the example, LIN and NIN were discussing how to build a house. NIN suggested that they use the blocks in the back of the playroom. LIN soon expressed her agreement by answering hao 'okay'. Thus, LIN used hao as an agreement marker to show her positive evaluation and supportive attitude toward NIN's suggestion. It also demonstrated the children's intention to collaborate and may further help them maintain their relations as peers.

The children also used hao to form an A-not-A question to ask for the hearer's evaluation, opinions or permission as seen in the example above. NIN used hao-bu-hao at the end of his utterance to seek for his friend's opinion about his choice on the materials for their toy house, therefore indicating his concern about the friend's thought. NIN's tag question hao-bu-hao and JUN's answer hao formed an adjacency pair in the children's conversation. In this question-answer pair, hao was a preferred second pair part, which expressed the speaker's positive evaluation toward the previous proposition. The use of hao-bu-hao to ask for other people's opinion and the preferred positive response hao may help the children construct the alignment between peers more easily.

This result may also imply that the Mandarin-speaking children at age five have acquired the ability to pay attention to other people's thoughts and feelings, and to consider other people's opinions. Through the interactions with peers, the children could have more opportunities to examine their ideas, and to negotiate with others from various perspectives (Piaget, 1932 and Rogoff, 1990). This perspective-taking ability, as previous researcher claimed, would be acquired in children's interactions with peers (Sullivan, 1953).

When hao functioned as a marker of agreement, the children sometimes combined it with the particle la. Excerpt 11 demonstrates JUN's use of hao with the particle la to signal his reluctant agreement with his friend. In the example, JUN found some blocks and claimed that they were money. CAI requested that JUN give him some money. JUN agreed with hao la.

Mandarin-speaking five year olds sometimes use hao, na... 'okay, in that case...' to negotiate their rights or thoughts with their peers. Specifically, they use hao to agree with some aspects of the other's suggestions or requests and na 'in that case' to mark the conditions of the agreement. Excerpt 12 illustrates the children's usage of hao, na... 'okay, in that case...' for negotiating with peers.

XIn this example, JUN and ZHI argued about who could take the toy phone. JUN justified his statement by explaining his need to contact ZHI through the phone. ZHI approved of JUN's keeping the phone with a condition that she would call JUN as well. ZHI used hao, na... to mark the conditional agreement and to express her compromise with JUN.

### 3.2.2. Hao as an acknowledgement marker

Another function of hao in the Mandarin-speaking children's peer interactions was its use as an acknowledgment marker in the exchange structure. Excerpt 13 is an example of how the children used hao to acknowledge others' assertions.

In this example, CAI found a set of ready-built toy railway tracks on the shelf and was very excited. He immediately showed those tracks to LIN. LIN said hao to acknowledge her receipt of this information, and to show that she was participating in the interaction. Excerpt 14 gives another example of how the children used hao to signal the receipt of information and participation.

In excerpt 14, after JUN announced that he was going out, ZHI acknowledged her receipt of the announcement by answering hao. Instead of just expressing acknowledgement, ZHI further said good-bye to imply her approval of JUN's leaving.

### 3.2.3. Hao as a marker of assertives, directives, or completion

Hao in the children's peer conversations functioned as a marker of assertives or directives, and as a marker of action completion in the action structure. Excerpt 15 illustrates how the children used hao as a declaration marker to initiate directives when talking to peers. In the excerpt, NIN used hao to capture JUN's attention and express his attempt to throw the blocks again.

Hao also functioned as a declaration marker of assertives in the children's peer conversations. Excerpt 16 demonstrates the children's use of hao to declare an assertive. In this example, NIN used hao to capture CAI's attention and to initiate his assertion zheyici kan wo de 'this time (you) watch me do it' to announce that it was his turn to play.

In addition, the children used hao as a marker of the closure or completion of physical actions. Excerpt 17 is an example of the children's use of hao as a declaration of action completion. As seen in the excerpt, JUN asked CAI to wait for him because he had not finished building the castle. As soon as he finished making the castle, he declared the completion of his action with hao. The function of hao as a completion marker is clearly seen in this excerpt because there is a contrast in JUN's utterances. He first pointed out that the action was not finished, and in his next utterance, he used hao to announce and mark the ending point of this action.

Even though the discourse marker hao could be used alone to declare the completion of actions, in the present data when the children used hao as a declaration of completion, they tended to use it with the particle le, as shown above in Excerpt 17. According to previous researchers, the particle le in Mandarin marks a "change of states" (Chu, 1999, p. 96) or a "currently relevant state" (Li and Thompson, 1981, p. 240), which has a compatible function with that of hao as a completion marker. Biq (2004) suggested that hao le as an independent intonation unit marks the transition boundaries of topics.

Excerpt 18 is another example of the combination of hao with le in the current data. In this excerpt, JUN volunteered to help ZHI with the blocks. He claimed that he could build with them. When he did it, instead of using hao, he said hao le to mark the completion of his action and to highlight the change of states.

In sum, in the current data the children used hao as a declaration to mark directives, assertives, and the completion of physical actions in the action structure when interacting with their peers. In addition, when declaring the completion of a physical action, most of the time they combined hao with the discourse particle le to further indicate a "change of states" (Chu, 1999, p. 96).

### 3.2.4. Dui as an agreement marker

One of the discourse functions of the children's use of dui was to show their agreement in the exchange structure. Excerpt 19 is an example of such usage.

In the example, NIN and CAI were playing with toy cars. NIN claimed that it was very interesting. He asked CAI if he felt the same by using the tag question dui-bu-dui. CAI agreed with NIN's

statement by answering *dui*. *Dui* therefore signaled CAI's agreement by verifying the information NIN provided.

Besides prior propositions, the children also used *dui* to agree with their peer's previous nonverbal move, as illustrated in Excerpt 20.

In this excerpt, JUN used *dui* to show his positive assessment toward CAI's action of setting up the plastic door. He explicitly spoke out about CAI's action, which he agreed with, by saying *fang zhebian* 'put (it) here' in his next turn.

Furthermore, the children were capable of using the agreement marker *dui* with discourse particles to express additional interactional functions when interacting with peers. Excerpt 21 demonstrates the children's use of *dui* with the particle *a* to indicate their involvement in the current topic.

As seen in the example, JUN asked NIN if he was playing on a swing. NIN answered *dui a* to express not only his agreement but also his involvement in the topic. NIN further elaborated the topic by adding his comment that they could play on the toy swing if they shrank themselves.

The children also used *dui* to form an A-not-A tag question as seen in the above excerpts 19 and 21. They used the tag question *dui-bu-dui* to confirm the truthfulness of the given information with their addressee. In excerpt 19, NIN used *dui-bu-dui* to ask CAI about the truthfulness of his evaluation that the game they were playing was interesting. Similarly in excerpt 21, NIN used this tag question to seek for JUN's confirmation of his statement that if they shrank themselves, they would be able to play on the toy swing. The children's use of *dui-bu-dui* to confirm the truthfulness of their own evaluation with their addressees demonstrated their ability to consider other people's opinions, which may have further helped them construct their relationships with peers. The tag question *dui-bu-dui* and the preferred response *dui* formed an adjacency pair, indicating the children's intention and their co-construction of their alignment.

### 3.2.5. *Dui* as a topic transition marker

Another function of *dui* in the children's usage was to serve as a topic transition marker in the ideational structure. Excerpt 22 gives an example of such usage.

In this example, ZHI and JUN were playing in a toy house built of blocks. They pretended that they were having some guests visit their toy house the next day, but JUN accidentally kicked some blocks and made a mess. ZHI blamed JUN for messing up. After ZHI's accusation, JUN uttered *o dui* 'oh, right' to change the current topic, meanwhile he left the toy house and reached to the toy car. He skillfully used *dui* to create an exit from the current unpleasant topic and started an unrelated one before he left, in that he was going to buy a watch and a phone.

When *dui* appeared as a marker of topic transition in the ideational structure, the children usually used it with the discourse particle *le*. Excerpt 23 demonstrates how the five year olds used *dui le* to mark topic shifts.

In the excerpt, the children were playing with some blocks and using them to build several roads. CAI used *dui le* to interrupt the ongoing topic, which was related to the roads they were building, and to set up a new topic about the toy cars they were going to use.

## 4. Discussion

As discussed in the previous sections, the Mandarin-speaking children at age five demonstrated an ability to use the discourse markers *hao* and *dui* in multiple discourse structures. These uses of *hao* and *dui* served various discourse functions. Interestingly, all of the information state uses of both *hao* and *dui* co-occurred in another discourse structure. This use of *hao* and *dui* in the information state involved the interaction of the speaker and hearer's knowledge and meta-knowledge. This was related to the original meaning of the two markers as stative verbs; that is, *hao* to show the speaker's positive evaluation of the information provided and *dui* to confirm the truthfulness of the information. Other discourse functions of the two markers such as those in the exchange structure, the action structure, and the ideational structure were derived from this original meaning through the grammaticalization process (Chen and Liu, 2009 and Chui, 2002; Miracle, 1989; Tsai, 2001; Wang, 2005; Yu, 2004). The derivation therefore explains why *hao* and *dui* can function in the information state and other

discourse structures simultaneously. The findings on the children's communicative abilities and the characteristics of peer relations will be further discussed in the following sections.

#### 4.1. Hao and dui as an agreement marker

The Mandarin-speaking children in the study used both hao and dui as an agreement marker in the exchange structure to build an alignment with their peers. They used hao to show their positive evaluation of and supportive attitude toward the previous proposition and dui to confirm the truthfulness of their peers' assessment or information, and therefore to express their agreement. These uses indicated the children's intention to collaborate. Such uses may increase the intimacy between the children and may further help them establish alliances and maintain their relations with peers. Agreements demonstrate the speaker's supportive attitude toward the other interlocutor, thereby meeting the other's face needs (Brown and Levinson, 1987). In other words, the agreement markers hao and dui function as face-preserving devices to express positive politeness (Brown and Levinson, 1987) or shared understanding (Holmes, 1986).

Hao and dui in the exchange structure appeared as second pair parts and the responses in an adjacency pair. A second pair part demonstrates the speaker's interpretation of the previous turn. Hao and dui as second pair parts showing agreement with the other speaker may indicate an alignment between interlocutors (Wang et al., 2010). The children's use of the agreement markers hao and dui, which demonstrated the speaker's collaborative stances, may thus help them establish alignments with their peers and further strengthen their peer relationships. The children's use of the two agreement markers also indicated their intention to cooperate with each other to be polite, which fulfilled Leech's (1983) "Agreement Maxim" in the Politeness Principle that "minimize disagreement between self and other; maximize agreement between self and other" (p. 132).

Although the children used both hao and dui as an agreement marker in their conversations, the two markers indicated different aspects of an agreement. Hao demonstrated the children's positive evaluation of and their supportive attitude toward his/her peer's previous interactional move. It served as a positive response to requests, suggestions, plans, and proposals to agree with their peer's act or move (Wang et al., 2010). Depending on the nature of the previous move, hao can mark an agreement, compliance, acceptance, or concession (Wang and Tsai, 2005). On the other hand, dui was used by the children to confirm or strengthen the truthfulness of their peer's assessment or information and as a result indicated their agreement; it also signaled not only the perception and understanding of the shared information but also the shared orientation toward it (Chui, 2002 and Wang et al., 2010).

Sometimes the children combined the agreement markers hao and dui with particles to express a wider range of interactional functions (Biq, 2004). They used hao la to indicate a reluctance to agree, which showed the speaker's intention to align with his/her peer even though he/she was against the idea. The children specified their agreement and their intention to align with their peers by answering hao; they also marked the agreement as a reluctant one by adding the particle la to maintain their own face, which may further reinforce their intention to maintain the alignment and thus increase solidarity with their peers.

The children also used dui a (or ya/wa) 4 (Chu, 1999 and Wang et al., 2010) to imply their personal involvement and concern with their interlocutor and the current topic. Chu (1999) considered the particle a in Mandarin as a kind of "personal-involvement particle" (p. 105) that indicates the speaker's personal concern for the other speaker or the topic of the current talk. It adds no new information to the propositional content but only serves the pragmatic function of showing the speaker's intention to participate in the present topic. Through expressing their personal concern by using the involvement particle a along with the agreement marker dui, the children enhanced their supportive stance and involvement in their conversations with peers, which may help them build an alignment and maintain their peer relations.

In addition to fully agreeing with their peers, the children also knew how to maintain equality in their peer relations by using hao, na... 'okay, in that case...' to express conditional agreement or a compromise, or to negotiate their rights with peers. They used the agreement marker hao first to show their cooperative stance, and then used na 'in that case' to start the negotiation with their peer. This

indicates that Mandarin-speaking children at the age of five are aware of the importance of maintaining harmonious relations with others.

Most of the time, disagreements are a face-threatening act. Speakers, to be polite, tend to minimize their disagreement in various ways, such as expressing it indirectly with partial agreements (Wang et al., 2010). The children therefore used hao, na... to express partial agreements or compromises instead of refusing the proposal directly. This use demonstrated the children's pragmatic competence of politeness by saying hao to partially agree with the other's proposal in order to facilitate negotiation. It also implied that Mandarin-speaking children at age five might have developed the idea of being polite, to some degree, by aligning themselves with their interlocutors before expressing their disagreement. The children's use of hao, na... 'okay, in that case...', which showed their conditional agreement, indicated their intention to cooperate and, on the other hand, may help to maintain an equal status between themselves and their peers. Such use showed the children's conversational skills and may also reflect the characteristics of peer relations that the two interlocutors were of equal status.

The above-mentioned functions of hao and dui in the children's peer conversations illustrated how the children forged an alliance with their peers by showing their collaborative stances, and how they intended not only to maintain their relationships with peers but also to ensure that they were equal.

#### 4.2. Hao as an acknowledgement marker

The 5-year-old Mandarin-speaking children's use of hao as an acknowledgement marker to show the receipt of information resonated with Huang's (2000) findings. The children used hao to move out of a recipient role and project further speaking. Their use of hao as an acknowledgement marker indicated that the children were responsive and sympathetic, and that they were participating in the interaction. It also demonstrated the children's intention to participate in their interlocutor's current talk and to make the conversation go smoothly. By showing their involvement and interest in their peer's conversation, the children maintained their relations with peers more efficiently.

According to earlier research, acknowledgement markers are one of the devices speakers use to express their involvement in an ongoing conversation (Biq, 1998, Chen and Liu, 2009, Sacks et al., 1974 and Wang et al., 2010). These markers also indicate the speaker's agreement with an implied plan carried by prior utterances (Fellegly, 1995, Sacks et al., 1974 and Schegloff, 1984). The use of the acknowledgement markers thus helps the speaker to establish or maintain social relations. Any violation or delayed delivery of such responses signals the avoidance of further participation in a conversation (Fishman, 1983), lack of interest, indifference and impatience (Stenstrom, 1994), or the speaker's refusal to take part in the possible development of the current topic (Fellegly, 1995 and Henley and Kramarae, 1991). Such a violation would cause damage to the interlocutors' relationship.

When interacting with their peers, the 5-year-old children in the current study used hao to signal their participation in the conversation to help them forge an alignment with their peers, which further reinforced intimacy and solidarity between each other. It also indicated that the children were, to some degree, aware of the importance of showing their participation and being cooperative. This was in turn beneficial to establishing and maintaining their social relationships.

Nevertheless, although hao and dui both function as an acknowledgement marker in adult conversation, the children in the present study seldom used dui to mark acknowledgement. This result may be explained in terms of the subtle difference between the two markers, the children's linguistic competence and discourse contexts. First, previous research has suggested that hao and dui can both serve as acknowledgement markers in the exchange structure in adult conversation (Biq, 1998, Chen and Liu, 2009, Tsai, 2001, Wang et al., 2010 and Yu, 2004). Hao as an acknowledgment marker indicated that it is the speaker's obligation to take the present turn in order to release the other interlocutor from the responsibility to continue his/her turn (Wang and Tsai, 2005). Turn-taking is one of the communicative abilities that children develop rapidly over the first five years through infant-caregiver interactions (e.g. Casillas, 2014). It was less surprising that the five-year-old children in this study have acquired the ability to use hao to take the current turn and to show their receipt of information. On the other hand, dui as an acknowledgement marker shared similar functions as reaction tokens or backchannels when it forms a single turn (Tsai, 2001, Wang et al.,

2010 and Yu, 2004). It expresses the speaker's attention and interest in the current conversation and acknowledges the speaker's right to continue his/her current turn.

Second, that only hao, but not dui, served as an acknowledgement marker in the children's peer conversations may result from the backchannel usage dui has. When dui signals acknowledgement, it serves very similar functions with minimal utterances, such as reactive tokens or backchannels. It indicates not only the speaker's understanding but also his/her approval of the previous speaker to maintain the floor (Wang et al., 2010). According to Hess and Johnston (1988), backchannel responses are among the last acquired conversational skills in children's language development. They appear relatively late, at around age seven, and their frequency increases with age until children reach age 11. Moreover, unlike previous findings from adult conversations (Wang et al., 2010), dui appeared less frequently than hao did in the present data of the children's peer conversations. This may also indicate the children's incompetence in using the relatively advanced discourse function of dui as an acknowledgement marker.

Third, that only hao, instead of dui, functioned as an acknowledgement marker in our data may also be associated with the symmetrical and equal relations between peers. When dui functions as an acknowledgement marker, it shares functions similar to backchannels/reactive tokens. According to Clancy et al.'s (1996) categorization of reactive tokens, reactive expressions are the "short non-floor-taking words or phrases" (p. 359) a non-primary speaker utters during the interaction, which acknowledge that the other speaker can continue his/her previous topic. Because of the balanced relations between peers, children may show a stronger intention to take over the floor compared with when they interact with higher status roles. It seems that it was less likely for the children to use backchannels to pass their turn and encourage their peer to continue talking.

#### 4.3. Dui as a topic transition marker

Previous studies on adult conversations have suggested that both hao and dui function as transition markers to set up an expectation that a new topic is about to begin (Chen and Liu, 2009, Tsai, 2001, Wang et al., 2010 and Yu, 2004). In the present study, the children demonstrated an ability to use dui as a topic transition marker to signal topic shifts. Earlier findings have shown that dui serves the function of information management as a "planning marker" (Yu, 2004, p. 50) to signal topic transition (Tsai, 2001 and Wang et al., 2010). Dui also provides the speaker an exit from the current topic and entry into a new and unrelated one. In the children's peer conversations in the current study, they used dui with the particle *le* to signal a thematic break. Dui *le* indicates the closure of a current topic and the beginning of a new one, as discussed in previous research (Tsai, 2001, Wang et al., 2010 and Yu, 2004). Dui *le* as a transition marker enables the speaker to interrupt the ongoing topic and sets up an expectation that a new topic is about to begin (Wang et al., 2010). The children used dui or dui *le* to organize the macrostructure of their conversation. Their use of dui displayed the close relations of the following utterance to the prior turn and justified their own following utterance. Similar to the adult usage, the children's use of dui as a topic transition marker indicated the speakers' stance toward the path of discourse coherence to be developed.

Nevertheless, although other studies have found that Mandarin-speaking children at age five also have the ability to use hao in the ideational structure to mark topic transition (Huang, 2000), the children in the present study used dui to mark topic shifts. This result may be related to the qualitative differences between the two markers and the discourse context in the study. When hao indicates topic transition, it is often used by the speaker as a boundary marker of (pre-)closure or transition to signal the end of a talk, or to negotiate the closure of the current topic (Wang and Tsai, 2005, Wang et al., 2010 and Xu, 2005). Dui, on the other hand, functions as a continuity marker to provide the speaker an exit from the current topic and entry into a new and unrelated one (Tsai, 2001, Wang et al., 2010 and Yu, 2004). The children in this study used dui to open up a new topic in order to further develop their conversation with peers and to imply discourse continuity.

In addition, the children may be sensitive to the relations with their interlocutors, who in this study were their peers. As previous studies suggested, children's uses of different discourse markers reflect their recognition of social relations (Andersen et al., 1999). Children tend to use certain discourse

markers when they act in high status roles and use the other markers in low status roles during pretend play.

Moreover, in Andersen's (1996) study on children's use of boundary markers in pretend play, the results suggested that not only frequency but also particular types were distributed differently across roles. For example, higher status roles such as parents use lexical markers more frequently than lower status roles. In addition, parent roles use 'well' more frequently when talking to their children; however, they seldom use it when talking to each other. Andersen (1996) proposed that particular types such as 'well' may display "authoritative connotations" (p. 131) and are more likely to be used when interacting with lower status roles. The findings from the present study may indicate a similar interpretation.

According to Chen and Liu (2009), hao as a transition marker has the pragmatic function of claiming or reclaiming speakership, which indicates the speaker's power to control the topics or situations. It is often used by speakers with higher status, such as teachers or radio program hosts, who have the power to decide on and control the topics. Therefore, hao as a transition marker in Mandarin may also have an authoritative connotation.

Peers, unlike parents and children, share a balanced and symmetrical relation with each other (Piaget, 1932). In the current study, the children's use of such a discourse marker related to high status roles, like hao to mark topic shifts, may cause damage to their friendships. However, the children had developed their linguistic competence of discourse coherence and as such they chose dui instead of hao to signal topic transitions in their conversations. This finding, along with our other findings, suggested that the children's use of the discourse markers hao and dui when communicating with their peers demonstrated their linguistic ability and further indicated that their understanding of social relations might be reflected in the functions of discourse markers as well as the types they used.

## 5. Conclusion

The present study aimed to investigate how Mandarin-speaking 5-year-old children used the two frequently appearing discourse markers hao 'okay' and dui 'right' when interacting with peers and how such use reflected the characteristics of peer interaction. The findings suggested that the children showed a linguistic ability to use both markers hao and dui in different discourse structures for various functions. They used hao in three discourse structures—the information state, the exchange structure, and the action structure—while they used dui in the information state, the exchange structure, and the ideational structure.

As for discourse functions, they used hao as an agreement/acceptance marker, an acknowledgment marker, a marker of directives or assertives, and a marker of the interaction between the interlocutors' knowledge and meta-knowledge. They used dui as an agreement marker, a transition marker, and a marker of the interaction between the speakers' mental states. Nevertheless, they may acquire certain functions of the two markers later in the language development process. The results also suggested that the children were aware that their social relations with peers were symmetrical and balanced, and they were capable of using discourse markers as social registers to reflect such relations.

Although there were limitations in the children's ability to use the various functions of discourse markers hao and dui, the children showed linguistic competence in using the two markers. Moreover, they demonstrated their social recognition and were able to maintain and establish their relations with peers by the functions of these markers at an early age. It can be concluded that the Mandarin-speaking children's use of hao and dui not only demonstrates their communicative skills but also reflects the particular nature of peer interaction.

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## Appendix. Transcription conventions and gloss abbreviations

(Adopted from MacWhinney, Brian. 1995. *The CHILDES project: Tools for analyzing talk*. Hillsdale, NJ: Lawrence Erlbaum Associates.)

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# Lexical Selection Differences Between Monolingual and Bilingual Listeners

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**Abstract.** Three studies are reported investigating how monolinguals and bilinguals resolve within-language competition when listening to isolated words. Participants saw two pictures that were semantically-related, phonologically-related, or unrelated and heard a word naming one of them while event-related potentials were recorded. In Studies 1 and 2, the pictures and auditory cue were presented simultaneously and the related conditions produced interference for both groups. Monolinguals showed reduced N400s to the semantically-related pairs but there was no modulation in this component by bilinguals. Study 3 inserted an interval between picture and word onset. For picture onset, both groups exhibited reduced N400s to semantically-related pictures; for word onset, both groups showed larger N400s to phonologically-related pictures. Overall, bilinguals showed less integration of related items in simultaneous (but not sequential) presentation, presumably because of interference from the activated non-English language. Thus, simple lexical selection for bilinguals includes more conflict than it does for monolinguals.

**Keywords:** Bilingualism; Lexical selection; Conflict resolution; Event-related potentials.

## 1. Introduction

In the bilingualism literature, language processing and executive control (EC) are usually investigated separately. For the former, bilinguals typically exhibit lower levels of language proficiency and slower linguistic processing than monolinguals (review in Kroll, Dussias, Bogulski, & Valdes Kroff, 2012); for the latter, bilinguals often demonstrate faster or more efficient processing on non-verbal cognitive control tasks than monolinguals (review in Bialystok & Craik, 2010). Explanations for observed bilingual processing advantages in non-verbal tasks have focused on descriptions of how bilinguals manage their two languages, essentially combining these two areas of investigation. The key point is that both languages of a bilingual are jointly activated, so bilinguals must select between the target and distractor languages and ignore alternatives from the non-target language. This constant need to resolve competition between jointly-activated languages explains both the difficulty in linguistic processing and the enhancement of domain-general control (Bialystok, Craik, Green, & Gollan, 2009). Yet, monolinguals are also subject to selection pressures from within-language alternatives (e.g., cup vs. mug). If this selection process is similar for monolinguals within a language as it is for bilinguals selecting across languages, then such linguistic selection is unlikely to be responsible for the bilingual advantages in domain-general control because speakers in both groups should benefit equally. The present study used event-related potentials (ERPs) to compare these lexical selection processes for monolinguals and bilinguals within a single language. The hypothesis is that cross-language selection adds unique processing demands for bilinguals and results in less within-language integration on related stimuli even within a single language. Failure to

integrate related within-language stimuli would reflect greater conflict and the need to recruit more EC. Thus, evidence for different processes underlying lexical selection in a single language will clarify the putative mechanism by which bilingualism leads to enhanced executive control and link the two lines of research into a more coherent explanation.

The notion motivating the present study is that the continual involvement of executive control in language selection makes language processing inherently different for bilinguals than it is for monolinguals. As such, selection between lexical competitors will be carried out differently by the two groups. Support for this claim comes from studies by Marian and colleagues who compared monolingual and bilingual performance on within-language phonological competition using both eye-tracking (Blumenfeld & Marian, 2011) and functional MRI (Marian, Chabal, Bartolotti, Bradley, & Hernandez, 2014). In the visual world paradigm, participants search for a target in a display of four pictures (or objects). On competitor trials, one of the pictures shares a phonological onset (e.g., candy) with the target (e.g., candle). Consistent with previous studies, more fixations were observed on phonological competitors than unrelated pictures for both monolinguals and bilinguals (Alloppenna et al., 1998, Desroches et al., 2006 and Marian and Spivey, 2003). Blumenfeld and Marian further postulated that since the phonological distractor was a strong lexical competitor, it should require greater inhibition and produce larger negative priming effects in subsequent responses to that quadrant than would neutral pictures on a probe task. The authors found that the monolingual group, but not the bilingual group, was slower to identify the location of a gray asterisk among black asterisks when it was in the location previously occupied by the phonological distractor than they were for gray asterisks in a control location. Thus, larger negative priming was found for monolinguals than for bilinguals suggesting that bilinguals demonstrated better control by being able to disengage attention following the trial. Consistent with this interpretation, Marian et al. (2014), found that monolinguals showed greater recruitment of executive control regions (e.g., anterior cingulate, superior frontal gyrus) when performing the task, indicating more effortfulness. These studies demonstrate that monolinguals and bilinguals use different selection and inhibitory processes to understand isolated words, supporting the possibility for different engagement of EC resources in lexical processing.

Similar arguments can be applied to the way in which monolinguals and bilinguals process semantic competition. In the monolingual literature, semantic competition has been demonstrated by means of more fixations to semantic competitors in a visual world paradigm (e.g., Huettig & Altmann, 2005) and slower picture naming latencies following a semantic prime (e.g., Schriefers, Meyer, & Levelt, 1990). Yet little is known about how bilinguals resolve semantic competition. For bilinguals, several models assume a shared but language-independent semantic/conceptual store (e.g., Revised Hierarchical Model, Kroll & Stewart, 1994; Bilingual Interactive Activation model, Dijkstra & van Heuven, 2002; Distributed Lexical/Conceptual Feature Model, De Groot, 1992; see Francis, 2005 for a review). As such, the strength and nature of lexical links from each language to semantic knowledge may differ depending on specific linguistic knowledge, but simple semantic processing (e.g., is the object in this picture natural or man-made?) is likely to be comparable for monolinguals and bilinguals (Gollan, Montoya, Fennema-Notestine, & Morris, 2005). Nonetheless, selecting a concept for language production is not akin to simple semantic processing, since speakers must select between close yet competing alternatives and attach this concept to a word in one language.

Understanding how resolution of phonological and semantic competitors may differ for bilingual and monolingual listeners is important because it will provide insight into explaining the enhancement of EC found for bilinguals. Examining how conflict resolution unfolds in real time is best determined with event-related potentials (ERPs), a measure that is sensitive to online processing. Consequently, we utilized a speech perception task to examine processes that are used during language production, namely identifying pictures and assigning them labels. In the Picture Selection Task, each target picture (e.g., monkey) was paired with an alternative that was related semantically (e.g., gorilla), phonologically (e.g., money), or unrelated (e.g., belt). An auditory word was simultaneously presented and participants were required to select the named picture by means of a key press. Based on previous eye-tracking studies, related stimuli were expected to induce response

competition (e.g., Allopenna et al., 1998 and Blumenfeld and Marian, 2011). For semantic competition, both pictures must be recognized so the distinctive features for the target word can be identified and associated with an appropriate lexical label. For phonological competition, the target word must be interpreted in the correct language, but bilinguals need to attend to the phonological information relevant only for that language and possibly ignore the translation equivalents activated by the pictures. Thus, the nature of the competition from these two sources is expected to be substantially different from each other.

Given the novelty of the task, it is difficult to fully predict the electrophysiological outcomes, but extrapolation from previous ERP studies leads to several hypotheses. For semantically-related pairs, the most relevant ERP component is the N400. This component is sensitive to semantic and lexical mismatches between the stimulus and expectations such that mismatches are associated with larger negative amplitudes than matches (Kutas & Federmeier, 2011). In paradigms in which two semantically related pictures are presented either sequentially (Holcomb and McPherson, 1994 and McPherson and Holcomb, 1999) or simultaneously (Zani et al., 2015), relatedness has resulted in less N400 negativity than found on unrelated pairs. This attenuation of the N400 for related primes has been interpreted as semantic integration (Holcomb and McPherson, 1994 and Kutas and Federmeier, 2011). Presenting phonologically-related stimuli simultaneously has also been found to produce less negative waveforms than unrelated pairs (e.g., Dumay et al., 2001 and Praamstra et al., 1994). For example, Dell'Acqua et al. (2010) reported that electrophysiological responses to pictures with phonologically-related superimposed words (i.e., the picture name and word shared two or three initial phonemes) produced less negative waveforms from 250 to 450 ms than unrelated pairs.

The demands of the Picture Selection Task differ from priming tasks and relatedness judgments used in previous research where recognizing the relationship between stimuli aids responses. Consequently, phonological and semantic competition in the present case is expected to result in longer response times than will be found for unrelated stimuli. In the ERP data, it would be reasonable to hypothesize that greater negativity in the N400 would be observed in the presence of conflict. However, a study by Blackford, Holcomb, Grainger, and Kuperberg (2012) found a different pattern: when a semantically-related auditory prime preceded a picture, there was a reduced N400 but longer picture naming time than there was for an unrelated prime. The N400 indexed the perceived relationship between the prime and the target, but the recognition of the relationship interfered with their ability to make a verbal response. In the present paradigm, participants must also select between two related alternatives. Thus, it was hypothesized that for monolinguals, related pairs would produce both N400 attenuation and behavioral interference expressed as longer RTs.

A study by Kotz (1997) provides insight into potential group differences between monolinguals and bilinguals in their electrophysiological responses to related stimuli. Participants performed a visual lexical decision task that included a semantic priming manipulation, with primes presented at three SOAs. Monolinguals exhibited N400 attenuation for related prime-target pairs at all three SOAs but bilinguals exhibited a reduction in the N400 at SOAs of 200 ms and 800 ms but not at 0 ms when the target and prime were presented simultaneously. Kotz offered several possible explanations for this difference including less automatic spreading activation in bilinguals and insufficient time to access the meaning of both words in the L2. However, unlike longer SOAs, an SOA of 0 ms presents a problem of concurrent selection, a situation that may differentially impact bilinguals and monolinguals because it is similar to the bilingual experience in which concurrent selection is an ongoing processing requirement. The present study simulates this situation by asking participants to select between two pictures while an auditory cue is presented simultaneously. For monolinguals this results in selection between two lexical alternatives (e.g., fly, bee), but bilinguals must also consider the alternatives across languages (e.g., fly/mouche, bee/abeille). This greater selection demand for bilinguals may change the effect of stimulus relatedness for the bilinguals wherein they fail to integrate the relationship between pictures resulting in larger N400 negativity on the related pairs than is found for monolinguals.

In sum, the present studies used a novel paradigm to investigate whether bilinguals and monolinguals engage in similar selection processes during resolution of competing alternatives. The

question is important because differences in such processes may be one of the mechanisms responsible for generalized advantages for bilinguals in nonverbal executive control. The hypothesis is that selecting between lexical options engages different processes for monolinguals and bilinguals, even when the task is carried out in a single language. Specifically, the expectation is that competition from within-language alternatives is more difficult to resolve and requires more executive control for bilinguals because of ongoing interference from the other language. Thus, it was hypothesized that both groups would experience behavioral interference in response to phonologically- and semantically-related pairs, but only monolinguals would exhibit N400 attenuation to related stimuli (cf., Kotz, 1997). The results will contribute to an understanding of potential differences in linguistic processing by monolinguals and bilinguals that may be relevant for the broader cognitive differences reported elsewhere.

## 2. Study 1

### 2.1. Method

#### 2.1.1. Participants

Fifty-six young adults participated in this study. Data from 3 participants were excluded due to poor EEG quality or technical difficulties. An outlier analysis led to the exclusion of one bilingual whose behavioral results were more than 3 SDs above the group mean. Thus, the final sample consisted of 26 monolingual and 26 bilingual participants. The monolinguals were native English speakers with only limited school exposure to a second language. The bilinguals spoke both English and one of the following languages fluently: Vietnamese (3), Spanish (3), French (3), Urdu (3), Gujarati (2), Hindi (2), Tamil (2), Arabic, Armenian, Cantonese, Danish, Polish, Romanian, Russian, or Serbian. Demographic and background measures are presented in Table 1. Participants received course credit for their participation.

#### 2.1.2. Tasks and procedures

##### 2.1.2.1. Peabody Picture Vocabulary Test-III (PPVT-A; Dunn & Dunn, 1997)

This is a standardized test of receptive English vocabulary knowledge. Participants identify which of four pictures corresponds to a spoken word. The standard score has a  $\mu = 100$  and a  $SD = 15$ .

##### 2.1.2.2. Picture Selection Task

One hundred and sixty black and white line drawings were selected from Cycowicz et al., 1997 and Snodgrass and Vanderwart, 1980, and the internet (see Table A.1 for picture names and Table A.2 for stimuli characteristics). There were 40 target pictures (e.g., monkey) and 40 of each of the three distractor types: semantically-related (e.g., gorilla), phonologically-related (onset overlap; e.g., money) and unrelated (e.g. belt). The task was programmed in E-prime and presented on a Dell 1908 FP Flat Panel monitor. Picture names were recorded by a female native-speaker of English using Audacity software

(<http://123.233.119.36:80/rwt/119/http/MF4XIZLDNF4HTLUUN74YEZ5FM3YYE35FF3YGK7A/>) and saved as 16 bit WAV files with a sampling rate of 44,000 Hz.

Each trial began with a fixation cross in the center of a white screen situated 60 cm from the participant. To control for anticipatory ERP artifacts, the fixation remained for either 500 or 1500 ms, after which two pictures appeared, one on either side of the cross. Each picture had a visual angle of  $9.08^\circ$ . Simultaneously, participants heard the name of one of the pictures and were asked to indicate as quickly and accurately as possible which picture was named by pressing the response key on the corresponding side of the display. Picture location was randomly generated by the program. The pictures disappeared after the response. Each target picture was presented six times, twice with each distractor. Within each pairing, the correct response was the target picture once and the distractor picture once. The latter were considered filler trials and were not analyzed.

#### 2.1.3. EEG recording

The electroencephalogram (EEG) was continuously recorded from 64 Ag–AgCl active electrodes that followed the International 10/20 system sites using the BioSemi Acquisition System (BioSemi ActiveTwo, Amsterdam). Six additional electrodes were used: one electrode on each mastoid as a reference for off-line processing, one electrode 1 cm below each eye for measuring vertical

electro-oculogram and one electrode placed 1 cm to the left and right of the outer-canths of each eye for measuring horizontal electro-oculogram. Continuous EEG was recorded at a sampling rate of 512 Hz with a band-pass filter of .01–80 Hz. During the recording, the electrodes were referenced to the common mode sense electrode. Impedances were maintained below 25 k $\Omega$ .

Off-line processing was performed using EEGLAB v10.2.2.4b toolbox under MATLAB v7.14 (2012, Mathworks, Natick, MA). The EEG was re-referenced offline to the average mastoid measurements. The EEG was segmented into epochs that were baseline-corrected (–200 ms to 0 ms) and stimulus-locked from 200 ms of pre-stimulus activity to 800 ms of post-stimulus activity. Electrode sites with high frequency noise were interpolated. Trials indicative of muscle tension, drift, or head movements were removed prior to conducting the eye artifact detection and rejection procedure using a simple voltage threshold of 400  $\mu$ V. Eye movements and eye blinks were detected and corrected using the Independent Components Analysis (ICA; Makeig, Bell, Pung, & Sejnowski, 1996), a valid tool in preserving the brain activity of interest while “filtering” eye artifacts out of the signal (Mennes, Wouters, Vanrumste, Lagae, & Stiers, 2010). Remaining ocular artifacts were removed using a simple voltage threshold of 150  $\mu$ V. Individual ERPs were created for each participant by electrode site and condition.

## 2.2. Results

### 2.2.1. Background measures

Maternal education was measured on a 5-point Likert scale where 1 indicated no high school diploma, 2 was high school graduate, 3 was some college or college diploma, 4 was a bachelor's degree and 5 was a graduate or professional degree. There were no significant differences between monolinguals and bilinguals on age or maternal education, all  $p$ s > .20. Bilinguals scored somewhat lower on the English PPVT than monolinguals,  $F(1, 50) = 3.81$ ,  $p = .057$  (cf., Bialystok & Luk, 2012). These results are shown in Table 1.

### 2.2.2. Behavioral results

RTs longer than 3 s were removed from the analysis and then RTs 2.5 SDs greater than the individual's mean for each condition were also removed. This constituted the removal of 2.7% of the data for each language group. Accuracy analyses were conducted on square-root transformed errors in order to minimize the impact of any one participant (Myers, 1979). The mean RT and percentage error rates for each distractor type by language group are presented in Table 2.

A 2-way ANOVA on RTs for language group and distractor type (semantically-related, phonologically-related, unrelated) showed a main effect of distractor type,  $F(2, 100) = 192.64$ ,  $p < .001$ ,  $\eta^2 = .79$ , in which all three conditions differed significantly (semantically related > phonologically related > unrelated), all  $p$ s < .001. There was no main effect of language group,  $F < 1$ , but there was a significant interaction of language group by distractor type,  $F(2, 100) = 3.80$ ,  $p < .05$ ,  $\eta^2 = .07$ . However, none of the simple effects analyses revealed any pairwise comparisons that could account for the interaction. In the error analysis, there was a main effect of distractor type,  $F(2, 100) = 105.42$ ,  $p < .001$ ,  $\eta^2 = .68$ , in which all three distractor types produced significantly different error rates (semantically related > phonologically related > unrelated), all  $p$ s < .001. Bilinguals made more errors than monolinguals,  $F(1, 50) = 3.97$ ,  $p = .05$ ,  $\eta^2 = .07$ , with no interaction of distractor type by language group,  $F < 1$ .

### 2.2.3. EEG results

The task elicited a series of peaks that was largest over central-parietal electrode sites. ERP analyses focused on mean amplitude in the N400 time window (400–500 ms) at 12 electrode sites (FC1, FCz, FC2, C1, Cz, C2, CP1, CPz, CP2, P1, Pz, P2) arranged in a 3 lateral by 4 anterior–posterior grid (see montage in Fig. 1). The main interest was in potential processing differences between language groups on related pairs relative to unrelated pairs. Thus, separate analyses were done comparing language groups for phonological competition (phonological vs. unrelated) and semantic competition (semantic vs. unrelated). ERP waveforms for a representative electrode (CPz) are presented in Fig. 1. Only analyses that contained effects of distractor type and language group are reported. The Greenhouse-Geisser correction was applied to variables with more than one degree of freedom in the numerator. Only correct responses were included in these analyses.

In the analysis examining semantically-related and unrelated pairs, there were no main effects of language group,  $F < 1$ , or distractor type,  $F(1, 50) = 2.57$ ,  $p = .12$ , but there was a significant interaction between them,  $F(1, 50) = 4.14$ ,  $p < .05$ ,  $\eta^2 = .08$ . Simple main effects analyses revealed that there was a reduced negativity of the N400 for the semantically-related pair relative to the unrelated pair for monolinguals,  $F(1, 50) = 6.62$ ,  $p < .02$ ,  $\eta^2 = .17$ , but not for bilinguals,  $F < 1$ . That is, the monolinguals showed attenuation of the N400 in response to semantic relatedness. No other effects were significant, all  $ps > .24$ .

In the phonological competition analysis, there were no main effects of either language group or distractor type, both  $Fs < 1$ . There was a marginal interaction of language group by distractor type,  $F(1, 50) = 3.70$ ,  $p = .06$ ,  $\eta^2 = .07$ . Bilinguals exhibited marginally larger N400s for phonologically-related pairs than unrelated pairs,  $F(1, 50) = 3.41$ ,  $p = .07$ ,  $\eta^2 = .06$ . No differences were observed in the monolingual group,  $F < 1$ . No other effects approached significance, all  $ps > .13$ .

### 2.3. Discussion

Study 1 examined the neural underpinnings of lexical selection in bilinguals and English monolinguals. Behaviorally, both groups were slower to identify the target in the presence of related distractors than unrelated distractors, with semantically-related lures producing the slowest responses and phonologically-related lures faster than these but still slower than unrelated pairs. These data demonstrate that during response selection, both groups were sensitive to the relationship between the pictures, and similarity interfered with speed of selection. The lack of behavioral group differences is consistent with work by Marian and colleagues (Blumenfeld and Marian, 2011 and Marian et al., 2014) who argued that motor responses may not be sufficiently sensitive to capture between-group differences.

Where the groups differed was in how they processed the semantic competition as shown in the electrophysiological data. Specifically, monolinguals exhibited less negativity in the N400 for the semantically-related condition than in the unrelated condition while bilinguals did not. Attenuation of the N400 in response to a semantic relationship is consistent with results of monolingual studies using pictures (e.g., Chauncey et al., 2009, McPherson and Holcomb, 1999 and Zani et al., 2015), but few studies have shown N400 attenuation coupled with longer RTs. Blackford et al. (2012) suggested that the N400 indexes how the semantic relationship is perceived and integrated (i.e., automatic electrophysiological semantic priming) but does not directly reflect the factors involved in later response selection. However, if this were the full explanation, then the bilinguals should have also have shown N400 attenuation to the semantic relationship as they have in studies using semantic priming (Duñabeitia et al., 2010, Kerkhofs et al., 2006 and Kotz and Elston-Güttler, 2004). Yet, in both the current study and Kotz (1997), simultaneous presentation of related stimuli did not produce N400 attenuation for bilinguals.

To explain these findings, consider that the N400 indexes automatic semantic integration but is also modulated by attention (see Kutas & Federmeier, 2011 for a review). Since bilinguals activate lexical alternatives from both languages, the two presented items may not be integrated because they do not exhaust the possibilities for bilinguals, specifically, the jointly-activated labels from their other language. Consequently, uncertainty remains for the bilinguals because the two pictures are not fully integrated by the word in a single language. This situation would result in the lack of N400 attenuation observed in the semantic condition for the bilinguals.

Unlike the semantic analysis, the electrophysiological effects in the phonological analysis failed to reach significance. The behavioral effect in this condition was smaller than in the semantic manipulation confirming that it was a subtler manipulation. Blackford et al. (2012) also failed to observe a significant phonological ERP effect despite significant behavioral effects. One possibility is that the heterogeneous language backgrounds of the bilinguals may have masked group differences because of variability from multiple cross-language alternatives. This possibility was addressed in Study 2.

## 3. Study 2



The interpretation for the results in Study 1 was that bilinguals needed to manage conflict from their non-English language as well as the conflict introduced by the relation between the pictures, so deciding between semantically-related alternatives was more effortful and involved more executive control than it did for monolinguals. However, because the bilinguals were linguistically heterogeneous, the potential phonological competition from the non-English words was unknown. Therefore, to have a more precise understanding of the competition on each trial, a second study was performed in which the bilinguals were all English–French bilinguals, making the non-English label transparent. These participants performed the Picture Selection Task in both English and French. A fourth condition was added to evaluate the effect of between-language phonological interference in which the target picture was phonologically-related to the translation of the distractor.

### 3.1. Method

#### 3.1.1. Participants

Fifty-two young adults participated in this study. Data from nine participants were excluded due to poor EEG quality. One bilingual and one monolingual participant were excluded because their behavioral effects were at least 3 SD outside the group mean. The final sample consisted of 21 monolingual and 20 bilingual participants. The monolinguals were native English speakers with only limited school exposure to a second language. The English–French bilinguals had either French at home (10 out of 20 participants) and/or had been enrolled in a French immersion program from elementary to the end of high school (18 out of 20 participants). Sixteen bilinguals indicated some minimal knowledge of a third language. Demographic and background measures are shown in Table 1. The bilinguals were tested in counterbalanced English and French sessions one week apart. The monolinguals only completed the English session.

#### 3.1.2. Tasks and procedures

##### 3.1.2.1. Peabody Picture Vocabulary Test-III (PPVT; Dunn & Dunn, 1997)

The procedures for the English PPVT were the same as those described in Study 1. To measure French receptive vocabulary in the bilingual group, the target words from Form-B of the PPVT were translated into French<sup>1</sup> and administration followed the same procedures as for the English version. Bilinguals performed both language versions, with instructions provided in the target language.

##### 3.1.2.2. Picture Selection Task

The English Picture Selection Task was modified to include a between-language phonological condition (“phonological-between”) in which the target picture was phonologically-related to the translation of the distractor. For example, moose was paired with windmill as its distractor, since the French word for windmill is moulin. This manipulation is similar to that used by Marian and Spivey (2003) in their eye-tracking study: Russian–English participants performing the task in English had to make an eye movement to an item such as a marker when one of the distractors was a stamp, called “marka” in Russian. In their study, the cross-language phonological distractor created interference. A French version of the task was also created and administered to the bilinguals (see Table B.1 and Table B.2 for the English and French stimuli, respectively, and Table B.3 for word characteristics). Each word was recorded by female native speakers of each language using Audacity 2.0 at a sampling rate of 44.1 kHz. Each picture was formatted to be 5.9° in visual angle. The EEG recording procedures from Study 1 were implemented.

### 3.2. Results

#### 3.2.1. Background measures

Mean scores and standard deviations for the background measures are reported in Table 1. There were no significant differences between groups on maternal education,  $F(1, 39) = 1.41$ ,  $p = .24$ . Bilinguals obtained higher scores on English PPVT than on the French PPVT,  $F(1, 19) = 9.74$ ,  $p < .01$ ,  $\eta^2 = .34$ . However, if these scores are examined separately for those bilinguals who spoke French at home ( $n = 10$ , English PPVT = 106.5, French PPVT = 102.5) and those who did not ( $n = 10$ , English PPVT = 109.5, French PPVT = 97.4), the difference between English and French scores was not significant for the first,  $t(9) = 1.15$ , n.s., but was significant for the second,  $t(9) = 3.43$ ,  $p < .01$ .

#### 3.2.2. Behavioral results

RTs longer than 3 s were removed from the analysis and RTs 2.5 SDs greater than the individual's mean for each distractor type were also removed. In the English task, this constituted the removal of 2.7% and 2.6% of the data for the monolinguals and bilinguals, respectively. In the French task, 2.6% of the data was removed. Accuracy analyses were conducted on square-root transformed error rates. The mean RTs and percentage error rates for each distractor type by language group are presented in Table 3.

For the English task, a 2-way ANOVA on RTs for language group and distractor type (semantic, phonological-within, phonological-between, unrelated) showed a main effect of distractor type,  $F(3, 117) = 143.92$ ,  $p < .001$ ,  $\eta^2 = .79$ , in which the semantic distractor produced significantly longer RTs than the phonological-within distractor,  $p < .001$ , which in turn produced longer RTs than the unrelated distractor,  $p < .02$ . The phonological-between distractor did not differ significantly from the phonological-within or the unrelated distractors. This replicates the pattern found in Study 1, with the new distractor, phonological-between, not forming a distinct category but situated between the phonological and unrelated conditions. In the error analysis, there was a main effect of distractor type,  $F(3, 117) = 84.01$ ,  $p < .001$ ,  $\eta^2 = .68$ , in which the semantic distractor produced more errors than the phonological-within distractor,  $p < .001$ , and the phonological-within produced significantly more errors than the phonological-between distractor,  $p < .02$ . Again, the phonological-between and unrelated distractors did not differ significantly from each other. Neither the main effect of language group nor the distractor type by language group interaction was significant,  $F_s < 1$ .

To compare performance on the English and French tasks for bilinguals, a 2-way ANOVA on RT was conducted with task language and distractor type as within-subject factors. There was no main effect of task language,  $F(1, 19) = 1.94$ ,  $p = .18$ , but there was a main effect of distractor type,  $F(3, 57) = 117.56$ ,  $p < .001$ ,  $\eta^2 = .86$ , in which semantically-related pairs produced longer RTs than all the other conditions (all  $p_s < .001$ ), with no differences between the other conditions. In the error analysis, there was a main effect of distractor type,  $F(3, 57) = 62.18$ ,  $p < .001$ ,  $\eta^2 = .77$ , in which the semantically-related pairs produced more errors than all other conditions,  $p_s < .001$ , and the phonological-within produced more errors than the unrelated condition,  $p < .01$ . There was a main effect of task language,  $F(1, 19) = 5.81$ ,  $p < .05$ ,  $\eta^2 = .23$ , in which more errors were produced in French than in English. The interaction between task language and distractor type was not significant,  $F < 1$ . Follow-up RT analyses comparing the subsets of bilinguals in terms of the presence of French at home revealed no main effect of language background,  $F < 1$ , and no interactions of language background with task language or distractor types, all  $p_s > .51$ . For the error rates, there was no main effect of language background,  $F < 1$ , and no interaction of language background with the other variables, all  $p_s > .31$ .

### 3.2.3. ERP results

ERP waveforms were analyzed using the same electrode sites and time window (N400: 400–500 ms) as Study 1. To examine each type of competition as a function of language group in the English task, three 4-way ANOVAs for language group, condition, laterality, and anteriority were conducted. Only effects that include distractor type are reported. The ERP waveform for the monolingual group is presented in Fig. 2a and the ERP waveforms for the bilingual group performing the task in English and French are presented in Fig. 2b and c, respectively.

In the analysis comparing semantically-related to unrelated pairs, there was no main effect of language group,  $F(1, 39) = 2.85$ ,  $p = .10$ , but there was a marginal effect of distractor type,  $F(1, 39) = 3.72$ ,  $p = .06$ ,  $\eta^2 = .09$ , and a marginal language group by distractor type interaction,  $F(1, 39) = 3.08$ ,  $p = .08$ ,  $\eta^2 = .07$ . Because these values were close to standard levels of significance and there were a priori reasons to expect the direction of the interaction, simple effects analyses were conducted. The simple main effects revealed that there was reduced N400 negativity on the semantically-related distractor condition relative to the unrelated condition for monolinguals,  $F(1, 20) = 6.41$ ,  $p = .02$ ,  $\eta^2 = .24$ , but not for bilinguals,  $F < 1$ . No other effects were significant, all  $p_s > .10$ .

For the phonological-within distractor analysis, there were no main effects of language group,  $F(1, 39) = 1.97$ ,  $p = .17$ , distractor type,  $F < 1$ , or their interaction,  $F < 1$ . No other effects were significant, all  $p_s > .13$ . For the phonological-between distractor analysis, there was no main effect of language

group,  $F(1, 39) = 1.44$ ,  $p = .24$ , distractor type (phonological-between and unrelated),  $F < 1$ , or their interaction,  $F < 1$ . No other effects were significant, all  $ps > .26$ .

A series of analyses on the N400 in the bilingual group comparing language (English and French) by distractor type (semantic and unrelated; phonological-within and unrelated; phonological-between and unrelated) showed no differences between the English or French version of the task, all  $ps > .17$ . Follow-up analyses comparing language background (English–French bilinguals who had French in the home versus those who did not) by task language and distractor type revealed no main effect of language background, all  $Fs < 1$ , and no interactions of language background with distractor type or task language, all  $ps > .31$ .

### 3.3. Discussion

Two main results from Study 1 were replicated with a linguistically-homogenous group of bilinguals performing the task in English. First, the phonological-within and semantic conditions produced longer RTs and more errors than the unrelated condition for both language groups. Second, significant N400 attenuation was observed for the semantically-related condition for the monolinguals in English but not for the bilinguals in either language. The relation between the two pictures is therefore critical for the response and the conceptual overlap between the pictures in the semantically-related condition led to a reduced N400 for monolinguals. Thus, in two studies, monolinguals but not bilinguals showed evidence of integrating the semantically-related pictures in the presence of the auditory cue. These results replicate those found by Kotz (1997) in a semantic priming paradigm when the two words were presented concurrently (SOA of 0 ms). In her study, monolinguals but not bilinguals exhibited a reduced N400 on the semantically-related pairs. Kotz's explanation was weaker L2 proficiency and slower spreading activation speed in bilinguals. However, this explanation is unlikely to apply to the results of Study 2 since bilinguals and monolinguals obtained equivalent scores on English vocabulary knowledge and no differences were observed between bilinguals who had learned French at home and those who had English at home and learned French in an immersion program. A more likely explanation is that the electrophysiological differences reflect different selection demands for the bilinguals.

No significant phonological effects in the electrophysiological data were observed in Study 2. One possibility is that the simultaneous presentation of the auditory cue and the pictures allowed insufficient time for competition to build at the word-phoneme level before the correct picture was identified. Consistent with this idea, previous research that has found within-language phonological competition effects using both ERP (Desroches, Newman, & Joanisse, 2009) and eye-tracking (Blumenfeld & Marian, 2011) employed a paradigm in which there was a delay between the presentation of the pictures and the auditory cue. In Desroches et al.'s paradigm, participants saw a picture and after a delay heard an auditory cue that either matched or mismatched the picture. Mismatches produced larger N400s than matches, with the largest amplitude observed when the auditory cue shared an onset (e.g., candle) with the name of the picture (e.g., candy) (an onset mismatch). This methodology enables participants to assign a label to the pictures, generate expectations about the upcoming auditory cue and hold them in memory before being required to make a lexical selection.

## 4. Study 3

The goal of Study 3 was to investigate the locus of group differences in processing semantic competition. In Studies 1 and 2, the pictures and auditory cue were presented simultaneously, creating a situation in which three stimuli needed to be processed. Consequently, the differences in semantic processing between language groups may have been due to how participants processed the relation between the pictures or how they processed the triad, which consisted of the two pictures and the auditory cue. To distinguish between these possibilities, Study 3 removed the auditory cue from the triad by presenting it 800 ms after the picture onset to examine how the relation between the pictures is processed. If the semantic differences observed in Studies 1 and 2 were due to the relationship between the pictures and the word, then removing the word should lead to semantic integration and N400 attenuation for all participants. However, if the differences in the first two studies reflected the

failure of bilinguals to process the conceptual similarity between the pictures, then removing the auditory cue will not change the results and bilinguals will again show no attenuation of the N400.

#### 4.1. Method

##### 4.1.1. Participants

Twenty-five monolinguals and 29 bilinguals were recruited. Data from nine participants (5 monolinguals and 4 bilinguals) were excluded due to poor EEG quality. The final sample consisted of 20 monolinguals and 25 bilinguals. The monolinguals were native English speakers with only limited school exposure to a second language. The bilinguals spoke English and one of the following languages fluently: Cantonese (4), Mandarin (4), Farsi (4), Polish (2), Punjabi (2), Russian (2), Spanish (2), Arabic, Greek, Gujarati, Korean or Serbian. Demographic and background measures are presented in Table 1. Participants received course credit for their participation.

##### 4.1.2. Tasks and procedures

###### 4.1.2.1. Peabody Picture Vocabulary Test-III (PPVT; Dunn & Dunn, 1997)

This is the same measure employed in Studies 1 and 2.

###### 4.1.2.2. English Picture Selection Task

The task stimuli and procedure were modified from Study 2. Specifically, the phonological-between-language condition was removed and the auditory cue was presented 800 ms after the two pictures were presented.

#### 4.2. Results

##### 4.2.1. Background measures

Mean scores and standard deviations for background measures are reported in Table 1. Bilinguals reported higher maternal education,  $F(1, 44) = 7.29$ ,  $p = .01$ , than monolinguals but scored lower on English PPVT,  $F(1, 44) = 6.21$ ,  $p < .02$ .

##### 4.2.2. Behavioral results

The same trimming procedures from Studies 1 and 2 were used, leading to the removal of 2.3% and 2.5% of the data for monolinguals and bilinguals, respectively. The mean RTs and error rates for each distractor type by language group are presented in Table 4.

A 2-way ANOVA on RTs for language group and distractor type showed no main effect of language group,  $F(1, 43) = 1.30$ ,  $p = .26$ . There was a main effect of distractor type,  $F(2, 86) = 64.83$ ,  $p < .001$ ,  $\eta^2 = .60$ , in which the semantic condition produced significantly longer RTs than the phonological condition, which in turn produced longer RTs than the unrelated condition,  $ps < .001$ . The interaction of language group by distractor type was not significant,  $F(2, 86) = 1.66$ ,  $p = .21$ . In the error analysis, there was a main effect of distractor type,  $F(2, 86) = 57.80$ ,  $p < .001$ ,  $\eta^2 = .57$ , such that the semantic condition produced more errors than the phonological condition,  $p < .001$ , and the phonological condition produced more errors than the unrelated condition,  $p < .001$ . The main effect of language group and the interaction of language group by distractor type were not significant,  $F_s < 1$ .

##### 4.2.3. ERP results

ERPs were time-locked to the presentation of the pictures. The analyses were conducted on the picture-onset N400 (400–600 ms) and on the auditory-onset N400 (1150–1300 ms). For the picture-onset N400, 12 electrode sites (F1, Fz, F2, FC1, FCz, FC2, C1, Cz, C2, CP1, CPz, and CP2) in a 3 lateral by 4 anterior–posterior grid were analyzed. A fronto-central N400 effect was observed, consistent with the literature showing that the effect is more frontally-distributed for pictures than words (Giorgio, Kutas, & Sereno, 1996). For the auditory-onset N400, analyses were performed at 12 more posteriorly located electrode sites (FC1, FCz, FC2, C1, Cz, C2, CP1, CPz, CP2, P1, Pz, and P2) in a 3 lateral by 4 anterior–posterior grid. The ERP waveforms are presented in Fig. 3a for the monolingual group and Fig. 3b for the bilingual group. Only effects that contained distractor type and language group are reported.

Analysis of the semantic picture-onset N400 mean amplitudes revealed a main effect of semantic relatedness,  $F(1, 43) = 4.19$ ,  $p < .05$ ,  $\eta^2 = .09$ , indicating a smaller N400 amplitude for semantically-related than unrelated pairs. There was no main effect of group,  $F(1, 43) = 2.37$ ,  $p = .13$ , and no group by distractor type interaction,  $F < 1$ . There was a significant interaction of group by

anteriority by condition,  $F(3, 129) = 4.69$ ,  $p = .02$ ,  $\eta^2 = .10$ . Simple main effects analyses of the 3-way interaction revealed that the semantic effect was larger at frontal electrode sites for the monolinguals and at posterior sites for the bilinguals. Analysis of the auditory-onset N400s (1100–1300 ms) time window mean amplitudes for the semantic condition revealed no main effect of language group, distractor type, or language group by distractor type interaction, all  $ps > .18$ . Taken together, the semantic effect was observed only during picture-onset for both groups, indicating that in the absence of a concurrent auditory cue, bilinguals integrated the semantic relationship between the pictures similarly to the monolinguals.

Analysis of the phonological picture-onset N400 mean amplitudes revealed no main effect of language group,  $F(1, 43) = 2.59$ ,  $p = .12$ , distractor type,  $F < 1$ , or language group by distractor type interaction,  $F < 1$ . Analysis of the 1150–1300 ms time window representing the auditory-onset N400 showed a main effect of distractor type,  $F(1, 43) = 4.18$ ,  $p < .05$ ,  $\eta^2 = .09$ , in which there was a larger amplitude for the phonological condition than for the unrelated condition. There was no main effect of language group or interaction of language group by distractor type,  $F_s < 1$ . Thus for phonological distractors, there was no impact of the shared phonology during the picture-onset; however both groups required greater cognitive effort, as evidenced by larger N400s, to differentiate the target from the phonological distractor once the auditory cue was presented.

#### 4.3. Discussion

The behavioral results in this study replicated the patterns found in the first two studies showing longer RTs and more errors for semantically-related than for phonologically-related pairs and for phonologically-related pairs than for unrelated pairs. Moreover, by modifying the task to create a delay between presentation of the pictures and the auditory cue, the locus of the semantic processing differences observed in Studies 1 and 2 could be attributed to the integration of the two pictures with the auditory cue, since both bilinguals and monolinguals exhibited N400 attenuation in response to semantically-related pictures. The longer SOA also increased the degree of phonological competition, leading to greater negativity on the auditory-onset N400 in the phonological condition relative to the unrelated condition.

Significant electrophysiological effects were found for both the picture-onset N400 and auditory-onset N400. For the picture-onset N400, monolinguals and bilinguals exhibited attenuation of the N400 in the semantically-related condition, indicating semantic integration of the pictures. Thus, it is likely that the group differences observed in the N400 in Studies 1 and 2 reflected the need to further integrate the pictures with the concurrently-presented word. The results in Study 3 are consistent with the N400 attenuation that Kotz (1997) observed for bilinguals when an 800 ms SOA was inserted between semantically-related stimuli. Taken together, these results suggest that when the processing demands associated with simultaneous pictorial and auditory processing are reduced, bilingual semantic processing is similar to that of monolingual processing.

For the picture-onset, there was no effect of the phonological distractor in the electrophysiological data, suggesting that participants were not immediately identifying the phonological relationship between the pictures. However, once the auditory cue was presented, the phonological condition produced larger N400s than the unrelated condition, indicating that more processing was necessary to distinguish between pictures that share onsets. Importantly, in this condition the listener must wait for the word to unfold for the uniqueness point (e.g., monkey vs. money) to be reached before determining which picture is the target. Additionally, the 800 ms SOA enabled participants to identify both picture names and hold them in memory while waiting for the auditory cue. The larger N400 after the auditory cue in the phonological distractor condition suggests that this manipulation resulted in increased phonological competition. This result is consistent with work by Desroches et al. (2009) who found that when an auditory cue mismatched a single picture, larger N400s were observed for onset mismatches than for unrelated mismatches. Although it is surprising that no language group differences were observed at the electrophysiological level in either Study 2 or 3 during initial word processing, these results are consistent with Blumenfeld and Marian (2011) who only observed group differences in the follow-up probe task after word processing had occurred.

## 5. General discussion

The main question motivating the study was to determine whether lexical selection by monolinguals, for example choosing between “cup” or “mug”, was based on similar processing as used in bilingual selection across languages, for example saying “cup” or “tasse”. The intention was to investigate the uniqueness of the cross-language situation for bilinguals to provide support for the plausibility of its role in underlying the advantages found for bilinguals in other forms of conflict resolution. Since only bilinguals experience cross-language conflict, the question could only be studied indirectly by comparing monolinguals and bilinguals within the same language. The reasoning was that if the selection among competitors within a language was performed similarly by monolinguals and bilinguals, then the unique situation of cross-language selection for bilinguals was unlikely to serve as an explanation for bilingual advantages in nonverbal executive control because the same outcomes should be available to monolinguals as a consequence of the choices made for within-language competitors.

To investigate this question, a novel paradigm was developed and three main findings were observed. First, both bilinguals and monolinguals were slower to identify the target picture in the presence of related distractors than an unrelated distractor, with the longest response times observed to targets in the presence of semantically-related lures. Second, despite comparable behavioral responses, only the monolinguals exhibited reduction in the N400 amplitude for semantically-related pictures, indicating they were integrating the relationship between the pictures and auditory cue (Studies 1 and 2). The bilinguals, in contrast, produced no differences in the N400 amplitude for trials in which the pictures were semantically related and unrelated (Studies 1 and 2). Third, when an 800 ms SOA was inserted between the pictures and the auditory cue, both bilinguals and monolinguals produced evidence for semantic integration in the picture-onset N400 and exhibited greater negativity in the phonological condition in the auditory-onset N400 (Study 3). Importantly, the speed with which listeners must contend with linguistic labels during natural language use is more similar to the timing used in Studies 1 and 2 than the artificial delay used in Study 3, supporting the interpretation that competition for concurrent selection is different for monolinguals and bilinguals during natural language processing.

The precise mechanisms responsible for the observed differences in the selection processes are not fully understood. Nonetheless, Studies 1 and 2 provide insight into the role of the relation between the languages and English language proficiency. Since the two studies produced similar results, it seems unlikely that these two variables meaningfully impacted the pattern of results. In both studies, bilinguals showed no attenuation from semantic relatedness, and in Study 2, bilinguals did not differ significantly from the monolinguals on English vocabulary knowledge, ruling out English proficiency as an explanation.

Our interpretation is that the joint activation of languages for bilinguals means they have more options to consider when making simple lexical choices than do monolinguals. For monolinguals, selecting between two semantically-related pictures to match a word that named one of them showed a reduction in N400 amplitude, the signature of reduced conflict, but for bilinguals, the conflict remained. This failure to integrate semantically-related stimuli reflects greater conflict and potentially the need to recruit greater EC. Our interpretation is that the presented word left outstanding lexical possibilities, presumably those from the other language, so complete integration was not possible. Removing the word and asking participants only to evaluate two pictures, in contrast, produced similar results for everyone – if there was a conceptual relationship between the pictures there was a reduction in the N400. Similarly, Gollan et al. (2005) found no language group differences on a simple semantic classification task based on pictures, but bilinguals were slower than monolinguals when required to assign labels to the pictures. Thus, these results are consistent with the assertions from language models that bilinguals have a shared language-independent conceptual store (e.g., Dijkstra and van Heuven, 2002 and Kroll and Stewart, 1994) and that semantic processing in the absence of language does not differ for monolinguals and bilinguals. Evidence for greater conflict for bilinguals during language processing is consistent with the possibility that this ongoing management of lexical conflict distinguishes monolinguals from bilinguals and may in turn be at least part of the

mechanism by which conflict resolution in bilinguals is enhanced, even for nonverbal tasks. We acknowledge that our results provide only indirect evidence for this claim but the convergence of the results and the theoretical predictions make the interpretation plausible.

In sum, the present evidence shows clear differences in how monolinguals and bilinguals make simple choices in a single language. These differences are consistent with explanations of enhanced bilingual performance in nonverbal conflict tasks that trace the source to the constant conflict that is part of bilingual language use. Thus, choosing between “cup” and “mug” for a monolingual is not an analog of what bilinguals do every time they choose a word to speak where the options represent different languages. Therefore, the routine selection choices made by monolinguals have no implications for the enhancement of executive control.

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## Richard Y. Bourhis (Ed.): Decline and Prospects of the English-Speaking Communities of Quebec

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This edited volume is presented as a research report following on from a conference in 2008 at the Université de Montréal at which some of the papers were presented. As its title indicates, the volume focuses on wide-ranging issues surrounding English speakers in Quebec which constitutes a well-explored context for the study of language policy and planning. In particular, following the passing of Quebec's Charter of the French Language in 1977 (Bill 101), French became the official language of communication at various levels within the province, while Canada's Official Languages Act (1969/1988) assigned equal status to French and English. While English mother-tongue speakers accounted for 13.1 % of Quebec's population in 1971, large numbers of these speakers left the province following the adoption of the Charter. The proportion of English mother-tongue speakers now accounts for 8.3 % of Quebec's population (Canadian census, 2011), while French mother-tongue speakers make up 78.9 %, compared to 80.7 % in 1971. Speakers with another mother tongue (immigrant or aboriginal language) account today for 12.8 %. Constituting a linguistic minority group within the province, English speakers are nonetheless a significant majority group at pan-Canadian level and within North America as a whole, where French mother-tongue speakers respectively make up 22 % and 2 % of the population.

In the context of such a decrease in the Anglophone population within the province, the papers presented in this volume offer fascinating insights into the wide-ranging issues facing the Anglophone community against the backdrop of the status of French in contemporary Quebec. Made up of ten chapters, the volume is extensive in the scope of the themes covered. After a short preface, the volume opens with a chapter by Richard Y. Bourhis and Rodrigue Landry on 'Group vitality, cultural autonomy and the wellness of language minorities.' This chapter provides an interesting means of considering the impact of demographic and institutional factors on a minority group's well-being, by presenting two models within the well-known linguistic vitality framework, namely the Linguistic Vitality Model and the Cultural Autonomy Model.

In the second chapter, Pierre Foucher looks at the legal status of English-speaking communities in Quebec. In particular, he focuses on their language rights in relation to provisions for minority-language speakers at the federal level, and provisions within Quebec's Charter of the French Language for use of English in certain contexts such as health and access to education through English. He then considers such rights within the context of human rights enshrined in Canada's constitution. The chapter concludes with some recommendations, the author favouring an approach based on collective rights rather than the individual's freedom of choice of language, "since it is the collectivity, not the language, that is at risk" (p. 72), while also stressing the importance of support for community institutions.

The subsequent two chapters explore demographic and socio-economic issues. Drawing on extensive demographic data, Jack Jedwab explores the question of who constitutes an English-speaking Quebecer in the context of multiple perspectives on how to define such a speaker, such as in relation to holding English as a mother tongue, knowledge of English, and using English in the workplace, but also social identification, sense of belonging, immigration and mixed marriages. The following chapter by William Floch and Joanne Pocock focuses on the socio-economic status of

the English-speaking community in the context of large-scale Anglophone provincial migration since the passing of the Charter in 1977 at a time when this community constituted an elite minority group in contrast to the socio-economic characteristics of the Francophone majority group. The data are presented by means of a Francophone vs. Anglophone comparison within Quebec as well as in relation to Anglophone data for the rest of Canada in terms of indices such as unemployment rates, income levels, employment activity and educational achievement.

The following four chapters look at issues underlying experiences in everyday life, such as access to education, health and social services, artistic and cultural outlets, and community representation. In her chapter, Patricia Lamarre presents a comprehensive overview of educational issues, such as historical changes in access to English-language schools, and the challenges facing such schools especially outside Montreal, as well as at a post-secondary level. James Carter focuses on Quebec's health and social services and the provisions made for access through English. The chapter especially provides historical and inter-provincial insights, while offering some recommendations for the future. Guy Rodgers, Jane Needles and Rachel Garber offer wide-ranging insights into artistic and cultural vitality. They especially compare the situation in Montreal to the rest of Quebec, as well as the situation in different areas of the arts and culture, such as linguistic and non-linguistic domains, leisure activities and the media. Jack Jedwab and Hugh Maynard look at institutional and community representation, a key issue for English-speaking advocacy.

The volume concludes with an extensive chapter by Richard Y. Bourhis on social psychological issues, collating wide-ranging results of studies exploring the vitality underlying the English-speaking community. There follows a concluding chapter with three views presented by Victor Goldbloom and Graham Fraser, respectively a former and current Commissioner of Official Languages in Canada, and André Pratte, a well-known Quebec journalist.

As a whole, this volume is expertly edited, while each chapter further evidences the exceptional expertise of its author(s). This is an extremely comprehensive volume, and an important one given the multiple insights that it offers into Quebec's English-speaking communities. Those insights, and the recommendations that some authors provide, highlight the key issues that will necessarily impact future discussion at provincial and federal levels about the English-speaking communities in the province.

An electronic copy of the book can be downloaded for free from: <http://123.233.119.36:80/rwt/154/http/publications.gc.ca>.

# A Comparison of the Classroom Management Approaches of the Teachers Implementing “Constructivist Learning Approach” and not Implementing this Approach

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**Abstract.** In this study, in the academic year 2005 – 2006, the approaches to classroom management in the Turkish lessons between the class teachers implementing the curriculum based on the “Constructivist Learning Approach” in the 1st – 5th grades of primary school and the Turkish branch teachers who have not yet started to implement the curriculum based on the “Constructivist Learning Approach” in the 6th – 8th grades and who is still implementing the “Behaviourist Learning Approach” was compared and the effects of these approaches on the primary school teachers’ attitudes towards classroom management was analyzed.

**Keywords:** Constructivist learning approach; behaviourist learning approach; classroom management; classroom organization; multiple intelligence.

## 1. Introduction

Constructivism is a learning approach where the students construct their own knowledge and mental models as a result of their own experiences and thinking by means of interacting with their environments (Gagnon, et al., 2006). A way of learning and knowing, constructivism suggests that knowledge is built on the learners’ experiences and lives by the students themselves. In this sense, the students, themselves, form and construct the new knowledge that they come across in the light of their existing knowledge and experiences. Constructivism is to shape new learning by means of relating the new knowledge with the previous one (Sherman & Kurshan, 2005). To this approach, learning is an active process, and the students produce new meanings by connecting their new thoughts with their previous knowledge (Naylor & Keogh, 1999). Brooks & Brooks (1993) puts forward that constructivism is not a teaching theory but a learning theory.

According to Perkins (1995), constructivism started to develop as an approach related to how learners learn “Constructivist Learning Approach” is the transfer of knowledge and its re-construction (Sasan, 2002).

The classic and traditional teaching approach which has been implemented in our schools sets an important obstacle against developing convenient citizens for update conditions (Demircioslu, 2005). Hence, Ministry of National Education (MEB) gave up programmes based on “Behaviourist Learning Approach” gradually and has been implementing teaching programmes based on “Constructivist Learning Approach” since 2005. As qualified teaching programmes are required for qualified education, qualified teachers are required and prerequisite for qualified teaching programmes. “Constructivist Learning Approach” sets the role of being counselor of the activities in the classroom for teachers by means of changing the understanding of teacher-centred classroom management along with teacher-centred teaching process. This has changed the roles of teachers in classroom. To Selley (1999; cited in Yıldırım&Dönmez, 2008), constructivist teachers have a role as providers of appropriate learning experiences and going on learning with their pupils instead of being open

minded, capable of renewing themselves, taking into consideration personal differences, and transferring knowledge. The students' taking part in the classroom management will help the concept of "Interactive Management in the Classroom" emerge and develop instead of "Classroom Management".

The knowledge, skills and attitudes that teachers as classroom managers have and their reflections affect, first, their own students, and then, school administration, parents and school environment. As schools are in first place in the educational ranking, classrooms are in first place of schools. Hence, teachers as classroom managers should have particular qualifications and skills so that they can be successful.

Having gains and their reinforcement, which are the short-term objectives of education starts in classrooms. It can be said that there is a positive relationship between the qualifications of classroom management and educational management. Basar (1999) puts forward that the quality of educational management mainly depends on the quality of classroom management.

Attitudes towards the field form the basis of the behaviours of teachers concerning classroom management. That is why it is natural that the focus of the shift meant in the teacher behaviours in accordance with classroom management is shaped by teacher attitudes (Çaslar, 2004).

Classroom is a common living environment where educational activities take place. Most of students' and teachers' time passes through this common living environment. It is the teacher who is the first to have the responsibility for the emergence of in-class experience in accordance with the pre-determined objectives. In other words, it is the teacher's responsibility to adjust and manage the learning environment and experiences in classroom (Aydsn, 1998). According to Vural (2004), innovations in the educational technology bring in new perspectives to the learning environment. These innovations facilitate the learning environment. Thus, teachers should be able to utilize educational technologies efficiently and productively in order that they can be more successful.

Ginn (1996) suggests that classroom should be re-organized in a way that students can walk through and get materials easily without disturbing the others. By means of providing students with opportunities to be able to go on discovering at home, research and activities can be pursued out-of-school. This helps parents participate actively in the students' learning and improvement process. In addition, students should also be led to exchange ideas in classroom, and test their thoughts. These debates help students take their studies and understanding construction.

This study, aiming at evaluating the classroom organization approaches of the class teachers implementing the "Constructivist Learning Approach", seeks answers to the following questions: Is there a difference between the classroom management approaches of class teachers implementing "Constructivist Learning Approach" and those of Turkish branch teachers not implementing it? Under this main problem statement, the following questions are tried to be answered:

Is there a difference between the perceptions of teachers implementing "Constructivist Learning Approach" towards managing classroom and those of branch teachers not implementing it?

Is there a difference between the perceptions of class teachers concerning managing their classrooms and the perceptions of students concerning the way of their teachers' managing classroom?

Is there a difference between the perceptions of branch teachers towards classroom management and the perceptions of students towards their teachers' way of managing classroom?

Does the socio-economic environment surrounding school affect the implementation of "Constructivist Learning Approach"?

## 2. Method

### 2.1. Research Model

This study is an applicative, field-oriented and descriptive survey. It investigates in what way teaching programmes based on "Constructivist Learning Approach" which started in the academic year 2005–2006 with changes in the then-existing teaching programmes affect class teachers' perceptions towards classroom management. For this reason, it aims to highlight the perceptions of primary school (Stage 1) class teachers and (Stage 2) Turkish branch teachers.

Table 1. Numbers of the class teachers and Turkish branch teachers in Sahinbey and Sehitkamil

	N of Primary Schools	N of Class teachers	N of Turkish Branch Teachers	N of students in Total
Sahinbey	135	1.922	200	126.270
Sehitkâmil	140	1.512	163	101.187
Total	275	3.434	363	227.457

3.434 class teachers and 363 Turkish branch teachers work in Sahinbey and Sehitkâmil, Gaziantep (Table 1).

Table 2. The Analysis of the Participants' Perceptions Towards Whether There are Significant Differences Between the Groups Concerning the All Dimensions

DIMENSIONS (+ There are Statistically Significant Differences) (-There are not Statistically Significant Differences)	RESULTS OF T-TEST			Results of Kruskal Wallis-H Test / One-Way Variance Analysis (ANOVA) Economic Level Low SEL :E1 Moderate SEL:E2 High SEL :E3
	Class Teacher Turkish Teacher	Stage I Students Class teacher	Stage II Students Turkish Teacher	
<b>DIMENSION 1:</b> Classroom Organization	+	-	+	(+) L-H/L-M/M-H
<b>DIMENSION 2:</b> Learning Climate	-	-	+	(+) L-H/L-M/M-H
<b>DIMENSION 3:</b> Learning Process and Its Evaluation	+	-	+	(+) L-H/L-M/M-H
<b>DIMENSION 4:</b> Utilizing Educational Technologies and out-of-School Learning Environment	+	+	+	(+) L-H/L-M/M-H
<b>DIMENSION 5:</b> Multiple Intelligence Areas	+	-	+	(+) L-H/L-M/M-H
<b>DIMENSION 6:</b> Learning by Doing and Experiencing	-	+	+	(+) L-H/L-M/M-H
<b>DIMENSION 7:</b> Questioning What is Learned	-	-	+	(+) L-H/L-M/M-H
<b>DIMENSION 8:</b> Student Development	+	-	+	(+) L-H/L-M/M-H

## 2.2. Sampling

The teachers and the students in the primary schools in Sahinbey and Sehitkamil, Gaziantep, in the academic year 2006–2007 form the population of the study.

In academic year 2006–2007, there were 275 primary school shaping the population of the study. In these schools were 3.434 class teachers and 363 Turkish branch teachers along with 227.457 students. In other words, the population of the study incorporates 3.797 teachers and 227.457 students. The sampling of the study was done as ranking sampling. The ranking sampling requires division of the population into sub-groups first (Arseven, 1993, s.100). Aiming this, the population was first divided into sub-groups as independent variables of class teachers, Turkish branch teachers, classroom level (Stage 1 and Stage 2) and socio-economic level. While selecting sampling from the teacher and student populations, ratio sampling was employed.

In accordance with the neutrality principle, among 275 primary schools in Sahinbey and Sehitkamil, the connecting schools for the neighbourhoods without schools and the schools with combined classrooms were excluded. Of the other schools along with 147 central primary schools, in

accordance with their “Socio-Economic Level (SEL)”, 34 High SEL, 33 Moderate SEL and 33 Low SEL, which means 100 primary schools in total, were selected. From each one of these schools, 2 class teachers, 2 Turkish branch teachers, which means 400 teachers altogether, were determined. Two students chosen from each classroom level (Stage 1 and Stage 2), which means 12 students from each school, were included into the study. In total, there were 1200 students forming the sampling of the study.

### 3. Results (Findings)

The findings of the research were dealt with in a way about the subject. They were divided into eight subjects which are related to the classroom management dimension obtained through the factor analysis implemented to the answers to the “Constructivist Learning Approach Instrument”.

This study aims at comparing the the classroom management approaches of class teachers implementing “Constructivist Learning Approach” and those of Turkish branch teachers not implementing it. The results obtained are showed in accordance with the sub-problems of the study as follows (Table 2).

### 4. Discussion

It can be mentioned that class teachers implementing “Constructivist Learning Approach” in their classrooms carry out activities in their lessons in accordance with all the dimensions highlighted in this study, and that the thoughts of the (Stage I) students also support this.

Although Turkish branch teachers pursuing lessons in accordance with “Behaviourist Learning Approach” in their classrooms claim that they take into consideration all the dimensions mentioned in this study, their (Stage II) students disagree with them.

Students and teachers put forward that all the dimensions of “Constructivist Learning Approach” dealt with in this study are implemented more in primary school with High SEL than in the ones with Moderate and Low SEL. These findings suggest that “Constructivist Learning Approach”, in general, can be implemented better in schools with good opportunities.

The findings given above and the semi-constructed observations carried out in the classrooms show that when the two approaches are compared in terms of the applications in the all dimension of classroom management, it is clear that “Constructivist Learning Approach” includes more applications than “Behaviourist Learning Approach”.

### 5. Conclusion and Recommendation

As a result, the comparison of the attitudes towards the classroom management of the class teachers who implemented “Constructivist Learning Approach” in the Turkish lessons and that of the branch teachers not implementing this approach revealed that, in general, in respect of classroom management applications, and in specific mean, in respect of Classroom Organization, Learning Climate, Learning Duration and its Evaluation, Using Educational Technology and Learning Environment out-of-School, Multiple Intelligence Areas, Learning by Implementation, Questioning Learning, Student Growth, the former were superior to the latter.

The recommendations of this study concerning the research findings and conclusion are as follows:

- Ministry of National Education (MEB) held an in-service training programme for teachers and administrators for a short time before shifting into “Constructivist Learning Approach”-based curriculum. This kind of in-service training programmes should be carried out periodically.
- Although beneficial, instead of this kind of short-lasting educational events peculiar to the transition duration, the students should be provided with a more serious and longer training in the faculties of education. In this training, “Constructivist Learning Approach” should be introduced in details.

- In the curriculum of “Classroom Management”, one of the obligatory courses in the faculties of education, how to manage a classroom in accordance with “Constructivist Learning Approach” should be emphasized.

- Ministry of National Education should evaluate all kinds of feedbacks from applications concerning “Constructivist Learning Approach” and make use of them while developing the system.

- In all types of schools, the cabinet system which will make it possible to employ activities of learning by doing and experiencing which form the basis of “Constructivist Learning Approach” should be urgently activated. Such kind of an application is supposed to make it easy for teachers to manage classrooms since it will greatly prevent students from misbehaving.

## 6. Implications for further research

Ultimately, this systematic literature review on the inclusion of students with disabilities in PE from a teacher perspective highlighted the following:

- the factors that influence PE teachers' positive or negative attitudes and predispositions toward the inclusion of students with disabilities,

- the factors that can positively influence the inclusion of students with disabilities in PE classes, according to teachers' representations.

From this set of factors, we identified three types of training content to help PE teachers become more inclusive and accessible in their teaching. This training content forms the basis of the following research perspectives.

Regarding multidisciplinary training, it would be interesting to conduct a study to compare the representations and attitudes of PE teachers and those of their colleagues that teach other subjects. A quantitative study in the form of survey could be considered.

Regarding disciplinary didactic training, it would be important to investigate PE teachers' points of view regarding the changes and differentiations in their teaching content and didactic choices (disabled sports programming, modifications of traditional sports, individual goals, etc.) that they find necessary to ensure the participation of children with disabilities in their course. A qualitative approach involving interviews after the teachers are given descriptions of different students with disabilities (for example, their age and the type and severity of their disability) could help the teachers share their points of view and justify their educational choices.

Finally, regarding pedagogical disciplinary training, it would be interesting to observe the different types of instruction (classroom climate, style of intervention, the use of cooperative learning, the use of peer tutoring, etc.) that PE teachers have available to implement. Multiple case studies with observations and postsession interviews could add rich information for analysing teaching practices.

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$$c^2 = a^2 + b^2. \quad (1)$$

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