Identifying disputants' attitudinal variations in family mediations: A data mining approach

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Abstract

This article combines linguistic analysis and data mining methods to explore variations in speakers' evaluative meaning-making in conflict talks. It focuses on conflict style construction through evaluative language, specifically *how disputants advance attitudes*. The corpus consists of 230 minutes of family mediation talks involving 12 divorcing spouses. The research draws from the Appraisal framework to analyse evaluative meaning-making at a discourse semantics level, capturing both explicit and implicit attitudes, as well as the scaling and dialogic framing of attitudes. Data exploration uses clustering algorithms via RStudio to identify variations in disputants' discursive behaviour. The findings uncover three conflict styles based on disputants' preference for attitude advancement formulations, with varying degrees of assertiveness and forcefulness. This study's contributions include a holistic treatment of evaluative meaning-making, the marriage of digital tools to nuanced linguistic annotation, and a novel interpretation for conflict style. The findings offer fresh insights into disputants' discursive self-presentation in confrontational exchanges.

Keywords

Appraisal, attitude, clustering, conflict, discourse analysis, evaluation, R, sentiment analysis, style

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Introduction

It is generally acknowledged that people involved in conflicts behave differently. They have 'patterned responses, or clusters of behaviour' defined as 'conflict styles' (Hocker and Wilmot, 2018: 152). Research in conflict resolution has explored different approaches people use to handle conflicts. For example, the Thomas-Kilmann Conflict Mode Instrument identifies five primary conflict styles: competing, collaborating, compromising, avoiding and accommodating (Thomas, 1992; Thomas and Kilmann, 1978). Similarly, the Dual Concern Model proposes two underlying concerns of conflict styles – concern for self (assertiveness) and concern for others (cooperativeness) (Pruitt and Carnevale, 1993). These conflict-style taxonomies indicate significant behavioural variation among individuals engaged in conflicts. However, existing studies primarily rely on researcher observation, surveys or reflective interviews rather than analysing variations in disputants' language use during disputes. This study aims to provide new insights into conflict styles by adopting a discourse analytical perspective and focusing on patterned variations in disputants' use of evaluative language in family mediations.

Family mediation exchange offers valuable insights into discursive style construction. These exchanges involve immediately interactive multiparty spoken discourse, leading to the emergence of disputes or conflicts (Oetzel and Ting-Toomey, 2013; Stewart and Maxwell, 2010). Patterns in the disputants' language use reveal the contingency of dispute resolution and the formation of conflict styles (Garcia, 2019; Greatbatch and Dingwall, 1997; Keck and Samp, 2007; Speakman and Ryals, 2010). In family mediations, the construction of 'reality' is entirely shaped by the disputants' discursive performance, including their narratives of past events, evaluations of the self and others, and sometimes explicit articulations of values and beliefs. The particular aspects of the 'self' performed by the disputing spouses guide and influence the impressions of mediators and mediation outcomes. However, despite extensive research on the discursive identity construction of mediators (Donohue and Liang, 2011; Garcia, 2012, 2019; Zhang and Dong, 2023), patterns in disputants' discursive self-presentation remain underexplored.

Against this background, this research examines the disputants' discursive construction of conflict styles by systematically exploring variations in their deployment of evaluative meaning-making resources. Evaluative meaning-making concerns how language is used to convey and source attitudes, and how interactants align with those attitudes (White, 2015). During dispute resolution, the expression of attitudes by disputants plays a crucial role in facilitating effective communication, emotional release, identification of interests, and collaborative decision-making (Jameson et al., 2010). This research utilizes Chinese televised mediations as data, showcasing real-life conflict interactions among disputing spouses. Research questions revolve around exploring variations in the attitudinal expressions of multiple disputants and the discursive construction of attitudinal conflict styles. For instance, do all disputing spouses exhibit a similar degree of negativity towards their counterparts, indicating an antagonistic style? Do some also express positive assessments of the opponent or self-criticism, suggesting a reconciliatory style? Furthermore, can clustered attitudinal arrangements be identified among multiple disputants? If so, what insights can be derived from patterned variations in their discursive self-presentation? These inquiries move beyond simplistic text classification as positive or negative sentiments, a mainstream approach in computational Sentiment Analysis

(Birjali et al., 2021; Li et al., 2020; Liu, 2020). Additionally, these inquiries contribute to the textual attitudinal identity studies by expanding the focus from English written texts in printed or social media (Cavasso and Taboada, 2021; Inwood and Zappavigna, 2023; White, 2012) to non-English, interactive, multiparty spoken data.

To address these objectives, the study adopts the Appraisal framework (Martin and White, 2005) as the linguistic annotation scheme and employs clustering algorithms in R^1 to identify distinct groups and latent dimensions in the disputants' use of evaluative language. By combining nuanced linguistic analysis and computational tools, this research resides at the nexus of discourse studies and digital humanities. It strives to surpass the mere automation of transcription processes and conducts a nuanced linguistic analysis to potentially uncover new information about how disputants present themselves in the family mediation context. The study's contributions, compared to existing projects analysing attitudinally charged language, lie in: (1) the application of a linguistic theory-based analytical framework to systematically track variations in attitudinal meaning-making, specifically *how disputants evaluate specific targets* in the text data, rather than solely focusing on positive or negative sentiments; (2) the utilization of clustering algorithms to identify patterns in multidimensional data, moving beyond descriptive statistics that only report frequency lists of linguistic features; and (3) the classification of three distinct conflict styles based on the disputants' manipulation of evaluative language.

Evaluative meaning-making and textual identity

Among various approaches to the evaluative, such as stance, and stance-taking and modality, this research follows the theoretical account of evaluative meaning-making as set out by the Appraisal framework (Iedema et al., 1994; Martin, 2000; Martin and White, 2005; White, 1998, 2003). Appraisal conceptualizes evaluative meaning-making as one of the interpersonal functionalities of language. It also provides a systematic account of evaluative meaning-making resources by taxonomizing them into three systems: ATTITUDE, ENGAGEMENT and GRADUATION, addressing different aspects of the linguistic configuration of evaluation. ATTITUDE is concerned with positive or negative assessments conveyed (i.e., via inscription) or activated (i.e., via invocation). It broadly distinguishes three types of assessments: emotional response (termed 'Affect'), evaluation of behaviour and character (termed 'Judgement') and evaluation of things, processes and situations (termed 'Appreciation'). ENGAGEMENT addresses the issue of dialogic positioning and the negotiation of heteroglossic diversity. It offers several levels of distinction regarding the degree of heteroglossic diversity allowed in the text (e.g., 'monogloss' or 'heterogloss'). Finally, GRADUATION deals with the resources for scaling the attitude or engagement options in terms of intensity or prototypicality.

Appraisal frames evaluative meaning-making resources as operating on the 'discourse semantic' level, focusing on the 'text oriented resources for meaning' (Martin, 1992: 1) rather than wording choices. This meaning-oriented approach provides a new perspective to existing discursive identity studies, which mostly focus on linguistic variations at the lexicogrammatical level, such as vowel change, consonant cluster reduction, the final and preconsonantal, nominal suffixes, to name just a few (Chambers et al., 2013; Eckert, 2000; Wolfram, 2017). Compared to other frameworks like stance and stance-taking (Du

Bois, 2007; Du Bois and Kärkkäinen, 2012; Jaffe, 2009; Kiesling et al., 2018), the Appraisal taxonomies offer a more comprehensive and systematic treatment of the evaluative meaning-making. Consequently, the analysis presented in this article orients towards resources for meaning over resources for wording.

Utilizing the Appraisal framework, researchers have extensively discussed the construction of affiliation and communal identity through shared values (Inwood and Zappavigna, 2021, 2023; Knight, 2013; Martin, 2010; Tann, 2012; Zappavigna and Martin, 2018). Of particular relevance to the current research is the Appraisal scholarship concerning textual identity construction. This body of scholarship analyses discursive self-presentation and variations by tracking tendencies in speakers/writers' deployment of the evaluative meaning-making resources, particularly attitudinal resources. Previous research has characterized textually performed identity in various text types, including movie reviews, youth justice conferencing, casual conversation, online chats and academic writing (Don, 2007; Eggins and Slade, 1997; Hood, 2012; White, 2008, 2020; Zappavigna and Martin, 2018). Additionally, a few studies have developed accounts of different textual identity types, such as 'evaluative keys' associated with journalistic roles (Martin and White, 2005; White, 1998), 'voices' in academic writing (Hood, 2010, 2012), patterned choices in secondary school historical discourse (Coffin, 2006) and 'attitudinal dispositions' for email list posters (Don, 2007, 2016). These studies have demonstrated that patterns in the speakers/writers' use of Appraisal resources, particularly attitudinal meaning-making resources, 'can be related to particular rhetorical effects and construct particular authorial identities or personas' (Martin and White, 2005: 161). None of the prior work, however, has investigated discursive identity construction for multiple speakers in immediately interactive, adversarial, and multiparty spoken discourse.

It is notable that the study presented in this article extends previous Appraisal-based projects by not only focusing on the types of attitudes favoured by disputants but also extending the analysis to *how they advance their attitudes*. Specifically, previous studies have only examined speaker variations regarding their preference for certain attitudes (Cavasso and Taboada, 2021; Jing and Xu, 2023; Xu and Jing, 2024; Xu and White, 2021) or tracked the 'coupling' – the co-occurrence of an ideational entity and an evaluation – in the text (Zappavigna and Dreyfus, 2022; Zappavigna et al., 2008). In contrast, this study takes a holistic view of attitude by considering the combination of 'attitude type + target + polarity' as one 'attitudinal complex' (Xu and White, 2021). This treatment allows for identifying patterns in *how* disputing spouses express their attitudes. In other words, this study examines whether attitudes are intensified, mitigated, categorically asserted or modalized. Consider the following expression of condemnation by a wife: 'My husband crosses the line.' While the same attitudinal proposition could be presented in various ways, such as 'My husband *always* crosses the line', '*I have the feeling that* my husband has crossed the line' or '*It's beyond doubt that* my husband has crossed the line', these different formulations entail varying degrees of the wife's authorial involvement in advancing the attitude and openness to negotiating the attitude being expressed.

Identifying evaluative meaning-making patterns

Besides the theoretical contributions outlined above, the study breaks new grounds by implementing an innovative data processing pipeline. The proposed methodology draws

on insights from the two distinct approaches to evaluative language analysis, offering a solution to the existing methodological challenge. One methodology is informed by the linguistic framework of Appraisal, which, as illustrated in the previous section, provides a means to capture the nuanced mechanisms of attitudinal meaning-making in text. This method holds potential for addressing the issues of validity and reliability inherent in computational coding. The other methodology relies on computational tools to automatically identify and analyse patterns of evaluative language in text data, falling under the umbrella term of Sentiment Analysis or Opinion Mining (Birjali et al., 2021; Breck and Cardie, 2014; Liu, 2020). Numerous computational approaches have been developed, including lexicon-based methods (Biagini et al., 2023; Li et al., 2020; Taboada et al., 2011) and machine learning and Natural Language Processing techniques (Muhammad et al., 2016; Thompson et al., 2017). These computational methods enable the identification and categorization of opinions expressed in a text, especially in determining whether a document or sentence expresses a positive, negative or neutral opinion towards a particular entity or an aspect of the entity.

Both approaches have their strengths and limitations when dealing with evaluative language in text, giving rise to a trade-off between annotation delicacy and data size (Bednarek, 2008; Fuoli, 2018; Halliday and Matthiessen, 2014). Specifically, computational approaches offer broad applicability for identifying and analysing evaluative language patterns across domains. However, they face challenges in handling evaluations involving contextual ambiguity and domain-specific knowledge (Chan et al., 2021; Van Atteveldt et al., 2021, 2022). Meanwhile, Appraisal-based studies can uncover implicit sentiments embedded within texts and provide a comprehensive and highly nuanced profile of attitude-related resources at the discourse semantics level. Nevertheless, they often struggle with scalability and replicability due to the reliance on manual pattern recognition. In response to this trade-off, the present study aims to explore the possibilities for integrating a linguistics-informed annotation system with computational tools. By embracing a human-computer integrated research method, this study leverages the advantages of both methodologies to attain a deeper understanding of the data.

In this research, the programming language *R* is employed to identify Appraisal patterns within the dataset. *R* has gained popularity in digital humanities owing to its statistical analysis and visualization capabilities (Gries, 2021; Wickham and Grolemund, 2017). Previous studies have also utilized *R* to detect Appraisal patterns in diverse datasets. For instance, Cavasso and Taboada (2021) examine variations in attitudinal type and polarity in online news comments; Xu and White (2021), Jing and Xu (2023) explores attitudinal disposition (type, polarity and target) variation patterns in spoken and social media data; and Xu and Xiao (2022) scrutinizes the dialogic positioning patterns in translators' textual identity. Nevertheless, these studies primarily focused on pattern recognition with limited 'attitudinal axes' (White, 2008), lacking a comprehensive treatment of the evaluative meaning-making resources in the dataset.

Dataset

This study obtains data from one Chinese televised family dispute resolution programme – *Gold Medal Mediation* (金牌调解), produced by Jiangxi Satellite TV Network. This program serves as a semi-formal alternative dispute resolution platform for ordinary

Figure 1. Screenshot of the mediation studio.

people to resolve family conflicts through grassroots mediation, and it is legally supported within the Chinese legal system (Hawes and Kong, 2013). Although it is recognized that the interactions might take different forms in private settings, the programme ensures the authenticity of the interactions in resolving genuine family disputes. Each mediation episode features one hostess, two or three disputants, and a mediation panel of seven members, with no live audience present. Figure 1 provides a screenshot of the mediation studio.

During each episode, the disputants openly discuss their conflict issues in front of the mediators, outlining their concerns and grievances, after which the mediators provide advice. The majority of the episodes result in voluntary settlement agreements. Thus, the programme provides spoken language data consisting of complaints, individual perspectives from each disputant, confrontations between the disputants, and feedback and advice from the mediators.

The dataset comprises six episodes of *Gold Medal Mediation*, totalling approximately 230 minutes of video recordings. The 12 disputants in the dataset have comparable demographic characteristics, including age, place of residence and economic background. The demographic features suggest similar socioeconomic status among the disputants, which may influence their beliefs, values and potentially, behaviours. Additionally, all disputants came to the mediation seeking divorce due to one spouse's alleged cheating behaviour, and all six mediations resulted in voluntary settlements. Therefore, the metadata for the 12 disputants differs in two aspects: gender and waywardness. In the subsequent discussions, the allegedly cheating spouse is referred to as 'wayward', while the other is 'aggrieved'. Three episodes feature a wayward husband and an aggrieved wife, while the other three episodes feature a wayward wife and an aggrieved husband.

The video recordings were transcribed in Chinese and then segmented into 'moves' using ELAN, with a 'move' defined as an interpersonal semantic unit of dialogue,

typically realized by a free clause (Martin, 1992). Excerpt 1 exemplifies the transcription and segmentation of the texts. The entire dataset was segmented into 1147 turns and 5282 moves. The transcription, annotation, and code are available on GitHub.[2]

Excerpt I Move as the unit of analysis

Turn	Speaker	Move	Utterance (Chinese)[3]	Utterance (English translation)
64	Wife_W01_ WW	1	聊天是会有	We do have chatted
		2	有聊天	We chatted
		3	有过聊天	We have chatted
		4	但是那些亲密的那些 聊天是没有	But we don't have those flirtatious chats

Methodology

Annotating evaluative language

Figure 2 depicts the annotation scheme and includes examples from the dataset, highlighting lexical items inscribing attitudes in bold. This annotation scheme, following the principles of Appraisal (Martin and White, 2005), categorizes evaluative meaning-making resources into three systems: ATTITUDE, ENGAGEMENT and GRADUATION.

The ATTITUDE system was annotated along four 'attitudinal axes' (White, 2008) – type, target, polarity and explicitness. The 'type' axis broadly distinguishes assessments into three types: Affect, Judgement and Appreciation. This study expands the existing Appraisal framework by classifying two more nuanced Affect types: 'triggered' (authorial emotional response triggered by the antagonist) and 'observed' (reported emotional reaction of the antagonist). A triggered Affect, particularly a triggered negative Affect, serves as a token to ultimately invoke negative Judgement directed at the trigger for having caused the speaker to feel bad. Similarly, an observed Affectual reaction of an emoter has the potential to elicit an attitudinal evaluation directed at either the emoter or the trigger, depending on whether the observed Affect is seen as socially appropriate or inappropriate. Additionally, 'target' records whether the assessment is directed towards the self, the antagonist or others. 'Polarity' is concerned with whether the assessment is 'positive' or 'negative'.

The last axis, 'explicitness', focuses on whether the assessment is explicitly conveyed. This study contributes to the existing literature by systematically tracking attitude explicitness, particularly in relation to invoked attitudes. In conflict talks, authorial attitudes are often implicit and involve inferences rather than being directly determined from explicit expressions in the text. This annotation approach incorporates the proposals made by previous scholars regarding the meaning-making mechanisms of invocations (Don, 2016; Hood and Zhang, 2020; Thompson, 2014; White, 2012). Two types of attitude explicitness were annotated: 'inscribe' and 'invoke'. An inscription is identified when explicit evaluative terminology is used, similar to the wordlist approach in computerized sentiment analysis models. On the other hand, invocations involve the use of other Appraisal values, such as intensifications and counter-expectation assessments, or purely
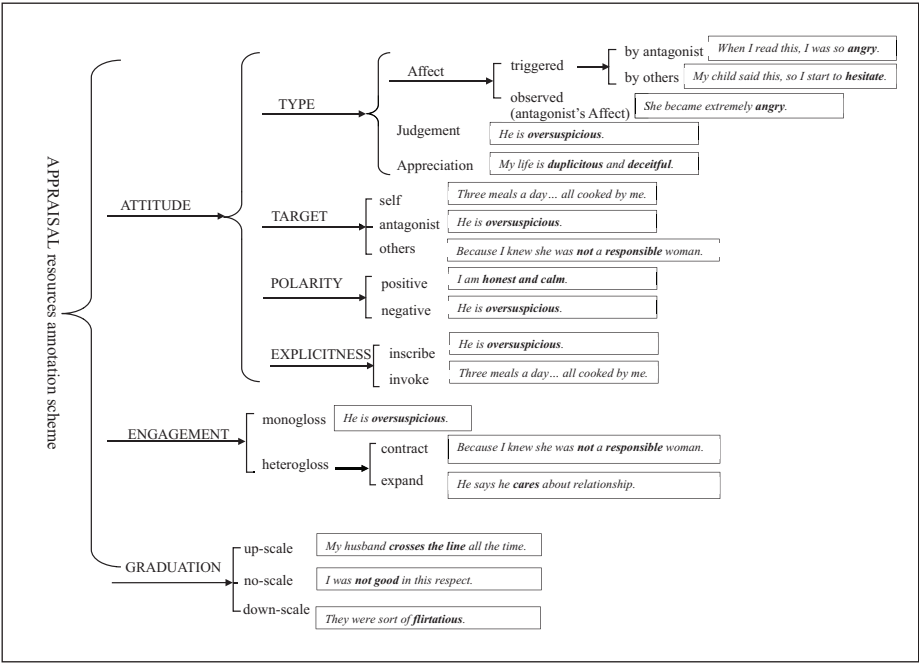
APPRAISAL resources annotation scheme

ATTITUDE

TYPE
- Affect
  - triggered
    - by antagonist — *When I read this, I was so **angry**.*
    - by others — *My child said this, so I start to **hesitate**.*
  - observed (antagonist's Affect) — *She became extremely **angry**.*
- Judgement — *He is **oversuspicious**.*
- Appreciation — *My life is **duplicitous** and **deceitful**.*

TARGET
- self — *Three meals a day... all cooked by me.*
- antagonist — *He is **oversuspicious**.*
- others — *Because I knew she was **not a responsible** woman.*

POLARITY
- positive — *I am **honest and calm**.*
- negative — *He is **oversuspicious**.*

EXPLICITNESS
- inscribe — *He is **oversuspicious**.*
- invoke — *Three meals a day... all cooked by me.*

ENGAGEMENT
- monogloss — *He is **oversuspicious**.*
- heterogloss
  - contract — *Because I knew she was **not a responsible** woman.*
  - expand — *He says he **cares** about relationship.*

GRADUATION
- up-scale — *My husband **crosses the line** all the time.*
- no-scale — *I was **not good** in this respect.*
- down-scale — *They were sort of **flirtatious**.*

Figure 2. Annotation scheme.

experiential tokens. Notably, co-textual cues play a pivotal role in evoking attitudes in family dispute resolutions, as conflictual interactions often involve interruption, overlapping and multiparty exchange. Existing computerized models are unable to track such attitudinal meaning-making. In the annotation process, linguistic formulations indicating an attitude are annotated as 'attitude signal'. A complete list of the attitude signals can be found on GitHub.[2]

In addition to the ATTITUDE system, two framing options are also considered in this study. The first option pertains to how an attitude is dialogically framed, which relates to ENGAGEMENT resources. Three dialogistic framing features are recorded: (1) presenting the attitudinal assessment as a bare assertion ('monogloss'), (2) proclaiming or disclaiming the attitude by fending off alternative assessments ('contract') or (3) recognizing the possibility of alternative attitudinal assessments ('expand'). The second framing option focuses on how an attitude is scaled under resources in GRADUATION. This study categorizes three general scaling tendencies: (1) 'upscale' to intensify the assessment, (2) 'downscale' to mitigate the assessment or (3) 'no-scale' to present the assessment without adding any scaling devices.

After annotating all the attitudinal axes, attitudinal expressions with the same 'attitude type + target + polarity' features were grouped together as one type of 'attitudinal complex' (Jing and Xu, 2023; Xu and White, 2021). By examining the linguistic framing of these attitudinal complexes, we can scrutinize how attitudes are presented. Annotation examples can be found in Table 1.

Table 1. Annotation examples.

Speaker	Turn	Move	Utterance (English translation)	Attitude		Polarity	Explicitness	Signal	Attitudinal complex	Graduation	Engagement
				Type	Target					Scaling	Dialogic framing
Wife_H03_AW	2	2	I feel extremely **uncomfortable**	Affect (triggered: antagonist)	self	−ve	inscribe	inscription	Negative Affect triggered by the antagonist	Upscale	Monogloss
Husband_H02_WH	153	1	I was **not good** in this respect	Judgement	self	−ve	inscribe	inscription	Negative Judgement of the self	No-scale	Contract
Wife_H02_AW	125	1	I was sort of **tolerant** in the past	Judgement	self	+ve	inscribe	inscription	Positive Judgement of the self	Downscale	Monogloss
Husband_W02_AH	61	1	They even stayed in a hotel room	Judgement	antagonist	−ve	invoke	evoke	Negative Judgement of the antagonist	No-scale	Contract

Note: The lexical items inscribing attitudes are highlighted in bold.

Computerized data exploration

Following the nuanced manual annotation, a two-stage data exploration was carried out using various data analysis and clustering packages in RStudio.[4] The first stage aimed to generate an attitudinal profile of the dataset and examine the distribution of attitudinal complexes used by the disputants. This analysis considered the collective preferences of all disputants regarding options in the attitude system.

The second stage focused on identifying variation patterns in how the disputing spouses expressed their attitudes, specifically through the co-selection of options in the three Appraisal systems – ATTITUDE, ENGAGEMENT and GRADUATION. The ATTITUDE system comprises four attitudinal axes (type, target, polarity and explicitness), resulting in 48 inscribed/invoked attitudinal complex options. Additionally, through ENGAGEMENT, three dialogic framing options (monogloss, contract, and expand) and through GRADUATION, three scaling options (upscale, downscale and no-scale) were considered, resulting in a total of 432 framing options. For example, a framing option could be a 'monoglossed (dialogic framing) and upscaled (scaling) inscribed (explicitness) negative (polarity) Judgement (type) of the antagonist (target)'. The second stage aimed to determine whether all 432 framing options were equally preferred by the 12 disputing spouses and involved the following three steps:

(1) Calculating the spouses' preference for each framing option. The degree of preference for framed attitudinal complexes was calculated based on the ratio of each option's occurrences in the disputant's speech. For instance, if a disputant had a total of 100 attitudinal instances and used 'upscaling and contracting' to frame the attitudinal complex of 'inscribed positive Judgement of the self' 10 times, then the ratio for this particular framed complex would be 10% for that disputant.

(2) Determining the optimal number of clusters in the dataset. This step involves identifying the number of clusters in the dataset that maximizes the cohesion within each cluster while also maximizing the separation between clusters, as determined through the average silhouette method (Batool and Hennig, 2021; Kaufman and Rousseeuw, 1990).

(3) Identifying the clusters. Principal Component Analysis (PCA), performed using the 'FactoMineR'[5] and 'factoextra'[6] packages, explored patterns in the disputants' preference for framing options.

Results

Attitudinal profile of the dataset

The initial phase of pattern recognition unveils three key tendencies within the dataset. Firstly, it is evident that when considered as a collective speech group, the 12 disputing spouses prominently favour two attitudinal complexes, namely 'negative Judgement of the antagonist' and 'positive self-Judgement', which collectively constitute nearly 90% of all complexes in the dataset (as depicted in Figure 3). These findings align with the anticipated confrontational and self-defensive behaviours commonly exhibited by
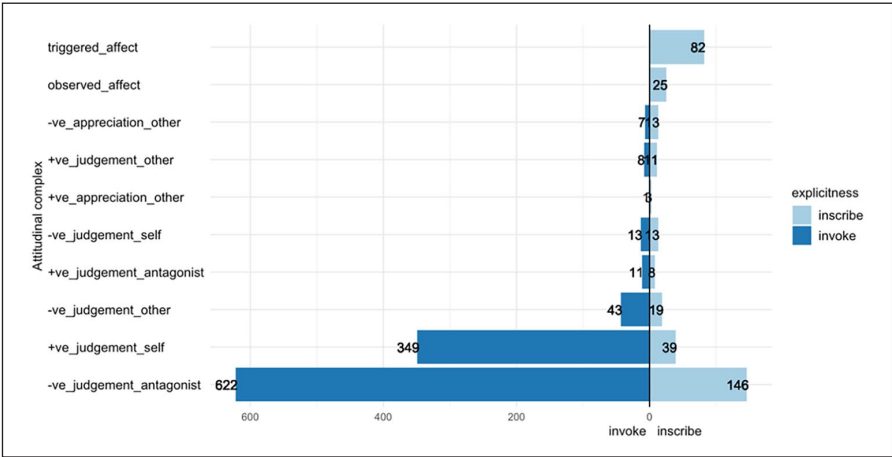
Figure 3. Attitudinal profile in the dataset.

individuals involved in divorce contemplation during family dispute resolutions, thus encapsulating the central concerns expressed by the disputants.

The second tendency focuses on the types of attitudes preferred by the disputants, with a notable preference for Judgement (assessing people's behaviour), particularly directed towards the antagonist and the self. Additionally, the disputants also express their negative emotions (triggered or observed). As foreshadowed in the methodology section, triggered or observed negative Affects hold the potential to evoke negative Judgements directed towards the trigger or emoter of the emotions. For example, reporting that someone was angry potentially invokes a negative Judgement of the emoter, on the basis that being angry is often socially deprecated. Additionally, it has the potential to activate a negative Judgement towards the trigger for being responsible for eliciting such a socially deprecated emotional response. Therefore, those who opt to express or report negative emotions rather than directly assessing others' behaviours may be perceived as employing indirect aggression during mediation.

The third tendency centres around the explicitness of attitudes, with disputants demonstrating a clear preference for advancing attitudes through invocations, as depicted by the predominant presence of deep blue bars on the left in Figure 3. Invocations reflect the speakers' attitudinal alignment with a presumed 'like-minded' audience (White, 2020, 2021). More exactly, invocations indicate the disputants' confidence that the mediators share the same cultural norms and values, so that a mere attitudinal signal (such as upscaling or counter-expectancy) or pure ideational meanings (like recounting a past event) would be sufficient to activate an intended attitudinal assessment from the mediators. Therefore, the disputants' overwhelming preference for invocations, especially in conveying Judgement, suggests an underlying assumption that mediators hold similar values and beliefs, thereby inviting the mediators to evaluate the target in a similar manner. The prevalence of invoked attitudes in the dataset underscores the significance of scrutinizing implicit attitudinal meaning-making within textual data.

Table 2. Selected attitudinal complexes in the framing analysis.

Type	Target	Polarity	Attitudinal complex	Explicitness	Abbreviation
Judgement	Antagonist	Positive	Positive Judgement of the antagonist	Inscribe	PJA
				Invoke	Invo PJA
		Negative	Negative Judgement of the antagonist	Inscribe	NJA
				Invoke	Invo NJA
Judgement	Self	Positive	Positive Judgement of the self	Inscribe	PJS
				Invoke	Invo PJS
		Negative	Negative Judgement of the self	Inscribe	NJS
				Invoke	Invo NJS
Affect	Antagonist as trigger	Negative	Authorial negative Affectual response triggered by the antagonist	Inscribe	NATA
Affect	Antagonist as emoter	Negative/ Positive	Observed antagonist's Affect	Inscribe	OAA

In summary, the initial pattern recognition stage has provided a comprehensive overview of the attitudinal profile of the dataset, shedding light on the disputants' discursive conflict style within the family dispute register. These patterns indicate a confrontational, Judgemental and often indirect approach adopted by the disputants.

Patterned variations

The second pattern recognition stage aims to identify clusters among the disputants by examining their utilization of framing options. Based upon the initial analysis, which indicates that not all attitudinal complex possibilities are equally prevalent in the family mediation register, this stage focuses on a subset of attitudinal complexes that effectively encapsulate the speakers' central concerns, specifically those targeting either the self or their antagonist. A summary of this subset is provided in Table 2.

While theoretically, the inclusion of 10 attitudinal complexes (as listed in Table 2) along with three dialogic framing options and three scaling options allows for a total of 90 scaling and dialogistic framing options, only 43 options are observed in the dataset. Space limitations necessitate a selective and simplified discussion. Table 3 presents the four most popular options used by most disputants with the highest average ratios. These options primarily involve inscribed negative Judgements of the antagonist (NJA), reflecting a central attitudinal concern among the disputants.

Disputant clusters. Methodologically, the examination of 43 framing options indicates the presence of 43 independent parameters of variation. Each framing option is considered as a distinct parameter contributing to the overall variation in the dataset, resulting in high-dimensional data where multiple values are required to uniquely identify each data point. To address this challenge, the analysis employed clustering

Table 3. Four most popular framing options.

'Scaling + dialogistic framing + attitudinal complex' options	Attitudinal complex	Scaling	Dialogistic framing	Example
1 Monoglossed non-scaled negative Judgement of the antagonist	NJA	No-scaling	Monogloss	He **paid lip service** (when saying that he cared) (Wife_W03_WW)
2 Monoglossed upscaled negative Judgement of the antagonist		Upscaling	Monogloss	She's **made a fuss** like this for so many times (Husband_H02_WH)
3 Contracted non-scaled negative Judgement of the antagonist		No-scaling	Contract	He **didn't** want to come to this mediation **with sincerity** (Wife_W03_WW)
4 Contracted upscaled negative Judgement of the antagonist		Upscaling	Contract	She (was) **too impulsive** (Husband_W03_AH)

Note: The lexical items inscribing attitudes are highlighted in bold.

methods from data mining to achieve pattern recognition. The average silhouette method indicated that the optimal number of clusters in the dataset was three (Figure 4). Subsequently, a PCA biplot (Figure 5) was utilized to visually represent the three disputant clusters and the framing options contributing to the dataset's variance. This clustering method captures 39.1% of the variation in the analysis, which involves 12 speakers and 43 framing options.

Clustering implications. The PCA biplot in Figure 5 identifies three distinct disputant groups characterized by their varying preference for the 43 framing options. Each group of speakers exhibits similar ratios for specific framing options, distinguishing them from speakers in the other groups. These groupings reveal three distinct conflict style types observed in the given situation. Broadly speaking, the disputants vary in their 'attitudinality', which refers to the strength of an attitudinal complex. 'Attitudinality' encompasses at least two dimensions of strength: (1) assertiveness, as expressed through dialogistic framing devices, and (2) forcefulness, as expressed through scaling devices. In this analysis, attitudinal complexes conveyed through monogloss are perceived to possess a higher degree of assertiveness compared to those presented through expanded or modalized formulations. Similarly, attitudinal complexes conveyed via upscaling are regarded as having a higher degree of forcefulness compared to those conveyed through downscaling or no-scaling.

The disputant clustering can be interpreted in terms of the relationship between their attitudinality and the attitudinal complexes that hold central significance to them. Disputants in Group 1 (blue) exhibit relatively low attitudinality when framing most attitudinal complexes. Disputants in Group 2 (pink) showcase relatively high attitudinality when presenting their central concern, particularly in Judgement-related attitudinal
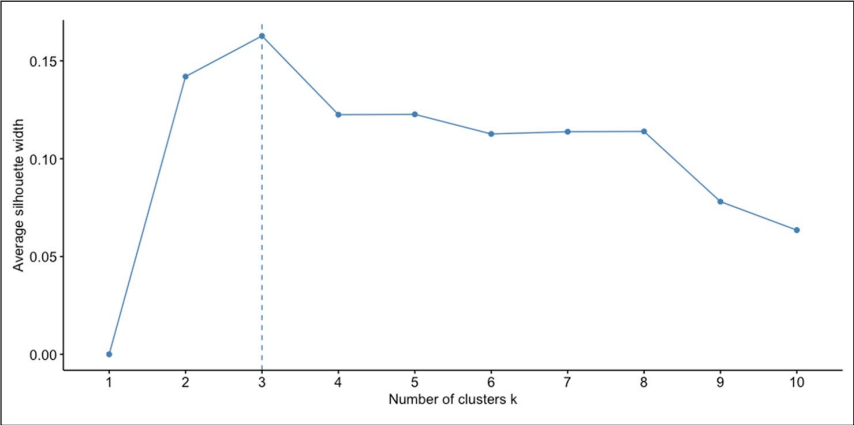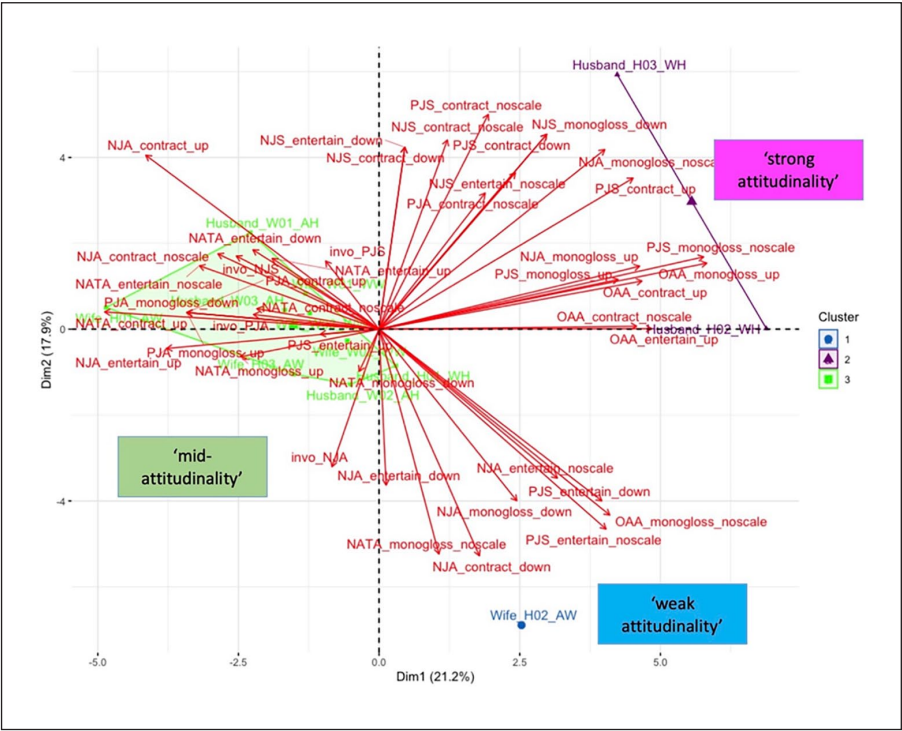
Figure 4. Optimal number of clusters.

Figure 5. PCA biplot illustrating disputant clusters.

complexes. Lastly, disputants in Group 3 (green) display a moderate level of attitudinality but a strong level of forcefulness in negative Affectual attitudinal complexes.

Conflict style 1: Weak attitudinality. The conflict style featured in Group 1 exhibits a weak attitudinality in advancing most attitudinal complexes. These speakers tend to emply downscaling or no-scaling to convey inscribed negative Judgement of the antagonist (NJA) and positive self-Judgement (PJS). They also display a relatively lower inclination towards upscaling, monoglossing or contracting attitudinal complexes. Furthermore, they tend to present authorial negative Affect (NATA) and invoked negative Judgement of the antagonist (invo_NJA) as monogloss without upscaling.

Compared to disputants with harsher and tougher approaches, those with a 'weak attitudinality' present themselves as soft, open to persuasion, and to some extent sentimental. An example of this is Wife_H02_AW, an aggrieved spouse, as evidenced in Excerpt 2. In this excerpt, she recounts a past event involving her husband and a female high schoolmate. The attitudinal instances mainly revolve around negative Judgement of the antagonist (NJA), with two instances conveyed through inscription and five through invocation. None of these instances are framed using upscaling, but two instances are presented with downscaling. The co-occurrence pattern between attitudinal complexes and scaling resources somewhat weakens the wife's accusation against her husband.

It is worth noting that only one speaker in the dataset exhibits the 'weak attitudinality' conflict style, suggesting that opting to mitigate one's attitudinal complexes is uncommon among disputants in family mediation interactions. Most disputants tend to prefer a more uncompromising tone in their accusations and defences, as illustrated in the following two conflict style types.

Conflict style 2: Strong attitudinality. The second conflict style is characterized by 'strong attitudinality', in sharp contrast to the previous 'weak attitudinality' exhibited by the wife. Disputants with this style employ upscaling and assert all their inscribed attitudinal complexes to emphasize their central concerns, such as negative Judgement of the antagonist (NJA), positive Judgement of the self (PJS) and observed Affect of the antagonist (OAA). They generally avoid invocations, downscaling, and expanding, choosing instead to magnify their assessments. Compared to those with a 'weak attitudinality' style, disputants with a 'strong attitudinality' style present themselves as dogmatic, sharp and straightforward.

In the dataset, two individuals demonstrate the 'strong attitudinality' style, one of which is Husband_H03_WH, a husband accused of having flirtatious relationships with a female neighbour and a female business associate. In Excerpt 3, the husband defends himself by shifting blame onto his wife's bad temper.

Excerpt 2 'Weak attitudinality' style (Wife_H02_AW's utterances in Turn 11-19)

Turn	Speaker	Move	Utterance (English translation)	Attitude signal	Attitudinal complex Abbr.	Framing Scaling	Dialogistic framing
11	Wife_H02_AW	1	When he got home after meeting with his high schoolmates				
		2	I found that after he came back				
		3	He had some sort of private chats with the female high schoolmate	evoke	Invo-NJA	Downscaling	Monogloss
		4	The next day after the party, it was on February 14th Valentine's Day evening				
		5	They chatted				
		6	When they chatted, he sent to the female high schoolmate a red envelope of ==520 RMB[7]==	evoke	Invo-NJA	No-scaling	Monogloss
12	Husband_H02_WH	1	==Humph==				
13	Wife_H02_AW	2	Then I found in the chat history were sort of **flirtatious**	inscription	NJA	Downscaling	Monogloss
		2	For example, he said to the female high schoolmate				
		3	[mimicking the husband's voice] Elder sister[8] what's wrong	quotation: other	Invo-NJA	No-scaling	Expand
		4	[mimicking the husband's voice] Do you really want me to call you elder sister	quotation: other	Invo-NJA	No-scaling	Expand
		5	But that kind of voice calling elder sister was not the same as what we do in normal situations	contrast	Invo-NJA	No-scaling	Contract
14	Hostess_H02	1	They had voice chat, right				
15	Wife_H02_AW	1	Yep right				
16	Hostess_H02	1	Does the tone make you feel they were ==a little== flirtatious				
17	Wife_H02_AW	1	==Yep==				
		2	Correct				
18	Hostess_H02	1	And he sent a red envelope of 520 RMB				
19	Wife_H02_AW	1	Yes the feeling for me is, I mean, he has **emotionally cheated**	inscription	NJA	Downscaling	Expand

Note: The lexical items inscribing attitudes are highlighted in bold.

Excerpt 3 'Strong attitudinality' style (Husband_H03_WH's utterances in Turn 103)

Turn	Speaker	Move	Utterance (English translation)	Attitude signal	Attitudinal complex Abbr.	Framing Scaling	Dialogistic framing
102	Hostess_H03	1	So this thing is also innocuous in Mr Ke's opinion				
103	Husband_H03_WH	1	That's for sure				
		2	She wants to **find troubles** for herself	inscription	NJA	No-scaling	Monogloss
		3	I can't communicate with her, you know	denial	Invo-NJA	No-scaling	Contract
		4	If I say a few words to her, she will **pick up an argument** with me defiantly blah blah blah	inscription	NJA	Upscaling	Monogloss
		5	Also she will even **lose her temper**	inscription	NJA	No-scaling	Contract
		6	She will **curse at me, curse at me** to death	inscription	NJA	Upscaling	Monogloss
		7	She will **curse at all my ancestors,** ancestors of eighteen generations	inscription	NJA	Upscaling	Monogloss
		8	She doesn't **curse at you** alone	inscription	NJA	Upscaling	Contract

Note: The lexical items inscribing attitudes are highlighted in bold.

Within Excerpt 3, the husband employs a series of inscriptions to negatively assess his wife. He shows no hesitation in intensifying the emphasis on his wife's inappropriate behaviours, utilizing upscaling devices to amplify the forcefulness of his accusations. By presenting all the negative inscriptions as direct assertions or dialogic contractions, he demonstrates a high level of assertiveness and forcefulness.

Conflict style type 3: Mid-attitudinality. The final conflict style observed in this study is characterized as 'mid-attitudinality', with speakers displaying lower degrees of forcefulness and assertiveness compared to those with a 'strong attitudinality' style, but significantly higher than those of 'weak attitudinality'. These disputants tend to avoid downscaling or expanding their attitudinal complexes and frequently rely on invocations to activate their attitudinal assessments.

An example is Wife_H03_AW, an aggrieved wife who accuses her husband of having a flirtatious relationship with a female neighbour. In Excerpt 4, the wife reports her husband's behaviour during her pregnancy, claiming that he frequently visited the female neighbour's house without attending to her. The husband's coldness triggered the wife's anger, leading to loss of appetite, medical treatment and significant weight loss. Throughout the excerpt, the wife employs upscaling to intensify her anger and the severity of the ideational meanings. Out of 16 attitudinal instances involving invocations or negative affectual responses triggered by the husband, 10 were framed using upscaling. While these attitudinal instances do not explicitly blame the husband, they have the potential to invoke negative Judgement of him. By intensifying the force of these attitudinal assessments, the wife invites mediators to assess the husband attitudinally.

Excerpt 4 'Mid-attitudinality' style (Wife_H03_AW's utterances in Turn 34-38)

Turn	Speaker	Move	Utterance (English translation)	Attitude signal	Attitudinal complex Abbr.	Framing Scaling	Framing Dialogistic framing
34	Wife_H03_AW	1	He went to her house without staying at his own home	contrast	Invo-NJA	No-scaling	Contract
		2	When I was expecting my daughter, I stayed at home with a big belly				
		3	He went to her house to play	evoke	Invo-NJA	No-scaling	Monogloss
		4	To watch TV	evoke	Invo-NJA	No-scaling	Monogloss
		5	Even if you called him, he wouldn't come back	denial	Invo-NJA	Upscaling	Contract
		6	You can always see those two talking and laughing together	evoke	Invo-NJA	Upscaling	Monogloss
35	Hostess_H03	1	How was he to you at that time	inscription	NJA	Upscaling	Monogloss
36	Wife_H03_AW	1	He was very **cold to me**	denial	Invo-NJA	Upscaling	Contract
		2	I couldn't even eat	denial	Invo-NJA	Upscaling	Monogloss
		3	For several days I couldn't even eat	evoke	Invo-NJA	Upscaling	Monogloss
		4	I had, I had the life-saving injection	evoke	Invo-NJA	Upscaling	Monogloss
		5	I almost died				
37	Hostess_H03	1	Why	inscription	NATA	Upscaling	Monogloss
38	Wife_H03_AW	1	Because I was so angry	denial	Invo-NJA	No-scaling	Monogloss
		2	He did not explain it to me				
		3	Whenever I talked to him, he ran	contrast	Invo-NJA	Upscaling	Contract
		4	He ran away without coming back home for a whole day	denial	Invo-NJA	Upscaling	Monogloss
		5	He didn't stay at home	denial	Invo-NJA	No-scaling	Monogloss
		6	He didn't care about you	denial	Invo-NJA	No-scaling	Monogloss
		7	I was a girl of 60kg when I married him				
		8	I suddenly lost my weight to 44kg	contrast	Invo-NJA	Upscaling	Monogloss

Note: The lexical items inscribing attitudes are highlighted in bold.
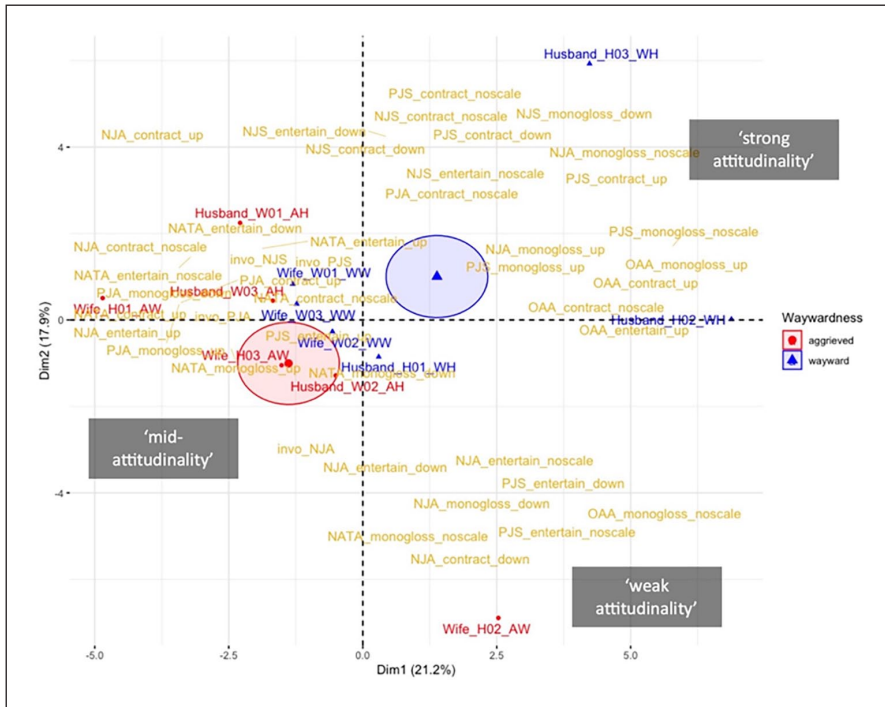
Figure 6. Covariation between the speakers' attitudinality and waywardness.

Nine disputants in the dataset exhibit this 'mid-attitudinality' style, comprising three-quarters of the dataset. This suggests that being in the 'mid-attitudinality' range, rather than being strongly or weakly attitudinal, is a highly common conflict style type in family mediation exchanges.

In summary, the cluster analysis reveals observable disputant clusters with subsets of speakers utilizing framing options in similar ways while differing from other disputants. The three distinct conflict styles suggest variations in the degree of authorial involvement when expressing attitudinal assessments, referred to as attitudinality. Attitudinality can be understood from at least two dimensions: assertiveness and forcefulness. Speakers can heighten or weaken their attitudinality by utilizing different scaling and dialogic framing devices when advancing attitudinal complexes, particularly those directly related to the disputants' primary concerns.

Covariation between disputants' attitudinality and metadata. This section explores the connection between the disputants' attitudinal variations and their metadata, particularly their waywardness and gender. The analysis aims to determine whether wayward spouses exhibit certain attitudinal tendencies while aggrieved spouses lean towards others, and whether the spouses' attitudinality correlates with their gender.
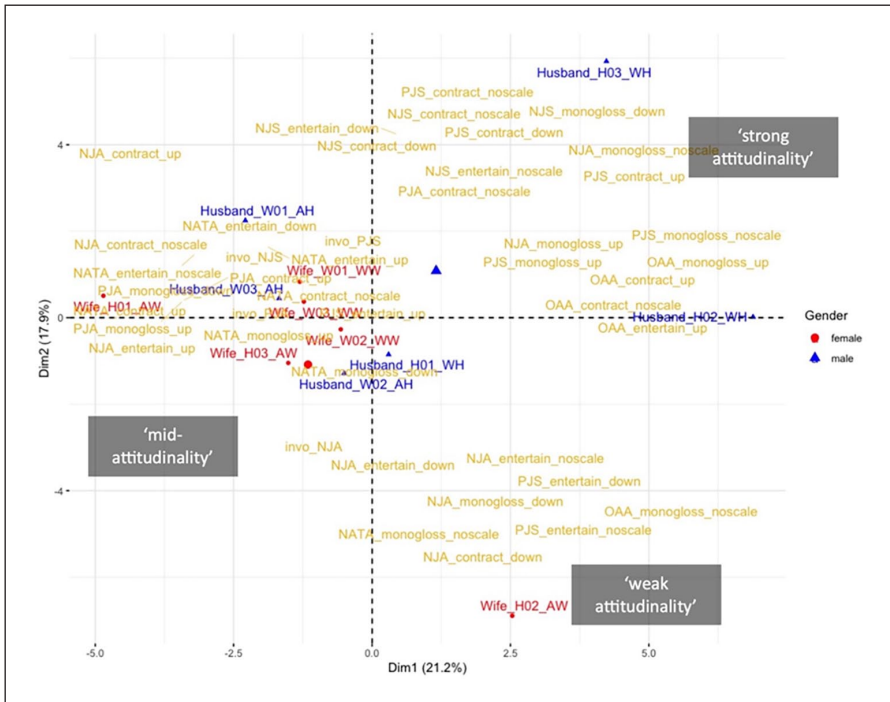
Figure 7. Covariation between the speakers' attitudinality and gender.

The covariation between the speakers' attitudinality and waywardness is presented in Figure 6, a PCA biplot. Generally, wayward spouses (blue triangles) exhibit stronger attitudinality, while aggrieved spouses (red dots) demonstrate weaker attitudinality. In other words, wayward spouses tend to amplify and assert their attitudinal assessments, particularly those related to their central concerns. Consequently, they project a confrontational and defensive self. In contrast, aggrieved spouses tend to present their evaluations as negotiable and moderated, avoiding direct negative assessments of their counterparts. Instead, they express their negative emotions triggered by the antagonists, inviting mediators to assign blame. As a result, they portray themselves as emotionally victimized and yearning for reconciliation.

Regarding the covariation between attitudinality and gender, Figure 7 reveals no clear patterns. Both males and females are dispersed across the PCA biplot without notable distinctions between the two groups.

It should be noted that the sample size of 12 disputants in the dataset is relatively small to draw definitive conclusions regarding the covariation between a disputant's linguistic choice, waywardness or gender. Nevertheless, these findings offer indicative insights into how disputing spouses convey attitudes in family mediation. These insights can inform mediators in adjusting their mediation strategies.

Conclusion

This research has investigated how disputing spouses construct discursive conflict styles through the use of evaluative language. A corpus of 12 speakers from six Chinese televised mediation episodes was transcribed, segmented into moves and annotated using an analytical framework based on the Appraisal framework. The annotation captured the nuanced attitudinal meaning-making, including the target, type, polarity and explicitness of the attitudes, as well as the scaling and dialogic framing devices used. Clustering methods in RStudio identified patterned variations among the 12 disputants in 43 framing options.

The analysis revealed three key findings regarding the disputing spouses' evaluative meaning-making in family mediation. Firstly, disputants in this context prefer assessing each other's behaviour through invocations, with negative Judgements of the antagonist and positive Judgements of the self being top concerns. Secondly, the disputants cluster into three groups based on their preference for the 43 framing options, uncovering similar degrees of preference for certain attitudinal formulations. The three discursive conflict styles are labelled 'strong attitudinality', 'mid-attitudinality' and 'weak attitudinality'. The concept of 'attitudinality' is introduced to describe disputants' linguistic choices for expressing assertiveness and forcefulness when advancing attitudes. Lastly, covariation between the disputants' waywardness and attitudinality indicates that wayward spouses favour heightened attitudinality while aggrieved spouses lean towards weakened attitudinality.

The study contributes to several fields, including Appraisal-based discourse analysis, computational sentiment analysis and conflict style studies. In the realm of Appraisal-based discourse analysis, this study describes the application of a combined linguistic-theory-based Appraisal analysis and programming-language-assisted data mining approach to the corpus. This method significantly improves the efficiency and transparency of Appraisal-based linguistic analysis, striking a balance between delicacy and scalability.

Regarding computational sentiment analysis, the utilization of a linguistic theory-based analytical framework effectively addresses the challenges faced by existing computerized sentiment analysis models, including creating gold standards for sentiment measures, determining the unit of measurement and disentangling sentiment from its source and target (Van Atteveldt et al., 2021). The approach experimented with in this study informs existing models on the determination of analysis units, the identification and analysis of multiple attitudinal axes, particularly attitudinal explicitness, and the scaling and dialogic framing of attitudes.

Furthermore, the study contributes to conflict style studies by identifying a discursively constructed set of conflict styles that focus on the disputants' expression of attitudes. Since the communication of attitudes is crucial in dispute resolution (Garcia, 2019; Greatbatch and Dingwall, 1997), the findings provide valuable insights into the discursive behaviour patterns of disputants within this context, benefiting mediators and mediation researchers.

However, it is important to note that the study has limitations due to the small scale of the analysed data with only 12 disputants. The study does not aim to provide definitive statements about individuals' discursive conflict styles based on their use of evaluative

language. Further data collection is necessary to explore the stability and applicability of these variation patterns, encompassing a larger sample of disputing spouses and other confrontational interactions. Moreover, future computational work in the field of sentiment analysis could leverage the 'attitude signals' identified in this study to develop computational models capable of handling more subtle attitudinal assessments.

Nevertheless, this research offers a novel perspective on conflict styles by delving deep into the discursive construction of styles using opinionated language, thus enriching our understanding of how disputing spouses navigate conflicts and position themselves in mediation.

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Notes

1. https://www.r-project.org/
2. https://github.com/xu-qingxin/DS_Identifying-disputants-attitudinal-variations
3. Due to space limitations, this article will only include English translations of the Chinese utterance transcriptions for the rest of the text.
4. https://www.rstudio.com/
5. https://cran.r-project.org/web/packages/FactoMineR/index.html
6. https://cran.r-project.org/web/packages/factoextra/index.html
7. The number 520 in Mandarin carries a connotative meaning as a love message, as its pronunciation closely resembles 'I love you' when read digit by digit.
8. The Mandarin addressing term 'jiejie' (elder sister) carries a strong connotation of a flirtatious message. In this excerpt, as the wife mimics the husband's voice message, she strategically positions the audience to perceive the husband's behaviour negatively in terms of propriety.

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