

Witness Accounts Are Related to the Different Interviewers - Results from the Khmer Rouge Trials

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Abstract

Differences in witness narratives due to different interviewers may have implications for their credibility in court. Through an investigation of the linguistic experience of witnesses in the Extraordinary Chambers in the Courts of Cambodia (ECCC), this study considers how the interviews by different parties (namely judges, prosecutors, civil party lawyers, defense counsels), as well as gender and nationality of interviewers influence the testimony of witnesses who share comparable traumatic experiences. Transcribed testimonies of 24 victim witnesses and civil parties were analyzed using a computer-based text analysis program, the Linguistic Inquiry and Word Count (LIWC). In particular, witnesses used most cognitive and affective process words during the interview by civil party lawyers and defense counsels. These results may be due to a prior supportive relationship between civil parties and their lawyers and with a more interrogative question style by the defense counsel who attempts to undermine the credibility of the interviewed witness. When answering questions by females, witnesses generally used significantly more cognitive process words. Furthermore, witness testimonies were composed of significantly more verbal expressions of affective processes and of perceptual processes when interviewed by international than by Cambodian parties to the proceeding. Our data show that LIWC analysis is an appropriate method to examine witness accounts and, therefore, contributes to a better understanding of the complex relationship between testimony in events under litigation and credibility.

Introduction

Witnessing crime events can be traumatic and confusing, and speaking with legal professionals can be very intimidating. A combination of interviewer behavior that does not help to promote accurate fact finding and witness vulnerability may bias a witness' account, causing witnesses to change answers that they would not have changed if interviewed in a neutral manner. When witnesses change their answers due to the examiner's question styles and behavior, an increased variability in witness answers can occur and may result in untrustworthy testimony. In the legal context, inconsistencies of interviewees' responses are

strongly associated with a decreased credibility (Berman, Narby & Cutler, 1995). To be believed, the witnesses, no matter what their background or emotional state, must present themselves and their experiences appropriately to the authorities. Credibility strongly relies on the ability of the witnesses to remember and communicate coherently and consistently in court about the horrific experiences they suffered (Herlihy and Turner 2009).

Since inconsistency in disclosure has implications for credibility, variability in witness accounts due to question style, behavior, and social and psychological attributes of the interviewer become important. However, little attention has been paid so far to variability in witnesses' accounts in relation to different interviewers. Because alleged victims are often the only available sources of information about their experiences, professionals have made extensive efforts to understand how the accuracy of testimony might be evaluated and maximized. Most of this research has been conducted in laboratory analog contexts, where researchers can stage events and thus know exactly what actually happened to the interviewees. However, the ecological validity of such research has to be questioned (Orbach and Lamb 2001). To allow ecologically valid statements about how the interviews of different judicial parties influence witness testimonies (and therefore may compromise witness credibility), a court setting from the field is required in which witnesses are homogeneous and can be compared, since a range of witness characteristics, for instance, age, race, stereotypes, and whether the witness is also a victim of the crime (Kapardis 2010), influences witness accounts. Furthermore, the same witnesses have to be interviewed by different parties to proceedings and should be sensitive to the questions of the interviewer.

For this reason, we decided to examine fact witnesses who testified at the Extraordinary Chambers in the Courts of Cambodia (ECCC), since they can be seen as a comparable group of witnesses. They share a common cultural heritage, speak the same language and testified in the same court in similar circumstances. Witnesses recounted their firsthand highly traumatizing experiences during the period of Democratic Kampuchea. Several studies have found exceptionally high rate of posttraumatic stress disorder (PTSD) among Cambodians, reportedly between 11.2% (Sonis et al. 2009) and 28.4% (de Jong et al. 2001). In a group of Cambodian refugees, high levels of association between traumatic experiences and the severity of both traumatic stress and dissociative reactions were found (Carlson and Rosser-Hogan 1991), suggesting that traumatized Cambodians may be more vulnerable to interrogative suggestibility (see also Drake et al. 2008; Merckelbach et al. 2000). Furthermore, it can be assumed that traumatized witnesses may respond with a particular sensitivity to questions of the interviewer due to a heightened sense of ongoing threat (Ehlers and Clark 2000). The chosen sample of witnesses can, therefore, be described as a

homogeneous vulnerable witness group, particularly vulnerable to the stresses of open court questioning, and are therefore especially well-suited for investigating the effects of interview style on witness account in court. Analyzing how witness testimonies are influenced by different interviewers is also facilitated at the ECCC, for a lot of different interviewers are involved. Interviewers differ in terms of their profession, gender, and nationality. The court includes both Cambodian and non-Cambodian personnel. Most of the international personnel are from industrialised, Western-culture nations. Furthermore, at the ECCC, judges and lawyers of both genders are employed.

The task of the ECCC is to try senior members of the Khmer Rouge for war crimes committed between 1975 and 1979. The ECCC was created through an agreement between the Government of the Kingdom of Cambodia and the United Nations. It is described as a hybrid court, as the ECCC features both Cambodian staff and judges together with foreign personnel and both domestic and international law is applied. Since the ECCC is procedurally closely modeled on the civil law system, the Court adopted a predominantly inquisitorial approach. In the inquisitorial system, judges are not passive recipients of information but play a more active role in controlling the course of proceedings. They actively steer the search for evidence and are empowered to put questions to the witnesses. At the ECCC, the judges of the Trial Chamber call witnesses, whose responses are deemed useful in the revelation of the truth, and primarily lead the evidence in the case (Staggs Kelsall et al. 2009). As part of the ECCC process, many survivors provided testimony at the public hearing. The victims of the Khmer Rouge regime participate either as fact witnesses or as civil parties. The latter are legally represented by lawyers and participate in supporting the prosecution (Werner and Rudy 2010). The Trial Chamber hears testimony on the basis of a common witness list that the court created after receiving suggestions from all parties to the hearings. The statutory provisions and recent practice indicate that the judges question the witnesses first, followed by the Co-Prosecutors, the Civil Parties, and the Defense (Petit and Ahmed 2010).

The novelty in our approach is the focus on witness testimonies in relation to different interviewers. We hypothesized (1) that the narrative accounts that witnesses construct differ on a cognitive, emotional, and perceptual level depending on the questions of different law-enforcement personnel (judges, prosecutor, civil party lawyer, defense counsel). Witnesses are not allowed to tell their experiences in their own words but are forced into a co-construction with the interviewer (Eades 2008). Through the act of questioning, the examiner thus controls the form the discourse takes, and ultimately the structure of the information transfer in the court situation (Harris 1984). In practice, it is not always the intention to

interview witnesses in a manner that maximizes their chances of providing accurate testimony. Defense lawyers conducting cross-examination for example may ask more credibility-challenging questions than prosecutors (e.g. Kassin et al. 1990; Hobbs 2003). Biased interviewers attempt to elicit from witnesses' accounts that support interviewers' beliefs about what happened (Bruck et al. 1998). To this end, interviewers may forcibly press witnesses through suggestive questioning methods to describe those events interviewers believe transpired rather than witnesses' actual experiences. According to their own agenda, interviewers of different parties to the proceedings may therefore differ in their questioning and behavior towards the witnesses, which in turn leads to differences in witness accounts.

We assumed that witnesses feel the most at ease to talk when interviewed by their own lawyer. A trusting relationship breaks down resistance (Fisher 1995). Most clinicians and researchers agree that the more at ease the interviewee feels in the interview setting, the more information the person is likely to impart (Powell et al. 2005). This is especially true when the topic is sensitive or traumatic or the interviewee is anxious and fearful about the possible consequences if for example they are disclosing something which they know or fear to be an offence. A clear parallel can be drawn to the therapeutic relationship in psychotherapy. An active, affective, therapeutic relationship is needed to create a safe, interactive environment that promotes disclosure of traumatic experiences. A trusting relationship provides the context necessary for accessing, reworking, and integrating the traumatic material (Olio and Cornell 1993). Therefore, in the interview situation with their own lawyer witnesses should impart most personal information (Powell et al. 2005) and they should draw most attention to themselves and their emotions. Therefore, we expected them (hypothesis 2) to use more emotional, cognitive, and perceptual process words when interviewed by their own lawyers than when interviewed by other parties to the proceedings. Furthermore, we expected that during interview by defense counsels, witnesses would feel most stressed. A stressful interviewing style with a disbelieving stance is likely to decrease the likelihood of a full disclosure. Stress is thought to decrease attention, to reduce motivation and to interfere with efficient recall (Saywitz and Nathanson 1993). Therefore, witnesses should show a decreased attention and should distance themselves from personal trauma. This would be reflected in the use of a lower number of emotional, cognitive, and perceptual process words, when compared to testimony given to other parties to the proceedings (hypothesis 3).

We expected answers given to questions of female interviewers to be different from the ones given to male interviewers. In an analysis of 14000 heterogeneous written and oral samples, Newman et al. (2008) showed that women use more words related to psychological and social processes than men. In particular, the authors found women to use more cognitive,

emotional, and perceptual process words than men. In a linguistic study, Niederhoffer and Pennebaker (2002) were able to demonstrate a linguistic style-matching in dyadic interactions. They found that the words one speaker used prime the listener to respond in a specific way. Following the finding of these studies, it can be expected that witnesses will use more cognitive, emotional, and perceptual process words when interviewed by women than when interviewed by men (hypothesis 4).

Finally, we expected testimony given in response to Cambodian to be different than testimony to non-Cambodian, 'international' interviewers. Given that emotion is less expressed in Cambodia than in the western world (Cheung 1993), one can expect that Cambodian legal professionals may refrain from asking about emotions and affective states whereas international law personnel would not. Again, considering style matching, it can be hypothesized that the Cambodian witnesses will use more emotional process words when interviewed by international parties than when speaking with people with whom they share a culture less inclined to publically express emotion (hypothesis 5).

To summarize, we examined systematic features of testimonies depending on the occupation, gender, and nationality of the interviewers. Specifically: Do witnesses differ in their testimonies depending on the roles of interviewing parties to the proceedings? Are answers given to questions of female interviewers different from answers given to male interviewers? Does the nationality of interviewers influence testimony?

To answer these questions, witness accounts given to the different parties to the proceedings, to female and male interviewers, and to Cambodian and foreign interviewers will be separated into individual text files and processed with a computer-based text analysis program, the Linguistic Inquiry and Word Count (LIWC). Percentage values in the categories of interest (cognitive, emotional, and perceptual processes) will be then compared. The following hypotheses will be tested this way:

- (1) Testimonies given to judges (TJ^1), testimonies given to prosecutors (TP^1), testimonies given to civil party lawyers (TC^1) and testimonies given to defense counsel (TD^1) should significantly differ from each other in the number of cognitive, emotional, and perceptual process words used.

¹ TJ : testimony given to judges; TP : testimony given to prosecutors; TC : testimony given to civil party lawyers; TD : testimony given to defense counsels.

- (2) Witnesses should use more emotional, cognitive, and perceptual process words when interviewed by their own lawyers than when interviewed by other parties to the proceedings.
- (3) Witnesses should use a lower number of emotional, cognitive, and perceptual process words in their answers given to defense counsels, when compared to testimony given to other parties to the proceedings.
- (4) Answers given to questions of female interviewers will should be significantly different from the ones given to male interviewers, containing more emotional, cognitive, and perceptual process words than in the answers given to male interviewers.
- (5) Testimony given in response to Cambodian interviewers should have fewer emotional process words than in testimony given to non-Cambodian, 'international' interviewers.

Methods

Linguistic Inquiry and Word Count

LIWC is a transparent text analysis program that categorizes and quantifies language use and scores words and word stems to psychologically meaningful categories (Tausczik & Pennebaker, 2010). It counts the frequency of words (percentage of all recognized words) in 80 predefined categories, including linguistic processes (e.g., articles, prepositions), psychological processes (e.g., emotional, cognitive, and perceptual processes), words denoting relativity (e.g., time, space), and personal concerns (e.g., religion, work). Over 86% of the words people use in spoken and written comments can be captured by the LIWC2007 dictionary (Pennebaker et al. 2007), the newest version available and the one used in this study. The dictionary consists of almost 4500 words and word stems. Across the categories, several language dimensions are straight forward, meaning that they are objective and based on grammatical rules. For example, the category of articles consists of three words: “a”, “an”, and “the”. Other, more subjective dimensions (e.g., words in the psychological processes and personal concerns categories) are based on a multistep rating procedure involving several trained raters (for details of this procedure, see Pennebaker et al. 2007). Most of the categories are arranged hierarchically. The word “rage”, for example, is sorted into the grand category of emotional process as well as into the subcategory of negative emotion words. The LIWC is especially well-suited to examine differences in witness testimonies varying with different interviewers, because it can analyze voluminous quantities of transcribed verbal text in a very swift and economic manner.

The LIWC word categories have adequate psychometric properties (Pennebaker et al. 2007) and the use of the LIWC to measure psychological processes has increased in the past few years (Kahn et al. 2007). In the current study using the LIWC program (Pennebaker et al. 2007), four aspects of linguistic content and structure were analyzed: psychological processes including sensory processes (referred to in the LIWC program as perceptual processes), affective processes, cognitive processes, and word count. Only in the main linguistic categories (emotional, cognitive, and perceptual process words), where significant differences between groups were found, analyses were calculated for the subcategories, as well. For the main category cognitive process words, only the subcategories insight and causation were examined, for several studies have suggested these two cognitive process subcategories to play a central role in the disclosure of trauma-relevant topics (e.g., Pennebaker et al., 1997). In Table 1, examined main and subcategories are listed, and they are illustrated by example words.

Insert Table 1 about here

Assessment of speech samples and description of subjects

The data are obtained from court trials dealing with atrocities committed during the period of Democratic Kampuchea. The case against Kaing Guek Eav, alias “Duch”, who was head of Security Prison 21 (S-21, Tuol Sleng), spanned a total of 77 days. It started on March 30, 2009, following an initial hearing on February 17, 2009. Substantive hearings came to an end on September 17, and closing submissions in Duch's case were heard from November 23 to 27, 2009. During this time the ECCC heard a total of 47 witnesses (comprising 38 witnesses of fact and 9 expert witnesses) and 22 civil parties. Transcripts of witness testimonies were collected from the cambodiatribunal.org website. Transcripts are translated into English, although witnesses testified in their mother tongue, in Khmer. The English translations of Khmer testimonies are therefore the foundation of the analysis (for a commentary on the translation process, please look at the discussion section). Testimonies of expert witnesses and witnesses of fact whose affidavit were read into the record have not been included in the analysis. Also excluded from evaluation were the testimonies of civil parties, who gave their evidence (concerning damage and injury suffered from the crimes allegedly committed by the accused) beginning on August 7, 2010 and later, because most of them were not interviewed by all the relevant parties to the proceedings. Overall, accounts of 24 witnesses of fact and civil parties were examined.

Transcripts of court proceedings were copied into Microsoft Word files in order to process them with the LIWC (Pennebaker et al., 2007). As described previously, LIWC is a computerized text analysis program that categorizes and quantifies word use. It counts the percentage of a text sample's words that fall into a given predefined category. Because LIWC results are presented in terms of percentages rather than as raw counts, texts samples can be compared against each another, even if the length of each of them varies. Witness statements were first separated by answers to questions of interviewers from the four parties to the proceedings into individual text files. Because the four parties to the proceedings consisted of a total of 26 interviewers, more than one speech sample per witness could be obtained for one party to the proceeding (e.g., up to five speech samples per witness when interviewed by all of the five judges asking questions at the ECCC). Thirteen speech samples contained fewer than 100 words and were therefore excluded from analysis, because Pennebaker (2001) suggested a minimum of 100 words for LIWC analysis. This resulted in a total of 214 speech samples of testimonies given to selected interviewers from the different parties to the proceedings. Processed LIWC results in linguistic categories of interests then were statistically averaged in order to obtain one percentage value for each witness in one predefined LIWC category for answers to one party to the proceeding. This resulted in four percentage values for every single witness in one linguistic category in interviews to the four parties.

In a second step witness statements were separated by answers to questions of male and female interviewers into individual text files. One speech sample per witness could be obtained for each female and for each male interviewer. Again, the processed LIWC results in linguistic categories of interest were statistically averaged to get two percentage values for each witness in each LIWC category of interest for answers to male and female interviewers. The same procedure than was applied for answers to questions of Cambodian and international law enforcement personnel. Analyses undertaken in this study therefore relied on three different data sets.

Although trial proceedings were public and transcripts of witness testimonies are accessible for everyone online, all names in our data are anonymized. The 24 examined witnesses were on average 57.1 years old. Out of the 24 witnesses, three were female and 21 were male and 23 witnesses have Cambodian citizenship, while one person has not but used to live in Cambodia. Seven witnesses gave their evidence as civil parties, whereas the remaining 17 witnesses testified as fact witnesses in open court. Of the legal persons asking questions to the 24 witnesses, there were three Cambodian and two international judges (the Trial Chamber), three Cambodian and five international prosecutors, five Cambodian and five international civil party lawyers, as well as one Cambodian and two international defense

counsels, resulting in 26 interviewers. Six of these interviewers were female and 20 were male.

Statistical analysis

Witnesses' language use during interview through different law-enforcement personnel within the same profession was averaged. Data analysis was performed using SPSS (18.0) software packages (SPSS, Chicago, IL, USA). Normal distribution and homogeneity of variance were tested using a Kolmogorov-Smirnov and Mauchly's sphericity test. All reported results were corrected by the Greenhouse-Geisser procedure, where appropriate (violation of sphericity assumption) (Greenhouse and Junker 1992). To control for differences due to questions of different interviewers in emotional, cognitive and perceptual processes, three analyses of variance (ANOVAs) for repeated measures were computed². Statements of the same witnesses were compared in four conditions: statements following questions by judges, prosecutors, civil party lawyers, and defense counsels. Differences in dependent linguistic variables of interest that were not normally distributed were analyzed with nonparametric Friedman's ANOVA. After the main linguistic categories (emotional, cognitive, and perceptual process words) were analyzed, where significant differences between groups were found, analysis of variance (ANOVAs) for repeated measures or nonparametric Friedman's ANOVA were calculated for selected subcategories. Follow-up tests, where overall effects from Friedman's ANOVA were significant, were performed with the Wilcoxon signed-rank tests and two-tailed t-tests in cases, where overall effects from analysis of variance (ANOVA) were significant. Although there is a priori expectation about directionality, two-tailed t-tests were conducted in order to satisfy a more conservative approach to statistical significance. T-tests and Wilcoxon signed-rank tests were accepted as significant only if their significance was less than $\alpha/6$, on adjustment for the number of analyses meaning they had a p value less than 0.0083.

To compare witness statements depending on gender and nationality of law enforcement personnel, dependent t-tests were used. Results were considered statistically significant at the $p \leq 0.05$ level, and all tests were two-tailed. In the case of single missing data, cases were excluded listwise, meaning if a witness was not interviewed by one party, the witness' linguistic data of answers given to other parties to the proceedings were excluded from analysis as well.

² See Appendix for description of the reasons why a 4x2x2 analysis of variance design relying on one data set was not feasible in this study.

Results

The results section is subdivided in three parts, linking each of the inferential analyses to the three specific questions of the role, gender, and nationality of the interviewers.

Responses to different parties to the proceedings

Due to the fact that one witness was not interviewed by the prosecution and another witness was not interviewed by the defense counsels, the testimonies of two witnesses were excluded. Therefore, speech samples from 22 witnesses were analyzed, of whom three were female and 19 male. All of the 22 witnesses underwent four conditions in the exact same order: Interview by judges, by prosecutors, by civil party lawyers, and by defense counsels. The sample consists of six civil parties and 16 fact witnesses.

Statements to judges, prosecutors, civil party lawyers, and defense counsels differed in terms of their total word count. In the examined main categories (see Table 2), significant differences were found for affective processes, cognitive processes, and perceptual processes over the four conditions. Differences in witness testimonies depending on different interviewers were, furthermore, found in the emotion subcategory *negative emotion* ($\chi^2(3)=10.397$, $p=0.014$, Kendall's $W=0.158$), in *anxiety* ($\chi^2(3)=9.230$, $p=0.024$, Kendall's $W=0.0.140$), and in *anger* ($\chi^2(3)=9.152$, $p=0.021$, Kendall's $W=0.139$), in the cognitive process subcategories *insight* ($F(3/63)=4.222$, $p=0.009$, $\eta^2=0.167$), and *causation* ($F(3/63)=5.674$, $p=0.002$, $\eta^2=0.213$), as well as in the perception subcategory *feel* ($\chi^2(3)=13.688$, $p=0.003$, Kendall's $W=0.207$).

Insert Table 2 about here

Word Count: Answers to judges, prosecutors, civil party lawyers, and defense counsels differed in terms of actual word count. When interviewed by judges, witnesses' testimonies composed of a significantly higher number of words compared to *TP*, *TC* and *TD*.

Affective process words: Testimonies containing affective process words significantly differed in relation to the interviewer roles. Most affective words were used during interview by defense counsels. Post hoc analysis showed significant differences between *TJ* and *TC* ($z=-3.490$, $p=0.000$, $r=-0.526$) as well as between *TJ* and *TD* ($z=-2.776$, $p=0.004$, $r=-0.418$). Over the four interviewer roles, significant differences in witness statements were found for negative emotion words. Most negative emotion words and most anger words were used during interview with defense counsels, whereas testimonies during interview by civil party lawyers contained most words related to anxiety. Post hoc analysis showed significant

differences for the category *negative emotion words* between *TJ* and *TC* ($z=-3.295$, $p=0.001$, $r=-0.497$), as well as for the subcategory *anxiety* between *TJ* and *TC* ($z=-2.679$, $p=0.007$, $r=-0.404$).

Cognitive process words: Most cognitive process words were used when witnesses were interviewed by civil party lawyers. Different findings applied for the subcategories *insight* and *causation*, where most words were used by the interviewees of the defense counsels. Significant differences in cognitive process words were found between *TJ* and *TC* ($z=-3.393$, $p=0.000$, $r=-0.512$) and between *TJ* and *TD* ($z=-3.523$, $p=0.000$, $r=-0.531$), as well as between *TP* and *TC* ($z=-2.711$, $p=0.005$, $r=-0.409$). Post hoc tests revealed differences in the subcategory *causation* between *TJ* and *TC* ($t(21)=-3.446$, $p=0.002$, $r=0.601$) and between *TJ* and *TD* ($t(21)=-3.154$, $p=0.005$, $r=0.567$) as well as in the subcategory *insight* between *TJ* and *TD* ($t(21)=-3.624$, $p=0.002$, $r=0.620$).

Perceptual process words: Witness testimonies during interview by civil party lawyers contained most perceptual process words. Differences in the use of perceptual process words were found between *TC* and *TD* ($z=-2.581$, $p=0.008$, $r=-0.389$) and differences in the use of words related to *feeling*, a subcategory of perceptual processes, were detected between *TC* and *TJ* ($z=-2.597$, $p=0.009$, $r=-0.392$) as well as between *TC* and *TD* ($z=-3.173$, $p=0.002$, $r=-0.478$).

Insert Table 3 about here

Testimonies depending on the gender of the interviewing person

One witness was exclusively interviewed by male interviewer. Therefore, the analyzed sample consists of 23 witnesses. Of the 26 persons who interviewed these 23 witnesses, 6 were female and 22 were male.

Insert Table 4 about here

Statistically significant differences in the main LIWC-categories were found for overall word count and cognitive processes (see Table 4). When answering questions by females, witnesses generally used fewer words, but more cognitive process words and they showed a higher mean in the subcategory *insight* ($t(22)=-3.038$, $p=0.006$, $r=0.544$).

Testimonies depending on the nationality of the interviewing person

All examined witnesses were interviewed by both national and international parties to the

proceedings. The sample used in this analysis therefore consists of 24 witnesses.

Answers to Cambodian law enforcement personnel were longer (see Table 5). However, witness testimonies were composed of significantly more verbal expressions of affective processes and of perceptual processes when interviewed by international parties to the proceeding. In the subcategories of the affective process words, significant differences were found for *positive emotions* ($z=-2.486$, $p=0.013$, $r=-0.367$) as well as for anxiety ($t(23)=-2.668$, $p=0.014$, $r=0.236$), indicating that witnesses referred less to positive emotions and anxiety when interviewed by national law enforcement personnel. In the subcategories of the perceptual process words, significant differences were found for *hear* ($z=-2.886$, $p=0.004$, $r=-0.417$). Witnesses referred more to *hearing* when interviewed by international law enforcement personnel.

Insert table 5 about here

Discussion

Consistent with the hypotheses 1, 2, and 3, differences in witness testimonies were related to different parties to the proceedings as well as to the gender (hypothesis 4) and nationality of the interviewers (hypothesis 5). Linguistic style differences in witness testimonies varied with the interviewing parties to the proceeding and were found in verbal expression of affective, cognitive, and perceptual processes and in terms of actual word count. Main differences in testimonies were found between interviews by judges and civil party lawyers, and between interviews by judges and defense counsels. When interviewed by civil party lawyers, witnesses verbally expressed more emotions, in particular, more negative emotion such as anxiety, more cognitive process such as causation words, and more perceptual process words such as *feel*, relative to when they were interviewed by judges. Contrary to our expectation for hypothesis 3, in answers to defense counsels, an increased use of affective process words, as well as an increased use of cognitive process words (more insight and causation words) could be found compared to the answers given to judges. When answering questions of females, witness generally used more cognitive process words, compared to when answering questions of males. Furthermore, witness testimonies were composed of significantly more verbal expression of affective and perceptual processes when interviewed by international parties to the proceeding in comparison to interview by Cambodian legal professionals.

Differences in word count in answers given to legal professionals first and foremost reflect the different allocated time slots for each party to interview witness. Prosecutors were allowed to ask witness questions for 15, 30, 45, and 60 minutes, respectively, depending on

the length of overall witness account. Civil party groups and defense had a limited amount of time to interview- also 20, 40, 60, or 80 minutes. No time allocation was defined for interview by judges. When interviewed by judges, witness testimonies were composed of almost four times more words than when interviewed by prosecutors, civil party lawyers or defense counsels. Although civil party lawyers and defense counsel had a bit more time available than prosecutors to interview witnesses, witness testimonies did not differ concerning their length over these interviews. In the LIWC program, all word counts are expressed as a percentage of the total number of the words (and thus controlling for the length of the writing sample). Therefore, the length of the testimonies did not need to be corrected.

The observation that more affective and cognitive process words were used during interview by civil party lawyers than during interview by judges and prosecutors suggests that witnesses may be affectively and cognitively more activated during the interview with their own lawyers. Pham et al. (2011) interviewed all of the Cambodia-resident civil parties (75 of the total 90) participating in Trial 1, and reported that 71% of them felt respected by their lawyer, and 15 of the 17 who testified said that their lawyer had helped them to prepare. Their higher emotional and cognitive engagement might be a result of a more trusting relationship between witnesses and these lawyers. Witnesses may therefore impart more personal information, draw more attention to themselves and their emotions and immerse themselves more fully in their trauma, which is associated with higher perceptual feelings (reflected in the higher use of feeling words). When the memory of a negative emotional episode is accessed, the physiological, sensory, and experiential components of the corresponding emotions also are activated (Bower 1981; Lang 1983; Leventhal 1984). Research into the recall of traumatic experiences shows a greater use of sensory words in more traumatic sections of trauma narratives (Hellowell and Brewin 2004) and that trauma narratives contain greater somatosensory detail than comparison narratives (Beaudreau 2007). Furthermore, Holmes et al. (2007) found that using more emotion words to describe experienced traumatic events is significantly associated with increased perceptual feelings. In addition, the stronger processing of emotions is associated with a greater cognitive processing of the traumatic experiences. Boals and Klein (2005) assume that the use of cognitive words reflect an active search for meaning and understanding of a traumatic event and that especially the employment of causal words can be seen as a measure of the extent to which an individual is going through the process of organizing his or her thoughts about an event and attempting to create causal connections. The higher cognitive, emotional, as well as perceptual activation during the interview by civil party lawyers may reflect a better ability or greater willingness to engage in the processing and reactivating of the trauma in this interview situation.

Using more cognitive process words during the interview by defense counsel than during interview by judges, on the other hand, may reflect a higher cognitive activation due to a more interrogative question style by the defense counsel who attempts to undermine the credibility of the witness. Defense counsels confront witnesses with possible contradictions. A high cognitive load is required to maintain a report against accusations of not telling the truth and witness are forced to create causal explanations to organize their testimonies. Due to the confrontation with presumed inconsistencies, witnesses have to differentiate between multiple competing solutions – staying with or changing their prior statements. Defense counsels' confrontation of facts of witnesses traumatic experiences may be compared with exposure to trauma-related stimuli. It can be concluded that during interview by defense counsel, witnesses are confronted to a higher degree with trauma-related stimuli than when interviewed by judges, and therefore also are more intensely engaged with their traumatic memories. This process is again associated with a stronger affective engagement. Therefore, contrary to our expectation, experienced stress due to a credibility challenging interview style by defense counsel does not seem to distance from personal trauma.

When answering questions of women, witnesses used more cognitive process words, in line with research showing a female speech style where more cognitive process words are used (Newman et al. 2008). This may have primed witnesses to also respond with more cognitive process words (Niederhoffer and Pennebaker 2002). Contrary to our expectation, witnesses did not use more affective and perceptual process words when answering questions to female interviewers. Furthermore, women refer more to psychological aspects (Newman et al. 2008) of experienced traumatic events. The female law personnel may have asked more personal questions, questions about emotional state, personal experiences, witnesses' social environments, and loss of family members. These possibilities constitute an empirical question, suggesting further directions for investigation. Witnesses' increased use of cognitive process words may also be seen as reflecting an active search for meaning and understanding of the traumatic experiences under the guidance of a female interviewer.

Witness testimonies were composed of significantly more verbal expressions of affective and perceptual processes when interviewed by international parties to the proceedings. Knowing the origins of these differences is speculative, because Cambodian and international interviewers differ in so many aspects. Nevertheless, personal feelings are generally considered a highly private matter in Cambodia and cultural rules governing behavior prohibit the open expression of strong affect (Cheung 1993). Cambodian legal professionals may refrain from asking about emotions and affective states and avoid emotional process words, whereas international law personnel would not. This could be the reason why witnesses

verbally express more affective processes, namely positive emotions and anxiety, when interviewed by international law personnel. Again, a linguistic style matching in the interviews has to be considered. However, it is important to stress that cultural differences in interview can lead to large discrepancies in witnesses' manner of speech and demeanor. Combs (2010) claimed that this is one of the reasons why international criminal trials confront severe impediments to accurate fact-finding. She reviewed transcripts from three different international criminal courts and concluded that much eyewitness testimony was of highly questionable reliability due to different languages and to different cultural norms of witnesses and fact finders.

This work is, to our knowledge, the first field study that analyzes differences in witness account from a linguistic perspective with a well validated text analysis program (Pennebaker et al. 2007). The psychological study of language use has recently received intensified attention in research (Pennebaker et al. 2003). Word-count-based text analysis approaches have been shown to reliably detect meaning in a wide variety of experimental settings, including showing attentional focus, emotionality, social relationships, thinking styles, and individual differences (Tausczik and Pennebaker 2010). Given that inconsistency in witness disclosure has implications for credibility (Berman, Narby & Cutler, 1995; Herlihy and Turner 2009), variability in witness accounts due to question style, and social, and psychological attributes of the interviewers, was examined in the present study. Although witnesses are often the only available sources of information about their experiences, only little attention has been paid to variability in witness accounts in relation to different interviewers so far. The present results are consistent with the conclusion that linguistic analysis of testimony in concert with understanding its context represents a new direction of research in the field of psychological injury and law. For example, in tort cases, the procedure could be applied to transcripts of interviews by plaintiffs and defense attorneys.

Nevertheless, several limitations to our study should be taken into account. First of all, the Khmer Rouge tribunal is trilingual - originally witness testimonies were given in Khmer, then simultaneously translated into English, and then from English into French. For reasons of consistent evaluation, the English translations of Khmer testimonies were the foundation of the analysis. Due to the translation process from Khmer into English, a loss of information can be assumed. Although the ECCC employed 40 persons in the interpreter and translation pool, complaints about interpretation have surfaced. Translations were not validated in that, for example, a back-translation method was not used. Therefore, all witness accounts should have also been analyzed in their native language, but no Khmer-LIWC dictionary exists so far. In terms of the ecological validity of the study, multilingual international tribunals are the

reality and the translation issue often places foreign judicial staff at a disadvantage to their national counterparts. Hence, analyzing translated witness testimonies deals with the fact that not every interviewer benefits from the advantages of the original answers given in the witness' mother tongue. Nonetheless, because of the translation issue, the linguistic dimension of the LIWC2007 (e.g., percentage of words in the text that are pronouns, articles, auxiliary verbs, etc.) had to be neglected. Special characteristics of each language risk passing unnoticed in the translation and differences from the original can occur. The focus was rather on the content-related LIWC dimensions, which offer insight into crucial emotional, cognitive and perceptual processes of the witnesses.

A second limitation relates to the issue of witness type. At the ECCC, witnesses were called by judges. However, all parties to the proceedings were able to make propositions concerning the selections of witnesses prior to the hearing, with the result that some witnesses would be more damaging, others more supportive to the prosecution. It is thus possible that parties to the proceedings (judges, prosecutors, civil party lawyers, defense counsels) differed in their attitudes towards each witness. Witnesses therefore may not have been treated equally and interviewers possibly varied their questioning strategies as a function of the assumed sympathies of respective witnesses (see Luchjenbroers 1997). Concerning witness type it must be stressed that witnesses gave evidence either as fact witnesses or as civil parties. Civil parties were legally represented by their lawyers and thus possibly had a prior relationship with them, whereas fact witnesses did not. These differences were not taken into account in our analyses.

A further limitation of the study is a constraint concerning the method. Because a within-participants design was used as the statistical analysis in this field study, order effects have to be taken in to account. The order of interview was determined by the ECCC and did not vary. As a result, these effects could not be equalized across interviews by the principle of counterbalancing (Jackson 2011). To control for gender and nationality of different interviewers a repeated measure ANOVA should have been applied. Within-subjects factors in the analysis should have been party to the proceeding (4 levels), nationality (2 levels) and gender (2 levels) of interviewers. This would have been resulted in a repeated measure ANOVA design with 16 measurements (4x2x2). Due to the naturalistic data resulting from this field study a lot of missing values had to be taken into account. At the ECCC there are for example no female Cambodian judges, no female prosecutors and no female Cambodian defense counsels. Therefore, no data was available for 4 measurements and a repeated measure ANOVA design with 16 measurements (4x2x2) could not be applied. It clearly is a disadvantage of naturalistic observation in a field study that it is not possible to control for all

the variables and therefore a certain degree of confounding of the results has to be taken into account. Finally the small sample size of the study (N = 24) was determined by the facts of the court proceedings, and constitutes an additional reason why the current study should be replicated and extended.

Conclusions

The main finding of this study is that the linguistic contents of witness-testimonies differ in relation to different interviewers. Legal professionals differ in various variables such as professional role, gender, and nationality, and this influences the linguistic contents of testimony. However, whether these differences in witness accounts are related to the behavior, the social and psychological attributes, or the questioning style of the different interviewers remains speculative. In further studies, several steps should be undertaken: First, it would be essential to examine the linguistic patterns of the questions asked by the different parties to the proceedings and to relate the linguistic contents of the witness accounts to the proceeding questions. Second, part of our aim was to use LIWC technology to analyze a vast variety of witness' testimonies in a swift and economic manner. Nevertheless, a qualitative investigation of witness' account differences would be useful for future research. Such an investigation would allow for a more complete explanation of the ways in which question style, behavior, and social and psychological attributes of the interviewer contribute to differences in witnesses language use and would allow the analysis of categories beyond linguistic processes. Third, the investigation of the perceived credibility of witness accounts during interview by different legal professionals might be interesting. Our findings of inconsistencies in witness testimonies due to different interviewers could then be linked with changes in perceived credibility and the notion of a strong relationship between inconsistency in witness account and witness credibility could be further clarified.

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Table 1

LIWC2007 content categories of affective, cognitive and perceptual processes, with subcategories, abbreviation and examples (according to Pennebaker et al. 2007)

Category	Abbreviation	Examples
Affective processes	affect	Happy, cried, abandon
Positive emotion	posemo	Love, nice, sweet
Negative emotion	negemo	Hurt, ugly, nasty
Anxiety	anx	Worried, fearful, nervous
Anger	anger	Hate, kill, annoyed
Sadness	sad	Crying, grief, sad
Cognitive processes	cogmech	Cause, know, ought
Insight	insight	Think, know, consider
Causation	cause	Because, effect, hence
Perceptual processes	percept	Observing, heard, feeling
See	see	View, saw, seen
Hear	hear	Listen, hearing
Feel	feel	Feels, touch

Table 2

Differences in linguistic variables related to parties to the proceedings (according to the analysis of the linguistic inquiry and word count)

	Testimonies depending on interrogation by judges	Testimonies depending on interrogation by prosecutors	Testimonies depending on interrogation by civil party lawyers	Testimonies depending on interrogation by defense counsels	F/Chi-Quadrat	Effect sizes
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>		
word count	2185.07 (1204.37)	550.43 (325.75)	498.51 (206.46)	542.07 (344.14)	$\chi^2(3)=35.291^{***}$	K's W=0.535
affect	2.00 (.83)	2.48 (1.19)	2.79 (.73)	3.00 (1.63)	$\chi^2(3)=13.036^{**}$	K's W=0.198
<i>negemo</i>	.98 (.34)	1.44 (.94)	1.46 (.54)	1.58 (1.16)	$\chi^2(3)=10.397^*$	K's W=0.158
<i>anx</i>	.15 (.17)	.20 (.17)	.26 (.22)	.20 (.49)	$\chi^2(3)=9.230^*$	K's W=0.140
<i>anger</i>	.39 (.17)	.63 (.61)	.57 (.34)	.89 (1.07)	$\chi^2(3)=9.152^*$	K's W=0.139
cogmech	16.84 (1.28)	18.42 (2.63)	19.78 (2.84)	19.68 (3.44)	$\chi^2(3)=18.873^{***}$	K's W=0.286
<i>insight</i>	2.23 (.63)	2.59 (1.13)	2.86 (1.20)	3.15 (1.15)	F(3/63)=4.222 ^{**}	$\eta^2=0.167$
<i>cause</i>	1.39 (.36)	1.36 (.79)	1.77 (.44)	1.85 (.72)	F(3/63)=5.674 ^{**}	$\eta^2=0.213$
percept	1.66 (.69)	2.14 (1.33)	2.18 (.90)	1.73 (.79)	$\chi^2(3)=8.394^*$	K's W=0.127
<i>feel</i>	.19 (.14)	.21 (.22)	.37 (.32)	.14 (.20)	$\chi^2(3)=13.688^{**}$	K's W=0.207

Note. LIWC results are presented in terms of mean percentages of total words. Significance at the *** (1%), ** (5%), * (10%) level. K's W = Kendall's W.

Table 3

Difference in witness testimonies due to different parties to the proceedings (according to the analysis of the linguistic inquiry and word count)

	Judges- Prosecutors	Judges-Civil Party Lawyers	Judges- Defense	Prosecutors- Civil Party Lawyers	Prosecutors- Defense Counsel	Civil Party Lawyers- Defense
word count	$z=-4.074^{***}$ ($r=-0.614$)	$z=-4.107^{***}$ ($r=-0.619$)	$z=-4.042^{***}$ ($r=-0.609$)	n.s.	n.s.	n.s.
affect	n.s.	$z=-3.490^{***}$ ($r=-0.526$)	$z=-2.776^{**}$ ($r=-0.418$)	n.s.	n.s.	n.s.
cogmech	n.s.	$z=-3.393^{***}$ ($r=-0.512$)	$z=-3.523^{***}$ ($r=-0.531$)	$z=-2.711^{**}$ ($r=-0.409$)	n.s.	n.s.
percept	n.s.	n.s.	n.s.	n.s.	n.s.	$z=-2.581^{**}$ ($r=-0.389$)

Note. Adjustment for multiple comparisons: Bonferroni. Wilcoxon signed-rank tests were accepted as being significant if they had a p value that was less than 0.0083.

Table 4

Differences in linguistic variables related to gender of interviewer (according to the analysis of the linguistic inquiry and word count)

	Testimonies depending on interrogation by male interviewer	Testimonies depending on interrogation by female interviewer	t/z (Effect sizes)
	Mean (SD)	Mean (SD)	
word count	1144.39 (489.90)	455.91 (210.45)	t(22)=6.709*** (r=0.820)
affect	2.43 (0.75)	2.64 (1.15)	z=-0.973
cogmech	17.88 (1.60)	19.88 (2.62)	t(22)=-4.981*** (r=0.728)
percept	1.85 (0.63)	2.25 (1.19)	t(22)=-1.959

Note. LIWC results are presented in terms of mean percentages of total words in text samples. Significance at the *** (1%), ** (5%), * (10%) level.

Table 5

Differences in linguistic variables related to nationality of interviewer (according to the analysis of the linguistic inquiry and word count)

	Testimonies depending on interrogation by national interviewer Mean (<i>SD</i>)	Testimonies depending on interrogation by international interviewer Mean (<i>SD</i>)	t/z (Effect sizes)
word count	1139.27 (628.74)	737.94 (386.46)	t(23)=2.518* (<i>r</i> =0.464)
affect	2.17 (.76)	2.81 (1.02)	t(23)=-3.098** (<i>r</i> =0.543)
cogmech	18.02 (2.14)	18.65 (2.05)	t(23)=-1.274 (<i>r</i> =0.257)
percept	1.77 (.66)	2.41 (1.40)	z=-2.429* (<i>r</i> =-0.351)

Note. All scores reflect mean percentage of total words. Significance at the *** (1%), ** (5%), * (10%) level.

Appendix

A 4x2x2 analysis of variance design relying on one data set was not feasible. All witnesses were measured under a number of different conditions (interviews by judges, prosecutors, civil party lawyers and defense counsels). As the sample is exposed to each condition in turn, the measurement of the dependent variable is repeated. Using a standard ANOVA in this case is not appropriate because it fails to model the correlation between the repeated measures: the data violate the ANOVA assumption of independence. To control for gender and nationality of different interviewers a repeated measure ANOVA is needed. Within-subjects factors in the analysis are party to the proceeding (4 levels), nationality (2 levels) and gender (2 levels) of interviewers. This results in a repeated measure ANOVA design with 16 measurements (4x2x2). Due to the naturalistic data resulting from this field study, a lot of missing values unfortunately have to be taken into account (see Table 6). There are for example no female Cambodian judges, no female prosecutors and no female Cambodian defense counsels interviewing witnesses at the ECCC. Therefore, no data is available for 4 measurements. It is a disadvantage of naturalistic observation that it is not possible to control for all the variables. Therefore, a certain degree of confounding was taken into account.

Table 6
Data structure of the current study

	Judges				Prosecutors				Civil Party Lawyers				Defense Counsels			
	National		International		National		International		National		International		National		International	
	♂ N=3	♀ N=0	♂ N=1	♀ N=1	♂ N=3	♀ N=0	♂ N=5	♀ N=0	♂ N=3	♀ N=2	♂ N=2	♀ N=3	♂ N=1	♀ N=0	♂ N=1	♀ N=1
1	X	-	X	X	X	-	-	-	X	X	-	X	X	-	-	X
2	X	-	X	X	X	-	X	-	X	X	-	X	X	-	-	-
3	X	-	X	-	X	-	X	-	X	-	X	-	X	-	-	X
4	X	-	X	-	X	-	-	-	X	X	X	X	(X)	-	-	-
5	X	-	X	-	X	-	X	-	X	X	X	X	-	-	X	-
6	X	-	X	X	X	-	X	-	X	-	X	X	-	-	-	X
7	X	-	(X)	X	(X)	-	-	-	-	X	X	X	X	-	-	X
8	X	-	-	-	X	-	-	-	X	-	X	X	X	-	-	-
9	X	-	X	X	X	-	X	-	X	-	-	X	X	-	-	X
10	X	-	X	-	X	-	X	-	X	-	-	X	X	-	-	X
11	X	-	X	-	X	-	X	-	-	X	-	-	X	-	-	-
12	X	-	X	X	X	-	X	-	-	-	-	X	X	-	X	-
13	X	-	X	X	X	-	X	-	X	-	X	X	X	-	X	-
14	X	-	X	X	X	-	X	-	X	X	X	X	X	-	X	-
15	X	-	X	X	X	-	X	-	X	-	X	X	X	-	X	-
16	X	-	X	X	X	-	(X)	-	-	-	-	X	X	-	-	-
17	X	-	X	X	X	-	X	-	X	X	-	X	X	-	-	-
18	X	-	X	(X)	X	-	-	-	-	X	-	(X)	X	-	X	-
19	X	-	X	-	X	-	X	-	-	X	-	X	X	-	X	-
20	X	-	X	-	X	-	X	-	X	-	-	X	X	-	X	-
21	X	-	-	-	(X)	-	X	-	X	-	-	-	X	-	-	(X)
22	X	-	X	-	X	-	X	-	-	X	-	X	X	-	-	-
23	X	-	X	X	X	-	X	-	X	-	X	-	-	-	X	-
24	X	-	X	-	-	-	X	-	X	X	X	X	-	-	X	-

Note. X: speech samples available, (X): speech samples available but contained fewer than 100 words (and were therefore excluded from analysis), -: no data available. Witness number 3 and 7 were excluded from analysis because of missing values in interviews of a least one party.

In order to attempt to accommodate complaints of confounded data, we further conducted several nonparametric two-related samples tests (Wilcoxon signed-rank test), where possible. It was analyzed whether there were differences within the categories (parties to the proceedings) depending on either nationality (are there any differences in witness

testimonies depending on nationality of judges, prosecutors, civil party lawyers and defense counsels?) or gender (are there any differences in witness testimonies depending on gender of judges, prosecutors, civil party lawyers and defense counsels?). The results of these nonparametric two-related samples tests are described hereafter (see also Table 7 and 8), but must be interpreted with caution due to difficulties of representativity of the samples of interviewers (e.g. only one female judge, only one female defense counsel).

Differences in linguistic variables related to parties to the proceedings and nationality

- Overall, the answers to Cambodian law enforcement personnel were longer. However, nonparametric two-related samples tests showed that this statistical difference was driven by longer answers given to Cambodian judges ($z=-2.987$, $p=0.002$). No statistical differences were found between Cambodian and international prosecutors, between Cambodian and international civil party lawyers and between Cambodian and international defense counsels.
- Witness testimonies were composed of significantly more verbal expression of affective processes. Nonparametric two-related samples tests revealed differences between Cambodian and international judges ($z=-2.539$, $p=0.009$) and between Cambodian and international prosecutors ($z=-2.172$, $p=0.028$). These international parties to the proceedings evoked significantly more affective process words in witness testimonies. Similar results were found for the subcategory positive emotion. The finding that witness used more positive emotion words when interviewed by international interviewers can be explained by significant differences in positive emotion words in testimonies given to Cambodian and international judges ($z=-2.203$, $p=0.027$) and in testimonies given to Cambodian and international prosecutors ($z=-3.051$, $p=0.001$).
- Although significantly more words of anxiety were observed when witness were interviewed by international law enforcement personnel (analyzed independently of membership to different parties to the proceedings), subgroup analyses with nonparametric two-related samples tests showed no differences in the use of anxiety words in witness accounts given to Cambodian and international judges, to Cambodian and international prosecutors, to Cambodian and international civil party lawyers and to Cambodian and international defense counsels.
- Witness referred more to perceptual processes and to the subcategory hearing when interviewed by international law enforcement personnel. Nonparametric two-related samples tests showed equal results for perceptual processes when witnesses were interviewed by international judges (compared to when interviewed by Cambodian judges) (differences in perceptual processes: $z=-2.352$, $p=0.017$; differences in hearing: $z=-2.968$, $p=0.002$) and when interviewed by international civil party lawyers (compared to when interviewed by Cambodian civil party lawyers) (differences in perceptual processes: $z=-2.817$, $p=0.003$; differences in hearing: $z=-2.675$, $p=0.005$).

Table 7
Differences in linguistic variables related to parties to the proceedings and nationality (according to the analysis of the Linguistic Inquiry and Word Count)

	Judges			Prosecutors			Civil Party Lawyers			Defense Counsels		
	Cam- bodian (N=22) M/(SD)	Inter- national (N=20) M/(SD)	Sign.	Camb- odian (N=20) M/(SD)	Inter- national (N=18) M/(SD)	Sign.	Cam- bodian (N=20) M/(SD)	Inter- national (N=19) M/(SD)	Sign.	Cam- bodian (N=18) M/(SD)	Inter- national (N=15) M/(SD)	Sign.
WC	3290.89 (2487.35)	1145.03 (1043.43)	$z=-2.987$ $p=0.002$	441.20 (215.55)	650.67 (452.70)	n.s.	430.03 (194.73)	544.04 (266.25)	n.s.	437.56 (324.61)	678.73 (509.35)	n.s.
affect	1.68 (0.69)	2.55 (1.43)	$z=-2.539$ $p=0.009$	1.97 (1.64)	2.99 (1.38)	$z=-2.172$ $p=0.028$	2.75 (1.13)	3.01 (1.32)	n.s.	2.61 (1.50)	3.1 (1.89)	n.s.
<i>posemo</i>	0.90 (0.56)	1.26 (0.77)	$z=-2.203$ $p=0.027$	0.70 (0.64)	1.53 (1.00)	$z=-3.051$ $p=0.001$	1.46 (0.72)	1.47 (1.00)	n.s.	1.28 (0.89)	1.61 (1.08)	n.s.
<i>negemo</i>	0.81 (0.41)	1.33 (0.92)	n.s.	1.31 (1.50)	1.52 (0.77)	n.s.	1.43 (0.86)	1.54 (0.68)	n.s.	1.52 (1.35)	1.48 (0.91)	n.s.
<i>anx</i>	0.09 (0.09)	0.29 (0.53)	n.s.	0.14 (0.22)	0.28 (0.28)	n.s.	0.28 (0.34)	0.24 (0.21)	n.s.	0.09 (0.20)	0.28 (0.59)	n.s.
<i>anger</i>	0.38 (0.24)	0.40 (0.33)	n.s.	0.50 (0.66)	0.68 (0.62)	n.s.	0.49 (0.37)	0.72 (0.54)	n.s.	1.07 (1.31)	0.58 (0.47)	n.s.
<i>sad</i>	0.11 (0.10)	0.16 (0.19)	n.s.	0.21 (0.52)	0.12 (0.24)	n.s.	0.27 (0.29)	0.17 (0.20)	n.s.	0.16 (0.32)	0.31 (0.50)	n.s.
cogmech	15.96 (1.89)	18.07 (1.98)	$z=-2.670$ $p=0.006$	18.13 (3.04)	19.14 (4.02)	n.s.	19.73 (3.98)	19.38 (2.38)	n.s.	19.35 (4.16)	19.00 (2.51)	n.s.
<i>insight</i>	1.93 (0.44)	2.70 (1.06)	$z=-2.912$ $p=0.002$	2.87 (1.74)	2.39 (1.32)	n.s.	2.92 (1.53)	2.88 (1.14)	n.s.	3.10 (1.34)	3.14 (1.19)	n.s.
<i>cause</i>	1.18 (0.29)	1.73 (0.72)	$z=-2.576$ $p=0.008$	1.19 (0.83)	1.61 (0.76)	$z=-1.965$ $p=0.051$	1.81 (0.79)	1.66 (0.81)	n.s.	1.98 (1.15)	1.73 (0.64)	n.s.
percept	1.41 (0.63)	1.94 (0.96)	$z=-2.352$ $p=0.017$	2.11 (1.03)	2.06 (1.62)	n.s.	1.77 (1.20)	2.66 (1.29)	$z=-2.817$ $p=0.003$	1.92 (1.09)	1.32 (0.60)	n.s.
<i>see</i>	0.77 (0.51)	0.87 (0.65)	n.s.	1.10 (0.69)	1.08 (1.03)	n.s.	0.70 (0.61)	0.95 (0.73)	n.s.	0.99 (0.54)	0.62 (0.52)	n.s.
<i>hear</i>	0.36 (0.29)	0.79 (0.54)	$z=-2.968$ $p=0.002$	0.74 (0.81)	0.77 (0.90)	n.s.	0.64 (0.54)	1.17 (0.76)	$z=-2.675$ $p=0.005$	0.77 (0.89)	0.55 (0.36)	n.s.
<i>feel</i>	0.21 (0.19)	0.18 (0.26)	n.s.	0.23 (0.30)	0.20 (0.28)	n.s.	0.31 (0.34)	0.50 (0.56)	n.s.	0.14 (0.26)	0.12 (0.15)	n.s.

Differences in linguistic variables related to parties to the proceedings and gender

- In general, answers to male law enforcement personnel were longer. However, the more specific nonparametric two-related samples tests showed that these effects were driven by answers to male judges in comparison to female judges ($z=-2.934$, $p=0.001$).
- Overall, witnesses used more cognitive process and insight words when interviewed by female law enforcement personnel than when interviewed by male law enforcement personnel. However, when controlling for membership to different parties to the proceedings, nonparametric two-related samples tests revealed no significant differences.

Table 8
Differences in linguistic variables related to parties to the proceedings and gender (according to the analysis of the Linguistic Inquiry and Word Count)

	Judges			Prosecutors			Civil Party Lawyers			Defense Counsels		
	Cambodian (N=22) M/(SD)	International (N=20) M/(SD)	Sign.	Cambodian (N=20) M/(SD)	International (N=18) M/(SD)	Sign.	Cambodian (N=20) M/(SD)	International (N=19) M/(SD)	Sign.	Cambodian (N=18) M/(SD)	International (N=15) M/(SD)	Sign.
WC	3290.89 (2487.35)	1145.03 (1043.43)	$z=-2.987$ $p=0.002$	441.20 (215.55)	650.67 (452.70)	n.s.	430.03 (194.73)	544.04 (266.25)	n.s.	437.56 (324.61)	678.73 (509.35)	n.s.
affect	1.68 (0.69)	2.55 (1.43)	$z=-2.539$ $p=0.009$	1.97 (1.64)	2.99 (1.38)	$z=-2.172$ $p=0.028$	2.75 (1.13)	3.01 (1.32)	n.s.	2.61 (1.50)	3.1 (1.89)	n.s.
<i>posemo</i>	0.90 (0.56)	1.26 (0.77)	$z=-2.203$ $p=0.027$	0.70 (0.64)	1.53 (1.00)	$z=-3.051$ $p=0.001$	1.46 (0.72)	1.47 (1.00)	n.s.	1.28 (0.89)	1.61 (1.08)	n.s.
<i>negemo</i>	0.81 (0.41)	1.33 (0.92)	n.s.	1.31 (1.50)	1.52 (0.77)	n.s.	1.43 (0.86)	1.54 (0.68)	n.s.	1.52 (1.35)	1.48 (0.91)	n.s.
<i>anx</i>	0.09 (0.09)	0.29 (0.53)	n.s.	0.14 (0.22)	0.28 (0.28)	n.s.	0.28 (0.34)	0.24 (0.21)	n.s.	0.09 (0.20)	0.28 (0.59)	n.s.
<i>anger</i>	0.38 (0.24)	0.40 (0.33)	n.s.	0.50 (0.66)	0.68 (0.62)	n.s.	0.49 (0.37)	0.72 (0.54)	n.s.	1.07 (1.31)	0.58 (0.47)	n.s.
<i>sad</i>	0.11 (0.10)	0.16 (0.19)	n.s.	0.21 (0.52)	0.12 (0.24)	n.s.	0.27 (0.29)	0.17 (0.20)	n.s.	0.16 (0.32)	0.31 (0.50)	n.s.
cogmech	15.96 (1.89)	18.07 (1.98)	$z=-2.670$ $p=0.006$	18.13 (3.04)	19.14 (4.02)	n.s.	19.73 (3.98)	19.38 (2.38)	n.s.	19.35 (4.16)	19.00 (2.51)	n.s.
<i>insight</i>	1.93 (0.44)	2.70 (1.06)	$z=-2.912$ $p=0.002$	2.87 (1.74)	2.39 (1.32)	n.s.	2.92 (1.53)	2.88 (1.14)	n.s.	3.10 (1.34)	3.14 (1.19)	n.s.
<i>cause</i>	1.18 (0.29)	1.73 (0.72)	$z=-2.576$ $p=0.008$	1.19 (0.83)	1.61 (0.76)	$z=-1.965$ $p=0.051$	1.81 (0.79)	1.66 (0.81)	n.s.	1.98 (1.15)	1.73 (0.64)	n.s.
percept	1.41 (0.63)	1.94 (0.96)	$z=-2.352$ $p=0.017$	2.11 (1.03)	2.06 (1.62)	n.s.	1.77 (1.20)	2.66 (1.29)	$z=-2.817$ $p=0.003$	1.92 (1.09)	1.32 (0.60)	n.s.
<i>see</i>	0.77 (0.51)	0.87 (0.65)	n.s.	1.10 (0.69)	1.08 (1.03)	n.s.	0.70 (0.61)	0.95 (0.73)	n.s.	0.99 (0.54)	0.62 (0.52)	n.s.
<i>hear</i>	0.36 (0.29)	0.79 (0.54)	$z=-2.968$ $p=0.002$	0.74 (0.81)	0.77 (0.90)	n.s.	0.64 (0.54)	1.17 (0.76)	$z=-2.675$ $p=0.005$	0.77 (0.89)	0.55 (0.36)	n.s.
<i>feel</i>	0.21 (0.19)	0.18 (0.26)	n.s.	0.23 (0.30)	0.20 (0.28)	n.s.	0.31 (0.34)	0.50 (0.56)	n.s.	0.14 (0.26)	0.12 (0.15)	n.s.