"go on cam but dnt be dirty": linguistic levels of identity assumption in undercover online operations against child sex abusers

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Abstract. *One way in which linguists have been able to offer their expertise to undercover online policing in England and Wales is assisting police officers in the assumption of alternative identities in order to apprehend offenders in the context of the online sexual abuse and grooming of children. With reference to the historical Instant Messaging (IM) logs of a teenage female victim in a closed case of online sexual abuse, and the IM logs of trainee undercover officers (UCOs) as they attempt to impersonate her during a training task, we report here on work that draws on analyses of online interactions to develop a linguistic model that can be used to improve performance in identity disguise. We compare trainees' performance before and after input from linguists in order to show how analysis at a number of linguistic levels can contribute to the training and support of specialist investigators of online child sex abuse.*

Keywords: *Computer mediated discourse, online child sex abuse, undercover policing, identity disguise, authorship synthesis, assuming identities online.*

Resumo. *Uma das maneiras pela qual linguistas têm colaborado dentro de suas especialidades com o policiamento secreto online, na Inglaterra e País de Gales, é oferecendo assistência a operações nas quais agentes precisam assumir identidades alternativas para capturar criminosos envolvidos em abuso sexual online e aliciamento de crianças e adolescentes. Tomando-se como referência logs de mensagens instantâneas (MI), provenientes de uma vítima adolescente do sexo feminino, de um caso encerrado de abuso sexual online, bem como logs de MI provenientes de agentes disfarçados enquanto estes tentavam representar o papel de tal vítima, relata-se aqui um trabalho baseado na análise de interações online para o desenvolvimento de um modelo linguístico utilizável na melhoria da desempenho no disfarce de identidade. Compara-se a performance dos agentes em treinamento antes e depois da colaboração dos linguistas afim de demonstrar como a análise pode contribuir em diversos níveis linguísticos para o treinamento e apoio aos investigadores especializados em abuso sexual de crianças e adolescentes online.*

Palavras-chave: *Discurso mediado por computador, abuso sexual de crianças online, policiamento secreto, disfarce de identidade, síntese de autoria.*

Introduction

One consequence of the development of communication media has been the enhanced potential for the planning and committing of criminal activity. Internet and mobile communication technologies have revolutionised the activities of some criminal groups in much the same way as they have for the general public. For example, child sex offenders now have direct and easy access to potential victims for grooming and sexual exploitation, and have made use of these channels to target children and facilitate networking with other offenders in order to propagate abusive imagery (Rashid *et al.*, 2012). Thus, the issue of identity and influence within transnational online communities has become a significant social and policing concern. As noted by Barber and Bettez (2014), research that focuses on the process of online exploitation is scarce – research focussing specifically on the *linguistic* aspects of these processes is presumably even scarcer (see Chiang and Grant, 2017; Chiang and Grant, forthcoming. Through links with policing partners, the authors have been involved in the UK national 'Pilgrim'[1] training programme for specialist online undercover officers (UCOs) for the past five years. The linguistic input comprises a three- to four-hour session covering aspects of vocabulary, orthography, pragmatics and topic development, and the relevance of these key concepts for the practicalities of adopting an alternative persona online. Trainees are then introduced to a pro-forma developed to assist them in analysing and describing a target linguistic persona (see Figure 1). They have two hours to prepare for a roleplaying activity in which they are tasked with assuming the identity of a 14-year-old girl who has been discovered to be interacting online with an unknown male whom she is planning to meet for sexual activity. In other words, they must engage in a process of 'authorship synthesis'. Trainees are instructed to read the victim's historical chat logs before engaging the target in an IM chat. The historical log is some thirty pages long and comprises several chats between the victim and the offender, with the latter using three different identities across the conversations. Assuming the second identity, the offender begins by blackmailing the victim into performing sexual acts on webcam, issuing threats to publish intimate photographs if she does not comply. The conversation subsequently becomes less overtly threatening. The victim's chats with all three offender identities involve sexual chat and the performance of sexual acts on webcam.

Assuming the Linguistic Persona

Vocabulary	Freq	Spelling abbreviation rules	Openings	Closings
Word: Variants				
Word: Variants				
		Pragmatics Notes		Line length and line breaks
Word: Variants		Assertives		
Word: Variants		Directives	Topic Control	
			Topics initiated	Topics responded to or developed / Topics declined or with minimal responses
Word: Variants		Commissives		
Invariant forms		Interrogatives		
		Expressives /Acknowledgments		

Figure 1. Linguistic Persona Pro-Forma.

As well as noting down the target persona's tendencies regarding spelling and vocabulary, Pilgrim participants are provided with space to record their observations on her pragmatic, discursive and interactional behaviour. Having been introduced to speech act theory (Austin, 2000; Searle, 1969) and the illocutionary nature of language, trainees are encouraged to record details of this aspect of the target user's language throughout the chat log. Kost (2008) notes that there is a wide array of discursive and interactional moves available to participants in synchronous online interaction, including those for topic initiation and expansion. Since some knowledge of which topics the target persona has been recorded as having initiated, responded to, maintained and rejected – and the strategies she uses to perform these tasks – is arguably a crucial component of her linguistic style, these are also included on the pro-forma, along with space for describing her turn lengths, openings and closings.

By collecting as much information as possible about an individual's linguistic behaviour in the areas of vocabulary, pragmatics and topic control, the trainees equip themselves for the purposes of describing, and potentially impersonating that individual at a later stage. Information about what is variable in a target's linguistic behaviour is collected alongside what appears to be invariable. Following their preparation time trainees begin the authorship synthesis, engaging in an IM conversation lasting around an hour with an instructor roleplaying the part of the offender in order to set up a location for meeting so that an arrest can be made. They are also required to establish that the offender is aware of the child's age, and that sexual activity is planned. Their performance from a linguistic perspective then forms a key component of their debriefing session, which is delivered by both the instructor-roleplayers and ourselves.

The task of impersonating another individual online is a cognitively demanding one, and a cursory glance at data we have from genuine undercover operations and from

Darkweb fora reveals a default position on the part of already suspicious offenders that the person to whom they are talking may well not be who they say they are.

Extract 1: Suspicion of identity disguise on the Darkweb

```
11/26/15 9:58 PM  Username 1  im a 14 f
11/26/15 9:59 PM  Username 2  whatever you say Officer Username 1
[...]
12/10/15 3:52 PM  Username 3  I just want to pm pics for a good vid
                              site
12/10/15 3:53 PM  Username 2  if they enter room wanting to pm odds
                              are they are LEA
[...]
12/15/15 5:08 AM  Username 4  let me rephrase...ONLY PM me if you
                              are into private trade
12/15/15 5:10 AM  Username 2  no thanks officer Username 4
```

Extract 1 shows the individual 'Username 2' flagging particular behaviours – such as claiming to be a teenage girl or requesting PM (private message) chats – as indicative of an individual being 'LEA' (a Law Enforcement Agent). For obvious reasons, members of these online communities are constantly on their guard, regarding all their interlocuters with suspicion. Although we have no specific examples across our datasets of UCOs' cover being blown, it seems safe to assume that this is because such a discovery would lead to an immediate end to interactions, and thus a lack of data.

The central purpose of this article is to evaluate our linguistic training input and identify potential areas for development in order to better aid specialist investigators in online identity assumption tasks.

Computer Mediated Discourse (CMD)

Recent years have seen linguistic researchers taking a keen interest in online human behaviour, an interest that has undoubtedly been aided by the comparative ease with which online activities can be stored, accessed and analysed, and subjected to scrutiny in ways that perhaps spoken communication cannot Herring (2004: 338).

As Postmes *et al.* (2000) point out, the once popular idea that there are fixed effects on human interaction determined by the medium of communication used to engage in it has given way to a focus on the diversity of the effects of the medium. Whereas early researchers in computer mediated discourse (CMD) tended to oversimplify, characterising what they termed 'interactive written discourse' as a single genre, subsequent research has revealed computer-mediated language and interaction to be sensitive to a variety of technical and situational factors (Herring, 2007: 3). The view of online language as a homogenous variety has since given way to an understanding of CMD as comprising a number of modes which can be classified according to features of the medium as well as social factors (Seargeant and Tagg, 2011). Thus, more recent work in the area has focussed on the complexities of sociolinguistic factors observable in CMD, rather than on making broad generalisations about the nature of 'netspeak' or 'internet English'. CMD is generally recognised as consisting of features typical of both face-to-face interaction (immediacy, informality, reduced opportunities for planning and editing) with qualities of written modes (lack of visual and paralinguistic cues, physical distance between interactants) (Georgakopoulou, 2011).

There existed for some time a trend for anecdotal research in the area of CMC, rather than for work with a robust empirical grounding (see, for example, Crystal, 2001. Addressing these perceived shortcomings, Herring (2007) proposes a 'faceted' system for the classification of CMD, which is a core component of her methodological toolkit (2004; 2014) for CMD analysis (CMDA). Structurally, CMD can be defined in terms of two basic parameters. The first is synchronicity. In synchronous (or 'real time') CMD, transmission is essentially instantaneous, and interlocutors are assumed to be physically present to read and respond to messages, whereas in asynchronous CMD, neither of these assumptions holds. The second parameter is whether the communication is one-to-one (i.e., between two people) or many-to-many (i.e., multiple participants' messages being broadcast to multiple potential interlocutors) (Baron, 2010). Further linguistic variation can be found between forms of CMD on the basis of other factors relating to situation and to medium (see Herring, 2007 for an overview).

Like Herring, we draw interpretations from the data grounded in observations about language use, and take an interest in how language structure, meaning and use vary throughout the dataset. We understand CMDA as applying to four levels of language – structure, meaning, interaction, and social behaviour. It is from this understanding that the pro-forma discussed above was developed. At the structural level aspects of lexis and spelling are included; at the level of meaning trainees are encouraged to record their observations about an individual's use of particular speech acts; and at the level of interaction, attention is paid to which topics are introduced, maintained or rejected by the target individual, as well as to turn length, and to the openings and closings that occur in the historical chat logs. We understand online interactions as having a pivotal role to play in identity construction, and we discuss our theoretical position on language and identity at great length elsewhere (see for example Grant and MacLeod, forthcoming).

Data

The current research is concerned primarily with the synchronous, generally one-to-one medium of Instant Messaging (IM), described by Al-Sa'Di and Hamdan (2005) as resembling spoken English to a great extent, with immediate replies expected from one's interlocutor, echoing the turn-taking system of face-to-face conversation. They further note that features traditionally thought of as typical of 'netspeak' – such as word truncation, lack of capitalisation and punctuation and non-verbal stylisation – do occur, but they are not universal features of all users' online language. Perhaps unsurprisingly, there is a tendency for undercover operatives before training to rely heavily on these linguistic stereotypes, whether about particular social categories, i.e. 'adolescent girls', or about users of IM, or the medium of IM itself (see Androutsopoulos, 2006.

The data drawn on here are chat logs of conversations between trainee officers and their instructors, collected via the Yahoo! Chat client during the Pilgrim roleplay exercise discussed above. The data comprise two sets of instant messenger chat logs between an experienced UCO instructor, playing the part of the suspected would-be offender, and either one or two trainees in each case, posing as the victim. One set was collected prior to any linguistic training being received, while the other was collected from the same trainees three months later after our input on vocabulary choice, topic control and pragmatic function. The necessary ethical approval was gained from the host institution,

committing us to preserving anonymity, ensuring secure storage, and providing emotional support for the researchers via the same counsellor that works with the UCOs themselves.

In the 'Before' set there are five chats involving a single trainee author and one with two trainee authors, with the point at which one takes over from the other clearly marked in the text. In the 'After' set there are six conversations, all of which are produced by two trainee authors with the point at which one takes over from the other clearly marked in the text (the instruction to swap over is explicitly provided by the instructor around half way through the conversation). The length of the conversations ranges from three to nine sides of A4, spanning around an hour and a half for each conversation.

Feature taxonomy

Work the authors have previously conducted on the analysis of the authorship of online communications (MacLeod and Grant, 2012) provided a starting point for the structural linguistic features selected for attention in the current study. These are displayed in Figure 2 below.

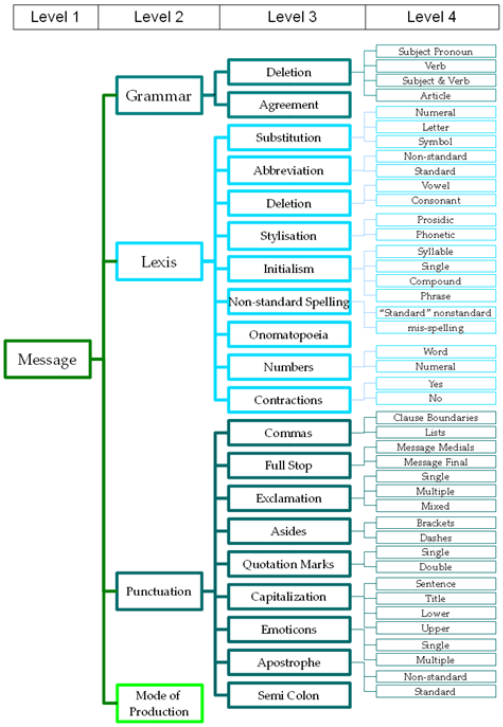

Figure 2. Feature Taxonomy (from MacLeod and Grant, 2012).

Although this original taxonomy has been substantially developed and modified since the earlier research, it covers the key structural feature types and provided a sound point of departure for the current work.

The 'pragmatics' input is derived from Speech Act theory (Austin, 2000; Searle, 1969), and later developments by Woodhams and Grant (2006) relates to a speaker/ writer's intended purpose in producing an utterance, and the utterance's function in the context of the on-going interaction. The categories identified in the current data are as follows:

- Assertives: Statements that have the potential to be 'true' or 'false' because they aim to describe a state of affairs in the world.
- Directives: Statements that attempt to make the other person's actions fit the propositional content. *Examples: requests, commands, demands, etc.*
- Commissives: Utterances that commit the speaker to a future course of action as described by the propositional content. *Examples: promises, threats.*
- Interrogatives: Requests for information, usually in the form of a question.
- Expressives: Utterances that express an attitude i.e. some attitude or feeling e.g. wanting, liking, hating, swearing, expressions of surprise, etc or which express an evaluation, *e.g. 'lol', 'cool', and the full range of emoticons.*
- Acknowledgements: Statements that acknowledge another participants' contribution. This is included to account for the minimal receipt turns observable in the data, *e.g. 'OK?, 'Yes'.*

Moving on to topic management, it should firstly be noted that there are strong operational reasons for accurate performance in this regard. While an undercover officer might leave themselves open to accusations of entrapment or acting as *Agents Provocateurs* if seen to instigate sexual topics while acting the part of the child victim, this risk is mitigated if it can be shown that this does in fact form part of the child's usual online behaviour. Failure to act as such, it could be argued, risks alerting the perpetrator to the undercover replacement.

Structure

An overview of the victim's historical choices in relation to a selection of the (mostly structural) features identified in Figure 1 and Figure 2 appears in Table 1 below.

Feature	**Examples used by victim**
Initialisms	brb; nm (not much); tbh
Omission	yh; dnt ; wht; dwnstairs; bk; pls
Shortenings	sis; pics; probs; sec; convos; morro; cause; cuz (for cousin); cam
Emoticons	:L
Substitutions	u; r; y
Prosodic stylisation	noooo; noo; plsss
Phonetic stylisation	yup; yeah; thanx; aint (but also haven't); nahh; nope; outta; dunno; gunna; wanna; sorta; kinda
Misspellings	there (for they're); too (for to); of (for have)
g-clipping	lookin; fingerin; tossin; (BUT nothing (x3); minging; anything; putting; doing (x2); showing; leaving; blackmailing; watching; talking; fucking; sorting; something; working; joking)
Terms of address	babe; sexy
Openings	hey hey; woah sexy

Table 1. Victim's vocabulary and spelling choices.

Further to these, the victim consistently omits apostrophes and does not capitalise any letters, including the first person pronoun. She occasionally marks questions with a question mark, marking them with two to indicate surprise, but this is by no means consistent and many questions are not marked. There are no commas or full stops anywhere throughout the victim's contributions. She occasionally uses kisses, represented with [x].

Space prohibits a full discussion of all the features listed above, but the following have been selected for closer investigation: variant ('phonetically stylised') spellings of 'yes', 'no' and 'what', and g-clipping.

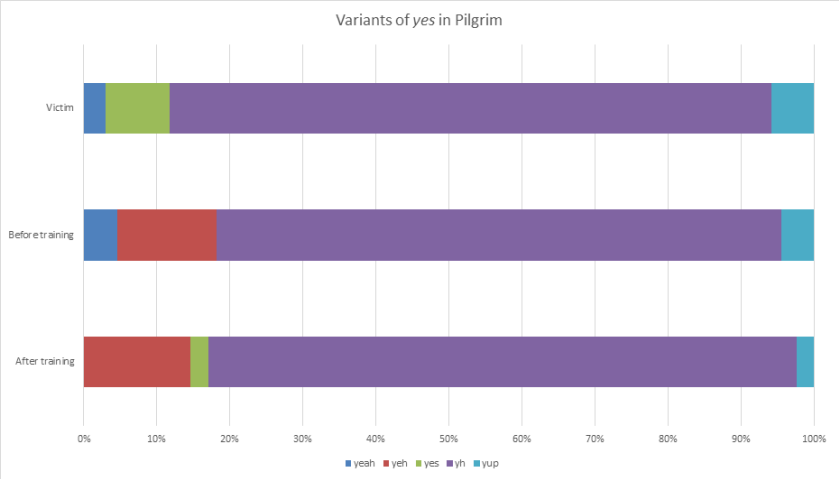

Figure 3. Variants of 'yes'.

As Figure 3 shows, the victim's preferred variant is 'yh' yes, with the standard 'yes' accounting for 9% of instances of the word. This is followed by 'yup' and lastly 'yeah'. Before linguistic input from the authors, trainees do display an awareness of the victim's preference for 'yh', but this awareness is not matched when it comes to the rarer variants. The victim's use of the standard 'yes' has not been picked up at all by any of the trainees before linguistic input. Instead, the variant 'yeh' – never used by the victim – accounts for 14% of their renderings. After the authors' input on linguistic analysis, trainees not only increased their use of the preferred variant *yh* to be in line with the victim's patterns, but also introduced the standard variant *yes*. However, the variant *yeh*, nowhere to be found in the victim's chatlog, nevertheless maintains its position as the second most preferred in the trainees' chats. One possible explanation for this, as discussed earlier, is that trainees continue to rely on stereotypes during the impersonation task, even after training. While the authors' input has challenged these practices (leading to the appearance of the standard 'yes', which was not found in the 'before' set), it has not done so to the extent that the non-standard and arguably stereotypically 'netspeak' form 'yeh' has been noted as absent and omitted accordingly.

This possibility is supported by the prevalence of particular initialisms in the data. A total of three initialisms are present in the victim's chat – *brb* for *be right back*, *nm* for *not much*, and *tbh* for *to be honest*. Each of these items occurs just once in her historical data. Before linguistic input however, Pilgrim trainees display a tendency to overuse particular initialisms, most notably *lol* for *laugh out loud*, which occurs in the chat of five out of

the seven trainees. Considering the item never appears in the victim's genuine chat, this tendency arguably has the potential to alert an offender to the possibility of disguise. After input from the authors, the occurrence of *lol* drops substantially, occurring only once across the chats of the 'after' set. Thus, there is a clear improvement in performance in this regard following training.

There are a total of ten variant spellings of no in the data, and of these the victim makes use of five. These are displayed in Figure 4.

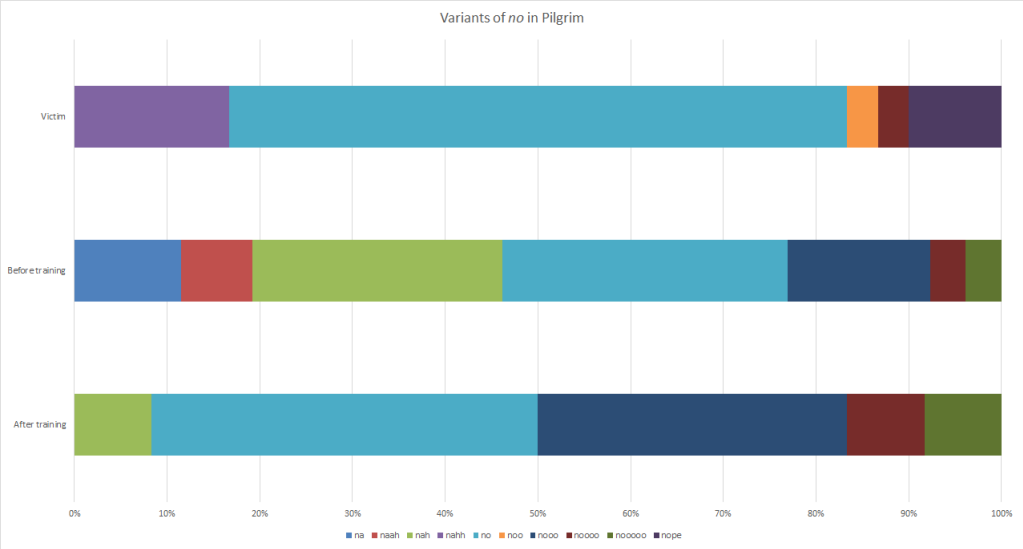

Figure 4. Variants of 'no'.

As Figure 4 shows, the victim's preference is for the standard *no*, although she phonetically stylises the item in around a third of instances, her favoured stylisation being *nahh*. Prior to the authors' input, the group of trainees makes use of no fewer than seven variant spellings. As with *yes*, the most frequent variant matches that of the victim (*no*), but this does not account for as large a proportion of occurrences as it does in the victim's historical data. Furthermore, the second most frequent variants – *nooo* and *nah* – do not appear in the victim's chat at all. Lastly, there are no occurrences of *nahh* or *nope* in the 'before' set, which together account for over a quarter of the victim's occurrences of the variable.

The trainees' proportional use of the standard *no* has increased after training, bringing the number closer to that evident in the victim's chat. However, the second most frequent variant is *nooo*, which as mentioned earlier does not occur at all in the victim's historical transcript. The broad effect of training on these variable spellings, then, appears to be that while trainees' awareness of the use of standard forms becomes raised, they nevertheless continue to struggle with choosing appropriate rarer forms.

The same is not true for another variable spelling that appears numerous times across the data, that of *what*. Of sixteen occurrences of the item in the victim's chat history, she invariably spells it *wht*.

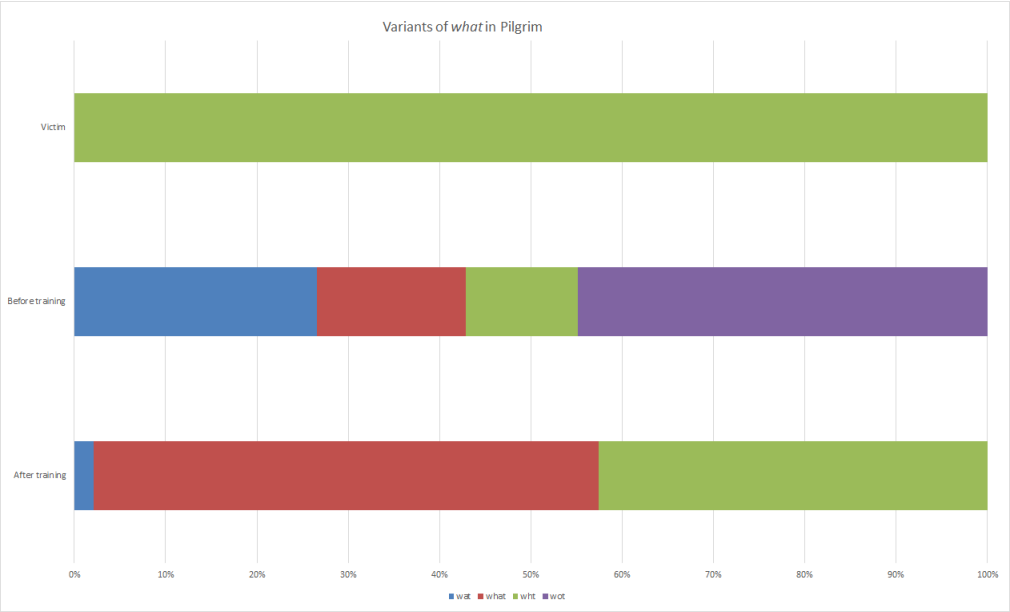

Figure 5. Variants of 'what'.

Evidently the training input has made improvements to trainees' performance when it comes to this variable feature – as well as losing completely the variant *wot* – previously the most frequent variant and yet nowhere to be found in the victim's chat, they increase their use of the variant *wht* – most frequent in the victim's chat – from 12% to 43%. It is nevertheless disappointing to note that the standard variant *what*, though never present in the victim's chat, accounts for the majority of occurrences in the trainees' chats post-training.

Another structural feature of internet language that is arguably stereotypical is that of g-clipping, i.e. the omission of the letter *g* in word-final position of present participles and gerunds. As Figure 6 shows, this is a feature that is evident in the victim's chat in 18% of possible instances, but her overwhelming preference is for including the *g*.

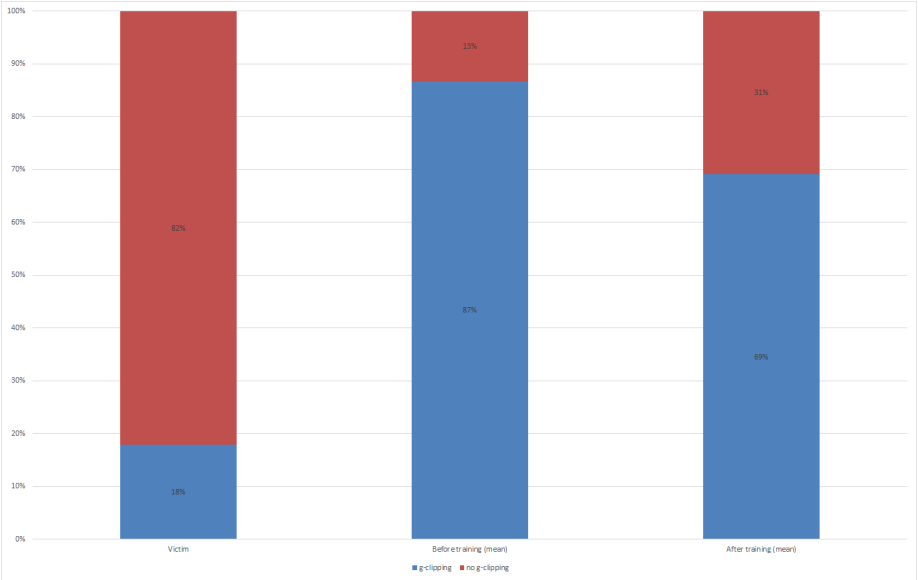

Figure 6. g-clipping.

Before receiving any input on linguistic analysis, trainees display an obvious preference for g-clipping, doing so in almost 90% of cases on average. The authors’ input seems to have some effect on this, bringing the figure down to just under 70%. This is still a long way from the victim’s 20:80 split, but is a move in the right direction.

Meaning

In line with the domains of language use identified in the linguistic training pro forma, we also focussed on pragmatic aspects of the victim’s language use, namely the distribution of different speech acts. In the initial sessions with the offender’s first identity, the victim uses a mixture of assertive statements: ‘*shes on wii with mum*’, minimal acknowledgements of the offender’s contributions, and occasional questions: ‘where u live?’ and directives: ‘go on cam but dnt be dirty sis is next to me’.

When confronted by the offender’s second identity and threats to publish intimate pictures, she responds with a series of interrogatives: “why are u on my fb?”; “wht do u want then”. There are also a number of directives here in the form of pleading requests: “yes just pls dont post them” and assertives “i do have 2 sisters 4 and 7”. There then follows a sexually explicit exchange with the offender’s second identity consisting on the victim’s side of mainly assertives and minimal acknowledgements. There are also expressives here: “i wanna fuck u”; “this feels good” and commissives: “yh want me too use something too finger”. The final conversation in the log, between the victim and the offender’s third identity, consists for the victim mainly of assertives with some interrogatives: “do i know u”; “u off tagged?”.

Prior to training the UCOs showed very little awareness of potential variation in speech act use, and neither their notes nor our own observations showed evidence that they considered this in their preparation for engagement. Perhaps due to this lack of awareness, the trainee group shows considerable individual variation during their assumption of the girl’s identity. Several trainees, for example, used a high proportion of interrogatives as they attempted to confirm a time and location for the meeting with

the offender, and to elicit his phone number. This contrasts with the victim's historical chat, where there tended to be a more even mix of speech acts, (with the exception as noted with the start of the conversation with the offender's second identity). For other trainees, there is a clear difficulty in playing the role of the victim and using directives. In the historic chat the girl issues a number of commands to the offender, including directing him in online sexual activity. Another aspect where the trainees performed less well was in their use of expressives as a way of deflecting the apparent suspicion of the offender.

Where some trainee UCOs clearly struggled to consistently assume the girl's identity against these pragmatic criteria, others naturally performed better. One trainee was observed to use a fairly high but appropriate number of utterances that were classified as directives in terms of their primary function (although note that many of these might appear on the surface to be assertives or expressives): "i wana meet u propa"; "giv me ur numba"; "wana lose my virginity", and also a number of interrogatives: "who r u agan", "how will i kno its u". The way these were used was in keeping with the victim's online identity as recorded in the historic chat logs.

This variation in ability to assume the victim's identity at the pragmatic level clearly marks a training need, and post-training there was more consistency with the historic chat logs. There were, however, some individual UCOs who clearly struggled with their analysis and performance at this pragmatic level, even post-training. The most competent trainees could be observed in the preparation phase of the simulated operation to refer back to our linguistic input, and attempt to understand better the way the victim used language in the interactions. In our feedback to the trainees we noted for one UCO "A good mix of assertives, directives and commissives, in keeping with the style of the victim. The interrogatives are well spaced, and refer to the proposed sexual activity that evening as well as to travel arrangements and requesting contact details". Conversely, other trainees persist in using extended runs of interrogatives that are not generally characteristic of the historic chat – but are, of course, characteristic of investigative interviews. This tendency may well relate to the operational task of intelligence gathering, but nevertheless represents a point of difference between the actual persona of the girl and the UCO assuming that persona. As such it marks a point of potential discovery.

Interaction

Finally, we examined the interactional patterns of the victim's language through an analysis of topic management. As discussed above, a willingness to engage in conversation about sexual topics may seem counter-intuitive and dangerous to an investigator impersonating a person under the age of consent, but can be a fundamental component of impersonation. The extent to which avoidance of particular topics can alert interlocutors to the possibility of disguise is discussed later in the article. The victim's behaviour in this regard is summarised in the table below.

Topics initiated	**Topics responded to / developed**	**Topics declined**
Sexual contact with offender	Video conversation – clothing and sexually explicit content	Teasing (sister in room)
Own sexual arousal and use of objects	Offender's 'hacking'	Sexual activity involving sister
Own appearance and appearing on cam	Sister	
	Offender's instructions for sexual behaviour on camera	
Offender's location, health, appearance, motive for blackmail		

Table 2. Victim's topic management.

We now move on to an examination of patterns of topic management in the trainee chat logs prior to linguistic input, which demonstrate significant differences to the target persona described above. In the historic chat log the girl introduces sexual topics and sexual activity on several occasions. In all but one case the trainee UCO failed to do this. For some trainees, not only did they not initiate sexualised conversation, but they declined it when it was instigated by the 'offender'. This natural reluctance to engage in online sexual activity whilst performing as a 14 year old girl needs overcoming in these tasks, yet some trainees find this difficult to achieve. An explicit learning objective of the simulation exercise is to facilitate officers doing this more easily whilst staying within their authorisation, and avoiding going further than activity and discussions evident in the historic chat.

Topics initiated	**Topics responded to / developed**	**Topics declined**
Sexual chat (only one trainee initiated sexual chat)	Cameras	Sexual activity
Meeting including location of meeting, time of meeting, travel arrangements etc.	Victim's clothing	Victim's arousal
Offender's phone number and location	Some sexual talk, planned sexual acts, masturbation, arousal, sexual activity	Victim's masturbation, oral sex, anal sex
Experience of 14 yr olds		Putting webcam on
Offender's clothing and description, offender's name		
Offender's arousal		
Being nervous		

Table 3. Pre-training topic management.

A further feature of the pre-training chat is the nature and quantity of initiated topics which are of operational interest to the UCOs. These types of operation are extremely demanding, and UCOs need to focus on a number of tasks simultaneously. They must try to obtain information about the offender which might identify them; they must be explicit about the child's age and establish intention to engage in sexual activity in order to ensure that the act falls within the terms of the Sexual Offences Act 2003 s. 15. Furthermore, they are instructed to try and arrange a location to meet away from other children who might be endangered by a sexual predator, and attempt to get a description of the offender so that they can be easily recognised at the meeting place. All these tasks may create points of inconsistency with the child's previous conversations and it is part of the skills that the officers develop to work these new topics naturally into the conversations, while simultaneously maintaining a linguistic identity consistent with the child's.

After training the officers showed consistent improvement in this area and particularly appreciated how the language analysis can protect against accusations of acting as an *agent provocateur*. As can be seen in Table 7 the points of inconsistency typically involved introduction of the operational issues as discussed above. In both pre- and post-training chats an additional operational issue was that the trainees did not respond to attempts by the 'offender' to start a webcam conversation, activity in which for obvious reasons they could not engage in during a genuine operation.

Topics initiated	**Topics responded to / developed**	**Topics declined**
Sexual activity (much more apparent across all trainee UCOs)	Travel and plans for the evening	Sharing webcam
Offender's arousal	Proposed sexual activity	Possible phone call
Present from offender	Location of meeting / hotel	
Victim's mum – an argument with the mother was proposed as a reason why the victim could not access her mobile phone	Sexual activity talk	
Travel arrangements	Victim's location	
Offender's clothing		
School uniform		
Victim's virginity		
School in morning		
Being nervous		
Offender's number		

Table 4. Topic control post-training.

What arouses suspicion?

Other research we have conducted (see Grant and MacLeod, 2016) indicates that changes at the structural level, for example spelling and punctuation, are the easiest to spot, and arouse suspicion in individuals looking out for impersonation. Furthermore, the results presented above show that impersonators, after input from linguists, are able to make substantial improvements to their language patterns in this regard. Below is a selection of examples taken from roleplayers' chats in the *before* set that indicate they may be flagging linguistic behaviour that has the potential to alert a genuine target to the deception. **Bold** indicates that the issue may have to do with structural issues such as spelling and/or vocabulary choices, underlining indicates that the problem seems to be with topic and *italics* indicate that the issue is with pragmatic force.

- i can tell ur on ur best behavor **cuz ur typin is** betta than norm
- what's wrong wif you today? (In response to limited sexual talk and *persistent questioning* about meeting location and target's phone number)
- you *askin* a lot today; whats up wiv u you aint not been horny wiv me b4 is summat wrong; wtf y u no talk sexy wiv me; who are u? you taked and played sexy b4
- why you keep *asking* who i am?

In the chat log text there were few explicit challenges regarding the structural level of analysis – spellings, punctuation abbreviations, etc. – although in the instructor's comments these aspects were clearly noted. One instructor notes "over use of text speak –

not so much in original" and another instructor notes "heavy use of punctuation". These comments match our own comparison with the historic chat logs in the pre-training condition and we can speculate that the instructors find it harder to call out the trainees on this aspect of their writing whilst within the roleplay of the simulation exercise. It is clear from these responses that roleplayers flagged up *pragmatic* and topic issues as being likely to cause suspicion, as well as **structural** features. These suggest an assumption by instructors that a target would be alerted by a higher than usual degree of interrogatives, for example, or by a reluctance to engage with sexual topics. Changes at the levels of meaning and interaction, then, are clearly an important area to be addressed.

The post-training set of interactions showed a reduction in structural level identity performance errors and none were commented on by the instructors in their evaluations in the post-training condition. Again, italics indicate where the problem appears to be one relating to *pragmatic* force and underlining indicates that the issue is with topic:

- ur annoying me wont cam *dictating* where I have to go
- u ok not like u not to talk dirty is this the sis or what?

There was a notable reduction in linguistically focussed challenges in the post-training condition and remaining challenges focused either on factual inconsistencies or behavioural differences observed by the instructors:

- you hurt ur hand, u got slower at typing?
- i fink ur avoiding me wont cam wont phone
- if u cant jump in taxi then u not gonna do stuff we talked about..watsa goin on wt u????

Slowness at typing, reluctance to use the webcam, speak to the target on the phone or take a taxi to a specified location are clearly not issues that can be addressed with linguistic training. Only two of the instructors picked up on linguistic issues – one each for topic management and pragmatics. This, combined with the improvements noted above, suggests a marked improvement in the trainees' ability to emulate the style of the victim.

Concluding remarks

This article has provided an insight into the linguistic mechanisms that operate during identity assumption, specifically in the operational context of UCOs assuming the identity of an adolescent female victim of online sexual abuse. The aims of the trial reported on here were to evaluate the usefulness of the linguistic model for adopting a persona and to determine when and on what basis instructors, playing the role of the offender, would detect or become suspicious of identity assumption by the trainee operative.

Prior to the linguistic training, the trainees tended to concentrate their efforts at identity assumption almost exclusively on mimicking vocabulary features they presumed occurred in the target style, but in doing so they overestimated her use of 'netspeak' or 'textspeak' spellings. Individual pragmatic patterns and topic management were almost entirely neglected. After training trainees were seen to use all the identified areas of linguistic analysis. Thus, training appears to have alleviated some of the usual stereotyping and contributed to a more evidence-based approach to this particular policing task.

The analyses presented above were supplemented with observations of trainees as they prepared for their roleplayed synthesis exercise, with the authors gaining exclusive access to the two-hour preparation period immediately prior to the simulated operation. These observations revealed that one positive effect of the linguistic input has been the increased prioritisation given to the language habits of the target persona, with linguistic issues tending to take up at least half of the total preparation time (the remainder being spent collecting together details such as the girl's school, information about her family, etc.).

The most recent improvement in the linguistic training offered to Pilgrim attendees is the continuing development of a software tool arising from the project which generates linguistic models for individuals whose conversation transcript is pre-loaded. The model covers all the levels of linguistic analysis detailed on the existing pro-forma, and provides summaries for an individual's average turn length, capitalisation habits, speech act preferences, variant spellings, and more. The tool allows for the scrutiny of particular words in context, and provides easy navigation around a chat transcript. While taking the human analyst out of the task is not recommended, the tool nevertheless provides an invaluable means of speeding up pre-operation preparation.

In line with Roberts (2003), what we report on here represents part of attempts, by ourselves and applied linguists in general, to intervene 'collaboratively and reflexively working with other professionals' (2003: 147). The importance of dialogue between academics and professionals cannot be overstated in discussions of how scholarly work can best inform professional practice. By engaging in a mutually beneficial and productive relationship whereby academic research is informed by the needs of the professional group under its scrutiny, we have produced findings that not only cast light on the relationship between linguistic analysis and successful authorship synthesis – the object of our academic interest – but also provided a robust underpinning to the training we provide to online UCOs.

By taking a principled linguistic approach to authorship synthesis training we can hope to ensure that different aspects of identity performance can be analysed and then emulated, thus complementing the skills of UCOs to enable them to provide more convincing and less detectable identity assumption in their investigation of a broad range of crimes, including the online sexual abuse, exploitation and grooming of children. Work deriving from this has and will include investigating the relationship between language and offender identities; cohesion and diversity in online criminal communities of practice, namely Darkweb fora organised around sharing child pornography; and the use of IM as a medium for conducting investigative interviews with child victims. In bringing language analysis to this arena we can help improve the likelihood of prosecutions against offenders and also help build credible defences for the innocent. The work thus represents a crucial contribution to furthering the stated aim of forensic linguistics to improve the delivery of justice through language analysis.

Notes

[1]The Pilgrim course is described in outline in the HMIC 2014 report *An inspection of undercover policing in England and Wales* para 11.31-11.35

Table of legislation

Sexual Offences Act 2003 - https://www.legislation.gov.uk/ukpga/2003/42

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