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# Speech of Young Offenders as a Function of Their Psychopathic Tendencies

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The purpose of this study was to analyse young psychopathic offenders' speech compared with controls and to determine whether it was dissimilar. An examination of two subsets of disfluencies in speech was conducted (i.e., filled pauses and discourse markers) to explore their disfluent language. Transcripts of Psychopathy Checklist–Revised Youth Version (PCL:YV) interviews from a sample of young offenders were analysed using Wmatrix software (Rayson, 2003, 2008). The young offenders were divided into a high psychopathy group (HP; $n = 13$) and a low psychopathy group (LP; $n = 13$). HP participants included more words relating to basic needs (i.e., money, sex) in their speech than their counterparts, but not fewer words relating to social needs (i.e., family, kin), which could reflect viewing the world in a more unemotional and instrumental way by HP individuals compared with LP participants. HP participants had fewer total disfluencies and filled pauses (i.e., *uh, um*) in their speech than LP participants. However, the usage of discourse markers (i.e., *I mean, you know, like*) was similar for HP and LP participants. Like adult psychopaths, the young offenders with higher psychopathic tendencies tended to use more basic needs words in their speech. Reduced filled pause use, which has been found to be related to individual's self-consciousness, may reflect less self-monitoring in psychopaths when they are engaging in secondary tasks (i.e., tasks that will not offer rewards). These findings provide further support that individual differences can be reflected by characteristics in speech.

***Public Significance Statement***
The results of the present study suggest that there is a relationship between young offenders' level of psychopathic tendencies and words used in their speech related to basic and social needs, and with their use of disfluent language (e.g., "uh", "um"). The findings from this article provide further evidence that individual differences can be reflected in speech and that linguistic analysis could play an increasingly important role in the future in terms of examining relations between individual difference measures and speech use.

*Keywords:* language, psychopathy, verbal analysis, young offenders

Speech is used to transmit ideas, emotions, concepts, and values from one interlocutor to the other. Analysing people's word choice during speech becomes invaluable in understanding how their individual differences, such as personality traits, are reflected through their language production. Frequencies of words can be analysed to find meaningful patterns that reflect personality processes (Hancock, Woodworth, & Porter, 2013; Laserna, Seih, & Pennebaker, 2014; Pennebaker & King, 1999; Pennebaker, Mehl, & Niederhoffer, 2003; Tausczik & Pennebaker, 2010). For instance, in comparison with introverts, extraverts have been found to use a higher number of total words as well as a lower frequency of larger words when they speak. Extraverts also include higher numbers of words associated with positive emotion and sociability in their speech (Tausczik & Pennebaker, 2010). These findings reflect the current understanding in personality psychology in that extraverts generally experience more positive affect and tend to be more loquacious than introverts (Zelenski, Santoro, & Whelan, 2012). Another example is that individuals with higher levels of the personality trait agreeableness tend to use more positive emotion in their speech than negative emotion, whereas individuals that score higher in neuroticism tend to use more negative words than positive ones (Pennebaker & King, 1999). As well, individuals' frequencies of pronoun use in speech has been shown to predict important health and relationship stability outcomes (Rude, Gortner, & Pennebaker, 2004; Sillars, Shellen, McIntosh, & Pomegranate, 1997). Furthermore, Pennebaker and King (1999)

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determined that individual linguistic styles tend to be consistent by analysing authors' corpora of texts by the different stages in their careers. In general, individuals' personality differences can be predicted with relatively good accuracy based on their linguistic styles in speech (Laserna et al., 2014; Pennebaker & King, 1999; Pennebaker et al., 2003; Tausczik & Pennebaker, 2010).

Psychopathy is characterised by emotional callousness, egocentricity, lack of guilt, and the inability to learn from punishment (Blair, Mitchell, & Blair, 2005; Casey, Rogers, Burns, & Yiend, 2013; Cleckley, 1976; Hare, 2003). There is a link between psychopathy and violence (Serin, 1991; Williamson, Hare, & Wong, 1987). For instance, psychopathy is associated with elevated levels of instrumental, or goal-mediated, aggression compared with nonpsychopaths, and the victims of psychopaths' aggressive behaviours are more likely to be unknown to their perpetrators (Cornell et al., 1996; Williamson et al., 1987). Although the prevalence rate for psychopathy in males within the community is estimated to be 0.75%, the estimated rate for psychopathy in male inmates within the United States is 15% to 25% (Blair et al., 2005; Hare, 1996). There is convincing support for a link between psychopathy and recidivism, and it has been found that psychopaths are more likely to engage in violent behaviours once they are released (Laurell & Dåderman, 2005; Serin & Amos, 1995). Biologically, psychopathy has been proposed to be the result of a dysfunction in the interconnections of the amygdala and other neural systems (e.g., medial thalamus, ventromedial frontal) which are involved in moral reasoning, socialization and emotional processing (Blair, 2005).

There is evidence that psychopaths process language in dissimilar ways compared with nonpsychopaths. For instance, psychopaths show a smaller right-ear advantage during a dichotic listening task (Hare & McPherson, 1984). The lesser right-ear advantage in psychopaths may be attributable to abnormalities in the left hemisphere of their brains which are more responsible for language processing. They also make more errors on matching words from previously seen abstract categories when they are presented in the right visual field (RVF) compared with nonpsychopaths (Hare & Jutai, 1988). Furthermore, psychopaths show a reduced ability in discerning differences between affective and neutral stimuli while completing a lexical decision task (Williamson, Harpur, & Hare, 1991). These findings suggest that psychopaths may be less able to process abstract words as well as emotional salience in language.

Hancock et al. (2013) analysed crime narratives provided by psychopathic and nonpsychopathic homicide offenders. Text analysis of these narratives provided evidence that the instrumental orientation of psychopaths, as well as their greater focus on basic needs rather than social needs and their stunted emotionality, was reflected in their linguistic style. For instance, they tended to use more subordinating conjunctions (e.g., *although, because*) and words relating to basic needs (e.g., *money, food*); Hancock and colleagues (2013) posited that psychopaths used more subordinating conjunctions to describe their crimes in a cool, logical, and detached way—which is more characteristic of instrumental violence. Their use of words relating to basic needs reflected their instrumental and manipulative world view in that they have less regard for others when attempting to achieve material rewards. Not surprisingly, psychopaths were also found to use fewer words relating to social needs such as family and spirituality; psychopaths typically show a reduced need for social connections and nonpsychopaths may feel more distressed by the harmful effects their actions have on others (e.g., the victim's family). However, there was no difference found between psychopaths and nonpsychopaths in the emotionality (i.e., pleasantness, intensity) of their language through dictionary of language (DAL) scores. However, a secondary analysis revealed a correlation between Factor 1 scores on the Psychopathy Checklist Revised (PCL-R) and the pleasantness and intensity dimensions of DAL scores. Further, Le, Woodworth, Gillman, Hutton, and Hare (2017) looked at psychopathic offenders' word use during the PCL-R assessment instead of analysing crime narratives and found increased number of personal pronouns, fewer references to other people, and decreased number of anxiety-related words in their speech relative to other offenders. Their results further suggest that psychopathic language can mirror key features of psychopathy such as egocentricity and lack of affect, especially with regard to decreased anxiety witnessed by those who score higher in psychopathic traits.

Importantly, disfluent speech (i.e., disfluencies) of psychopaths differed in comparison with nonpsychopaths (Hancock et al., 2013; Le et al., 2017). Disfluencies can be described as interruptions in speech such as interjecting the words *uh*, *I mean*, *you know*, *um*, which are thought to be used when the interlocutor is thinking about what to say next, or choosing an idea to incorporate in their speech (Schachter, Christenfeld, Ravina, & Bilous, 1991). Disfluencies should be more present in speech when there is ambiguity in what the person should say or they have to choose between a panoply of options. Hancock et al. (2013) argued that the increased cognitive demand needed for psychopaths to describe their crimes in a way that portray a sense of remorse and compunction, which they may not experience, should result in more errors or disfluencies in speech. Hence, they may be engaging in impression management. In contrast, Le et al. (2017) argued that greater disfluencies were markers of reduced coherence in speech. Past research has also found that the frequency of these disfluencies can be affected by the topic (e.g., its concreteness and familiarity; Reynolds & Paivio, 1968). Furthermore, disfluencies in speech can be sorted into different subsets; Laserna et al. (2014) distinguished two types of filler words, filled pauses (*uh*, *um*) and discourse markers (*I mean*, *you know*, *like*), and found that the frequency of discourse markers in speech was associated with people's level of the personality trait conscientiousness, but not the frequency of filled pauses. These two types of filler words can then reflect different personality processes and it would be beneficial to examine them separately in corpora.

In the current study, we wished to determine whether word usage by young offenders with higher levels of psychopathic traits was similar to the adult psychopath population. One limitation in Hancock et al.'s (2013) study, which they acknowledged in their discussion, was that their sample included homicide offenders and the results found may not generalise to offenders who commit less severe crimes. We completed an analysis of offenders' word use during a Psychopathy Checklist–Revised Youth Version (PCL: YV) interview using the Wmatrix software. Assuming continuity between adult and young offenders, it was predicted that young psychopathic offenders would use more words relating to basic needs and fewer words relating to social needs than nonpsychopaths. In past research, children and adolescents with psychopathic tendencies have been found to perform similarly to adult psychopaths in certain experimental paradigms and there seems to be

relative stability in psychopathic traits throughout development (Cruise, Colwell, Lyons, & Baker, 2003; Edens, Skeem, Cruise, & Cauffman, 2001; Frick, 2002; Johnstone & Cooke, 2004; Pardini & Frick, 2013).

We also looked at a subset of disfluencies (i.e., filler words) and whether the two categories of filler words examined by Laserna et al. (2014) would be used in different frequencies by participants based on their psychopathic tendencies.

## Method

### Participants

Transcripts used in the present study were derived from interviews of young offenders by Flight (2004) for analysis. There were originally 51 male participants in the study by Flight and colleagues, but speech was recorded for a smaller subset of 27 interviews and used for analysis in the present study. One participant's data were excluded from analysis because the total number of words was more than three standard deviations above the mean. The original 51 participants were incarcerated in one of the following Canadian institutions for committing violent offenses: Brookside Youth Centre, Bluewater Youth Centre, and the Ottawa-Carleton Detention Centre. The age of the participants in the present study ranged from 16 to 20 years ($M = 17.10$, $SD = 0.88$). The majority of these participants were Caucasian (62%), although 12% were African American, 12% were aboriginal, 2% were Hispanic, and 7% were mixed ethnicity. It was not known whether participants' first language was English.

### Materials

**Psychopathy Checklist: Youth Version (PCL:YV).** The PCL:YV is a 20-item scale used to assess psychopathic tendencies in youth (i.e., adolescents; Forth, Kosson, & Hare, 2003). It is a modified version of the original PCL-R and consists of the same semi-structured interview format but is more age-appropriate. Each of the items is scored on a 3-point scale (0, 1, 2) where a score of 0 indicates that the item does not apply, a score of 1 indicates that the item partially applies, and a score of 2 indicates that the item definitely applies. Forth et al. (2003) reported that the PCL:YV has good psychometric properties including high interrater reliability and good internal consistency with Cronbach's alphas that range from .85 to .94 depending on the setting. The PCL:YV is similar to the PCL-R in its psychometric properties (Flight, 2004; Forth et al., 2003).

**Wmatrix.** Wmatrix (http://ucrel.lancs.ac.uk/wmatrix/) is a computerized linguistic analysis tool used to compare corpora (Rayson, 2003, 2008). Wmatrix was designed to measure the frequencies of words in text. However, it extracts additional information that the other tools do not by tagging and disambiguating parts of speech (POS) and grammatical aspects, analysing language at multiple levels (e.g., semantic, syntactic, morphological), and distinguishing the temporal characteristics of verbs (e.g., past tense and present tense). Wmatrix uses both the Constituent Likelihood Automatic Word-tagging System (CLAWS) and UCREL Semantic Analysis System (USAS) to automatically assign POS and semantic tags to words in corpora with high accuracy (approximately 92% to 97%). The Wmatrix program can analyse a small number of corpora (usually two) based on the frequencies of POS and semantic tags within the texts while using Log-likelihood ratios (LLR) to compare significant pairwise differences in word frequencies between the corpora. Generally only LLRs at the 0.01% level are considered significant because of the large number of comparisons being made. LLRs differ from chi-squared test measures, often employed by other researchers to measure statistically significant differences in words, in that they do not depend on the sample size (Rayson, 2003). A list of the significant differences in semantic tag frequencies between two corpora is produced by the software as well as concordance lines of individual words which can be used to manually check for incorrect annotations (e.g., words that may have multiple meanings). Rayson (2003) encourages researchers to ensure that the frequencies of words occur in similar contexts before using the information to draw conclusions. These comparisons are based on the sorting of frequencies of words into semantic categories and statistically comparing them using LLRs.

### Procedure

The audio tapes of the interviews were first digitalized using Audacity software (Mazzoni & Dannenberg, 2002), and then nine volunteers transcribed the audio files of the interviews using Child Language Analysis software (CLAN; MacWhinney, 2000). Volunteers first completed the transcription of a reference file before the interview files so that comparisons could be made to ensure their consistency. Volunteer transcribers were blind to PCL:YV scores. Their transcriptions did not contain phonemic information and were later edited to remove any extraneous information (e.g., interviewer text, extraneous characters).

A median split was conducted based on participants' PCL:YV scores where the median PCL:YV score was 18. The participants were divided into two groups: individuals with lower psychopathy scores (LP; $n = 13$, $M = 11.40$, $SD = 1.03$), and individuals with higher psychopathy scores (HP; $n = 13$, $M = 25.31$, $SD = 1.53$). LP participants were slightly older ($M = 17.27$, $SD = .79$) than HP participants ($M = 16.87$, $SD = .92$), but this difference was not significant, $t(24) = 1.18$, $p = .25$. There was no indication that ethnicity was associated with psychopathic tendencies in our sample, $\chi^2(3) = .26$, $p = .97$. Half of the participants in this study could be considered as presenting low levels of psychopathic traits with measured PCL:YV scores ranging from 8–18, whereas the other half of the sample consisted of participants who presented with moderate (26.92%; PCL-YV range of 19–27) to high (23.08%; PCL-YV range of 28–34) psychopathic traits as measured using the PCL:YV. The High Psychopathy (HP) category in this study best represents participants with moderate-to-high PCL:YV scores while the Low Psychopathy (LP) category includes participants with PCL:YV scores that have historically been considered low in previous research (e.g., Campbell, Porter, & Santor, 2004; Murrie & Cornell, 2002). The proportions in each category are comparable with previous research looking at psychopathic traits in adolescence. Approximately 1/5 of the sample could be considered as "psychopaths" if one were to subscribe to the commonly used cutoff of 25 for research purposes (i.e., PCL-YV scores greater than or equal to 25) although this cutoff is

often controversial (e.g., Skeem, Polaschek, Patrick, & Lilienfeld, 2011).[1]

Participants' transcripts were then aggregated into two separate text files; one file contained transcripts from participants in HP group and the other contained transcripts from participants in the LP group. These two files were then analysed using the Wmatrix software. This allowed for the production of a frequency-ordered list of semantic category differences between the two corpora. According to Laserna and colleagues (2014), five filler words (i.e., *uh*, *um*, *I mean*, *you know*, *like*) have been reported to separate into two separate factors: discourse markers (*I mean*, *you know*, *like*) and filled pauses (*uh*, *um*). Wmatrix was used to analyse each filler word separately between LP and HP transcripts to determine whether the relationship between psychopathic tendencies and disfluent language differed depending on whether the words used could be best considered as filled pauses or discourse markers. These results are presented in Table 3. Statistical analyses were conducted using SPSS Version 24.

## Results

The total word count in both corpora was 97,877 words, which included 55,522 words spoken by the 13 participants in the HP group ($M = 4{,}271$, $SD = 1{,}932$) and 42,355 words spoken by the 13 participants in the LP group ($M = 3{,}254$, $SD = 1{,}174$). There was no significant difference found in the number of words used by each group, $t(25) = 1.62$, $p = .12$. Differences in word frequencies within semantic categories were analysed using Wmatrix. Refer to Table 1 for these results. A similar statistical approach was taken to Hancock et al. (2013) in that one degree of freedom LLR values that were calculated from contingency tables were reported, and a conservative cut-off, $p < .01$, was used to control for the multiple comparisons that were made.

### Analysis of Basic and Social Needs in Language

As suggested by Hancock and colleagues (2013), psychopaths' materialistic view of the world may be reflected by their word choice. In the current study, participants in the HP group tended to use more words in relation to physiological and material needs compared to the LP group (see Table 1). For instance, they used words related to money, food, vehicles and other modes of transportation, household items, and anatomy and physiology more than people in the LP group. The frequency of words in semantic categories relating to social needs (i.e., belonging to a group, personal names) was similar for both groups, except that the HP group used significantly fewer kin words (e.g., mother, sister) than the LP group.

### Analysis of Disfluent Language

Wmatrix was used to compare corpora based on the frequencies of words related to disfluencies (e.g., *uh, I guess, hmm, like*). Some examples of disfluent word use in context are presented in Table 2. Participants in the HP group used a significantly lower frequency of total disfluencies than participants in the LP group (LLR = 120.73; see Table 3).

Five filler words (i.e., *uh*, *um*, *I mean*, *you know*, *like*) have been examined in previous research and can be thought of as representing potential markers for personality and social phenomena (Laserna et al., 2014). Furthermore, these filler words have been reported to separate into two separate factors: discourse markers (*I mean*, *you know*, *like*) and filled pauses (*uh*, *um*). Of interest here is whether these two types of filler words relate in dissimilar ways to participants' psychopathy levels. Wmatrix was used to determine this by analysing each filler word separately between LP and HP transcripts. These results are presented in Table 3. Interestingly, both filled pauses (*uh*, *um*) were less frequent in HP transcripts than LP transcripts (LLRs $< -94.14$). Indeed, when the percentage frequency of all filled pauses was compared for HP and LP participants using an independent samples $t$ test that was corrected for unequal variances across groups, the percentage of filled pauses in HP participants' speech was significantly less than the percentage of filled pauses in LP participants' speech, $t(16.75) = 2.79$, $p = .03$, $d = 1.36$.[2]

In contrast, the only discourse marker LLR that reached significance was in the opposite direction where the word like was more frequent in HP transcripts than LP transcripts (LLR = 125.96). It is intriguing to note that the frequency of the filler word *like* in the HP transcripts is equal to more than 50% of the disfluencies in the LP transcripts. When the percentage frequency of all discourse markers was compared for HP and LP participants' speech using an independent samples $t$ test that was corrected for unequal variances across groups, no significant difference was observed in the use of discourse markers for LP and HP participants, $t(23.87) = .64$, $p = .53$, $d = .26$ (see Figure 1).

Because the majority of evidence suggests that psychopathy scores can be considered on a continuum, participants' psychopathy scores were correlated with their use of filled pauses and discourse markers. These Pearson correlation results are presented in Table 4.[3] The two filled pauses combined were negatively correlated with PCL:YV scores, although when examined individually only the word *uh* was found to be significant. Also similar to previous analyses, discourse marker words were either found to have no relation to PCL:YV scores (i.e., *you know*, *I mean*), or to have a significant positive correlation (i.e., *like*). The total discourse markers were not found to significantly correlate with PCL:YV scores.

In summary, we replicated the finding that the usage of disfluencies in participants' speech differs based on their levels of psychopathic traits. This is the first time that this relationship has been found using a younger adolescent sample and could suggest that linguistic markers of psychopathy may remain stable across development. Also, our results suggest that subdividing disfluencies into filled pauses and discourse markers, as outlined by Laserna and colleagues (2014), may be warranted in future research as filled pauses were found in this study to negatively relate to psychopathy levels whereas psychopathy levels did not relate to discourse markers.

[1] Further analysis revealed that these results remained significant when comparing participants with PCL-YV scores above the commonly used cutoff of 25 with the rest of the sample.

[2] Similar results were also found using Mann–Whitney $U$ nonparametric tests when analyzing both filled pauses and discourse markers.

[3] Similar results were also found using Spearman Rho nonparametric tests when analyzing both filled pauses and discourse markers.

Table 1
*Frequencies of Words During PCL:YV Interviews as a Function of Semantic Categories*

| Category | High group (HP) | | Low group (LP) | | Log-likelihood ratio (LLR) |
|---|---|---|---|---|---|
| | Frequency | % | Frequency | % | |
| Physiological and material needs | | | | | |
| Vehicles and transport | 224 | 0.43 | 114 | 0.21 | 39.31** |
| Money | 231 | 0.44 | 106 | 0.20 | 50.73** |
| Furniture and household fittings | 45 | 0.09 | 17 | 0.03 | 13.84** |
| Location and direction | 789 | 1.50 | 651 | 1.21 | 16.99** |
| Food | 84 | 0.16 | 50 | 0.09 | 9.61** |
| Anatomy and physiology | 352 | 0.67 | 205 | 0.38 | 43.09** |
| Social needs | | | | | |
| Kin | 475 | 0.90 | 587 | 1.09 | −16.99** |
| Belonging to a group | 78 | 0.15 | 54 | 0.10 | 5.02 |
| Personal names | 65 | 0.12 | 82 | 0.15 | 1.56 |

** $p < .01$.

## Discussion

Similar to adult psychopaths in previous research, young offenders with higher psychopathic tendencies included more words related to basic needs in their speech. As suggested by Hancock and colleagues (2013), their use of more basic needs words may reflect their propensity to view the world in a more primitive, unemotional, and instrumental way compared with LP participants (Hancock et al., 2013). Psychopaths are more inclined to use words in relation to both unconditioned (e.g., sex, food) and conditioned (e.g., money) rewards. Psychopathy has been previously associated with greater levels of instrumental aggression whereby individuals will become aggressive to gain a reward (e.g., money; Williamson et al., 1987). There may then be a relationship between how psychopaths commit aggressive acts and their increased propensity in obtaining rewards. Thus, their focus on material and physiological rewards may then be reflected in their increased use of instrumental aggression toward others compared to nonpsychopaths.

Psychopaths' ability to dupe those around them and cause harm to their victims is aided by their emotional callousness and relative indifference to the suffering of others (Cleckley, 1976). The dominant theories of psychopathy consider it to be the result of at least some form of emotional dysfunction (Blair et al., 2005; Blair, Colledge, Murray, & Mitchell, 2001; Blair & Mitchell, 2009; Blair, 1997, 1999, 2005, 2007; Brook, Brieman, & Kosson, 2013; Hastings, Tangney, & Stuewig, 2008; Verona, Patrick, Curtin, Bradley, & Lang, 2004). Contrary to our hypothesis, participants with higher levels of psychopathy scores in this study did not use fewer words related to social needs compared with lower psychopathic participants; the HP group did use fewer words related to kin (e.g., mom, dad, brother), but not words related to belonging to a group (e.g., gangs, club, together), or personal names. However, participants in previous research had committed more severe crimes (e.g., homicide) compared with the participants in the current study, and this could explain the somewhat different finding. Friends and other social acquaintances may be less likely to continue communicating with those that are within forensic settings if they have committed more severe crimes. This would be reflected in homicidal participants' speech in that they would have less interaction with others and therefore refer less to their bonds with them (e.g., "I saw my girlfriend yesterday when she came to visit"). It could also be attributable to the different narrative formats used during the interviews (i.e., PCL:YV compared to a lesser structured interview).

Higher rates of antisocial behaviours shown by their adolescent peers may also explain why young offenders use more social words in their speech. Changes in the brain during adolescence increase the likelihood of risk-taking and sensation seeking (Moffitt, 1993). Teens may behave in ways that seem impulsive and out of character to achieve peer acceptance and status, and therefore may be more accepting toward others who display psychopathic tendencies and antisocial behaviours. As they get older and reduce the frequency of their antisocial behaviours, they may be less likely to associate with people that continue these harmful behaviours (i.e., life course-persistent offenders such as psychopaths; Blair et al., 2005).

Participants in the HP group were found to use fewer disfluencies overall compared with the LP group. They used significantly fewer *uh* and *um* words but used *like* more often throughout their interviews.

Evidence from the present study supported Laserna et al.'s (2014) finding that two separate factors (i.e., discourse markers

Table 2
*Examples of Disfluent Language Used During PCL:YV Interviews by Young Offenders*

| Language category | Language examples |
|---|---|
| Disfluencies | *Um*. Well the reason I'm in here is because I was staying at my girlfriend's house.<br>I was interested until a few years ago when I don't know meet girls a lot even for the most part *you know* sometimes I don't even care . . . |

Table 3
*Types of Disfluencies as Well as the Two Categories of Filler Words (Discourse Markers, Filled Pauses) as a Function of Psychopathy Level*

| | High group | | Low group | | |
|---|---|---|---|---|---|
| Type of disfluency | Frequency | % | Frequency | % | Log-likelihood ratio (LLR) |
| Disfluencies | 3448 | 6.55 | 4529 | 8.38 | −120.73*** |
| Filled pauses | | | | | |
| Uh | 296 | 0.56 | 746 | 1.38 | −189.60*** |
| Um | 167 | 0.32 | 402 | 0.74 | −94.14** |
| Discourse markers | | | | | |
| IM | 20 | 0.04 | 21 | 0.04 | −2.31 |
| YK | 247 | 0.47 | 267 | 0.49 | −5.11 |
| Like | 1752 | 3.33 | 1183 | 2.19 | 125.96*** |

*Note*. YK = You know; IM = I mean.
** $p < .01$. *** $p < .001$.

and filled pauses) could be extracted from the filler words. For instance, HP participants used fewer filled pauses compared with LP participants, but not more discourse markers. Filled pauses were also moderately negatively correlated with PCL:YV scores whereas there was a nonsignificant relation between discourse markers overall and PCL:YV scores, although use of the discourse marker *like* was more likely with HP participants. Participants differed in how they used filled pauses during their interviews versus how they used discourse markers.

Some researchers have proposed a relationship between psychopathy and affective deficits such as low fear/anxiety (Blair, 2005; Blair et al., 2001; Cooke & Michie, 2001; Douglas, Nikolova, Kelley, & Edens, 2015). The increased use of filled pauses in LP participants' speech during the interaction between the two interlocutors may be attributable to the greater feelings of uncertainty in LP participants (Lalljee & Cook, 1973), or perhaps other affective/interpersonal differences between LP and HP participants (Derefinko, 2015). Intuitively, people's anxiety levels may be highest when they are initiating a conversation with another person. However, Lalljee and Cook (1973) posited that people received feedback from those they were talking to and simultaneously monitored their own speech based on the feedback they received. Therefore, the more they talked as the interview progressed, the more feedback they received. Furthermore, Christenfeld and Creager (1996) proposed that it is not the greater anxiety levels that result in higher filled pause frequencies, per se,

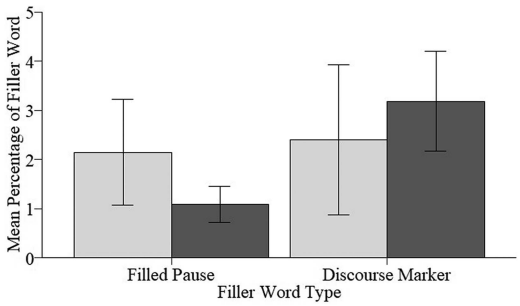


*Figure 1.* Percentage of HP (darker gray) and LP (lighter gray) participants' grouped filler words usage. Error bars represent 95% confidence intervals.

but the self-consciousness associated with greater anxiety and uncertainty that elicits higher filled pause frequencies. This would coincide with the finding that psychopaths use fewer anxiety-related words in their speech (Le et al., 2017). In this sense, higher frequencies of filled pauses may reflect more effort and attention allocated to monitoring speech.

Lower frequencies of filled pauses in HP participants compared with LP participants may indicate that the HP participants are monitoring their speech less. HP participants may be less concerned with ensuring that what they say to their interviewers is appropriate or present themselves in a better manner compared with LP participants. They may be less willing or able to notice feedback being given and thereby focus less on the words they choose to use. There is some evidence that individuals with greater psychopathic tendencies show reduced social performance in supposedly fearful situations (Louise von Borries et al., 2012; Thomson et al., 2019). Also, it is important to highlight the context in which the interviews took place: the participants were aware that they were being interviewed for research purposes, and that the information they gave would not be used to either reward or punish them later on. Therefore, there was no incentive for participants to present themselves in a positive way. For instance, if the answers given by the interviewees were then later given to a committee and used to decide their remaining sentencing length (i.e., how long they should remain within the institution), then there would have been a higher incentive to monitor speech. Psychopaths have been found in past research to regulate and monitor themselves less when they are engaging in secondary tasks (i.e., tasks that are not goal-orientated; Cooke, Forth, & Hare, 1997). HP participants may have been less motivated to monitor their speech throughout an extended interaction with the interviewer given that they are not being rewarded for doing so. In contrast, less psychopathic individuals may be more prone to be adversely affected by negative feedback from the interviewer following the divulgence of their antisocial behaviours and may use more effort than HP participants in avoiding this feedback by increased self-monitoring. Increased activation in the behavioural inhibition system in LP participants compared with HP participants during negative feedback, or perceived negative evaluation from the interviewer, may have occurred (Arnett, 1997; Gray, 1970).

Table 4
*Bivariate Pearson's Correlations Between Filler Words (uh, um, I mean, You Know, Like), Groups of Filler Words (Filled Pauses and Discourse Markers), and PCL:YV Scores*

| Measure | 1. Uh | 2. Um | 3. I mean | 4. You know | 5. Like | 6. Filled pauses | 7. Discourse markers |
|---|---|---|---|---|---|---|---|
| PCL:YV Scores | −.47* | −.34 | −.01 | −.04 | .34 | −.51** | .20 |

* $p < .05$. ** $p < .01$.

Some limitations should be considered when discussing the implications of the current study. The most obvious is the small sample size included in this study. Although this is certainly a weakness, the statistical tests that were included are generally less affected by sample size than parametric tests (for discussion see Rayson, 2003). Comparing those with higher psychopathic tendencies with those with lower psychopathic tendencies, and interpreting differences in speech attributable to underlying characteristics of psychopathy, is quite common in literature examining the relationship between psychopathy and speech (Hancock et al., 2013; Le et al., 2017). It is currently unclear whether underlying characteristics of psychopathy (e.g., callousness, reduced anxiety) can largely explain the relationships found here. It is possible that the broad construct of psychopathy is a better predictor of speech differences seen here than any of the underlying characteristics on their own, although this may be an avenue for future research. Another limitation of this study is that phonemic information in participants' speech was not analysed. Extraneous factors such as the speed in which participants talked may have played a crucial role in the number of filled pauses presented in their speech. It is possible that phonemic properties moderate the association between PCL:YV scores and filled pauses. Finally, it is possible that participants' proficiency in speaking English could influence their use of disfluent language. Individuals who are learning English as a second language might display greater frequencies of filler words in their speech. It could be useful to examine whether learning English as a second language can moderate the association between psychopathic tendencies and disfluent language in future research.

In summary, the results from this study suggest that, like adult psychopaths, young offenders with higher psychopathic tendencies included a greater number of words relating to basic needs. They also used speech that contained a different frequency of disfluencies relative to young offenders with lower psychopathic tendencies, such that the use of filled pauses (*uh*, *um*) negatively predicted psychopathy scores whereas the use of discourse markers (*like*, *I mean*, *you know*) did not. Ultimately, these results suggest that the linguistic differences between psychopathic and nonpsychopathic adults can be seen when examining a sample of young offenders, suggesting the relation between psychopathy and word use in speech could persist across the life span. Finally, these findings provide further support that individual differences in psychopathic tendencies can be reflected by characteristics in speech.

## Résumé

Le but de cette étude était de comparer le discours de jeunes contrevenants psychopathes à celui de témoins et de déterminer s'il y avait des différences. Un examen de deux sous-ensembles de disfluences au niveau du discours a été effectué (p. ex., des pauses remplies et des marqueurs) afin d'explorer leur disfluence verbale. Des entrevues réalisées au moyen de l'outil *Transcripts of Psychopathy Checklist–Revised Youth Version (PLC:YV)* auprès de jeunes contrevenants ont été analysées à l'aide du logiciel Wmatrix (Rayson, 2003, 2008). Les jeunes contrevenants ont été répartis en un groupe de jeunes présentant une psychopathie élevée (HP : $n$ = 13) et un groupe de jeunes présentant une psychopathie légère (LP : $n$ = 13). Les participants présentant une HP ont inclus davantage de mots relatifs aux besoins fondamentaux (p. ex., l'argent, le sexe) dans leurs discours que leurs homologues, mais pas moins de mots relatifs aux besoins sociaux (p. ex., la famille, les proches). Cela donne à penser que les individus présentant une HP voient le monde d'une manière plus flegmatique et instrumentale que les individus présentant une LP. Les participants présentant une HP ont affiché moins de disfluences totales et de pauses remplies (c.-à-d., *euh*, *heu*) dans leurs discours que les participants présentant une LP. Or, l'utilisation de marqueurs de discours (p. ex., *je veux dire, vous savez, comme*) était similaire entre les deux groupes de participants. Comme les psychopathes adultes, les jeunes contrevenants présentant des tendances psychopathes plus élevées semblaient utiliser davantage de mots relatifs aux besoins fondamentaux dans leurs discours. L'utilisation réduite de pauses remplies, qui serait associée à la timidité de l'individu, pourrait se traduire par un autocontrôle réduit chez les psychopathes lorsque ces derniers effectuent des tâches secondaires (p. ex., des tâches qui n'offrent pas de récompenses). Ces résultats corroborent l'hypothèse voulant que les différences individuelles peuvent se traduire par des caractéristiques au niveau du discours.

*Mots-clés* : langage, psychopathie, analyse verbale, jeunes contrevenants.

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