



The Impacts of Face-to-Face and Cyber Incivility on Performance, Helping Behavior, Counterproductive Behaviors, and Physiological Activity

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Abstract

The present experiment compared the immediate impacts of cyber incivility and face-to-face incivility vs. neutral interactions on both behavioral [task performance, creativity, flexibility, helping behavior, and counterproductive behaviors (CBs)] and physiological outcomes [heart rate (HR), heart rate variability (HRV), and skin conductance (SCR)]. We randomly assigned 232 undergraduate students to one of four conditions: (1) face-to-face uncivil, (2) cyber uncivil, (3) face-to-face neutral, or (4) cyber neutral. In the uncivil conditions, two uncivil interactions were delivered with instructions to complete anagrams and list uses for a brick. Physiological responses were measured while participants completed the tasks. Additionally, participants were given the opportunity to help the experimenter by picking up pens that were “accidentally” dropped. Thefts of extra candy, pens, and gift cards served as measures of CBs. After uncivil interactions, participants engaged in significantly more CBs and experienced greater HR increases as compared to neutral interactions. Additionally, participants were most likely to steal pens in the face-to-face uncivil condition. However, HR increased more in cyber conditions than face-to-face conditions. Instances of incivility did not impact task performance, creativity, flexibility, or helping behavior. These findings suggest that although face-to-face incivility led to increased CBs, cyber incivility may have a stronger impact on physiological responses.

Keywords Incivility · Cyber incivility · Face-to-face incivility · Counterproductive behaviors · Heart rate · Skin conductance

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Workplace incivility, defined as “low-intensity deviant workplace behavior with ambiguous intent to harm” (Andersson and Pearson 1999, p. 456), results in the targeted employee experiencing increased negative affect and workplace deviance, and decreased job performance, job attitudes, and citizenship behaviors (Schilpzand et al. 2016). Workplace incivility occurs both face-to-face and in the cyber environment. Cyber incivility, defined as “rude/discourteous behaviors occurring through information and communication technologies (ICTs) such as email” (Giumetti et al. 2012, p. 148), differs from other forms of aggression such as cyberharrassment and cyberbullying. Cyberharrassment is of strong intensity and intentional; cyberbullying is intentional, repetitive, and targets a vulnerable individual; whereas cyber incivility is ambiguous regarding intentionality, need not be repetitive, and is of lower intensity (Hershcovis 2011; Whitty and Carr 2006)¹.

Cyber incivility may have unique impacts on a target due to 24/7 access to electronic communication, a lack of social cues, the likelihood of misinterpreting emotions in these text-based messages, delayed or absent feedback, the ability to repetitively experience one uncivil encounter (e.g., reread an uncivil e-mail), and the unique features of ICTs (e.g., carbon copying; Byron 2008; Dooley et al. 2009; Kruger et al. 2005; McCarthy 2016). Despite these unique features, an important debate in the literature is whether face-to-face and cyber interactions are unique constructs with different outcomes (Hershcovis 2011; Lim and Teo 2009). However, very limited research has empirically examined the relative impacts of face-to-face and cyber incivility, with qualitative research suggesting that cyber incivility may have more severe consequences than face-to-face incivility (McCarthy 2016). Conversely, quantitative evidence suggests that face-to-face incivility has stronger links with several outcomes (burnout, turnover intentions, and job satisfaction) than cyber incivility (Heischman et al. 2019).

The present study fills many gaps in the incivility literature. First, we experimentally compare the immediate impacts of cyber incivility and face-to-face incivility on both behavioral and physiological outcomes (Cortina et al. 2017). This direct comparison of cyber incivility and face-to-face incivility sheds light on the debate about whether these are distinct constructs. Second, we experimentally investigate the short-term effects of workplace incivility, providing evidence for causality, in contrast to survey-based workplace incivility research which involves self-reports of more long-term experiences with incivility (Schilpzand et al. 2016).

Incivility and Performance

Survey-based studies have shown that experiencing face-to-face incivility is associated with decreased work performance in many industries (Chen et al. 2013; Cho et al. 2016; Han et al. 2019; Jiang et al. 2018; Sliter et al. 2010). Experimentally, Porath and Erez (2007) found that experiencing a rude interaction before completing a series of tasks reduced performance, creativity, and flexibility. Similarly, cyber incivility has been associated with decreased work performance, although existing research is more limited than research on face-to-face incivility. Across a wide range of employees, a cross-sectional survey study found that experiencing cyber incivility was associated

¹ We point readers to Scisco (2019) for a review of workplace cyberbullying, and Robinson, Wang, and Kiewitz (2014) for a review of how various deviant behaviors, including incivility and bullying, impact employees.

with decreased self-reported job performance (Giumetti et al. 2016). Experimentally, Giumetti et al. (2013) found that task performance decreased when participants received uncivil emails as compared to supportive emails. However, a limitation of Giumetti et al. (2013) was the lack of a neutral email condition.

In the present experiment, we sought to replicate the findings of Porath and Erez (2007) and demonstrate that an uncivil face-to-face interaction would decrease task performance, creativity, and flexibility. According to Affective Events Theory, experiencing incivility leads to using extensive cognitive resources to appraise the negative interaction, and this shift in cognitive resources disrupts work performance (Weiss and Cropanzano 1996). We further aimed to extend findings to cyber incivility and to be the first study to experimentally compare the impact of both face-to-face and cyber incivility on task performance, creativity, and flexibility. As noted above, several unique features of cyber incivility (such as the ability to reread the message and the lack of nonverbal cues) may lead to different outcomes than face-to-face incivility, where targets have the benefit of nonverbal information (e.g., tone of voice, body language). Given the lack of existing research comparing cyber and face-to-face incivility, we posed a research question to explore possible performance differences. Additionally, we compared incivility to a neutral interaction, rather than a supportive interaction (Giumetti et al. 2013), which allowed our study to focus solely on the potential negative impact of incivility. Therefore, we developed the following hypothesis and research question:

- *H1: Uncivil interactions will reduce task performance, creativity, and flexibility as compared to neutral interactions, regardless of medium (face-to-face or cyber).*
- *RQ1: Does the degree to which uncivil interactions impact task performance, creativity, and flexibility depend on the medium?*

Incivility and Helping Behavior

Similar to the negative relationship with task performance, evidence suggests that incivility also has a negative relationship with helping behaviors. Experiencing incivility may result in withdrawing from the social interaction and reducing helping behaviors (Andersson and Pearson 1999; Porath and Erez 2007). Survey-based studies have shown that employees who experience face-to-face incivility are less likely to exhibit helping behaviors across a variety of occupations (De Clercq et al. 2019; Mackey et al. 2017; Mao et al. 2017; Taylor et al. 2012). Experimentally, Porath and Erez (2007) demonstrated that helpfulness decreased with even one experience of face-to-face rudeness. However, no research to date has examined if cyber incivility results in decreased helping behavior. Existing research on the related construct of cyberbullying suggests that such behavior is associated with reduced helping/prosocial behaviors (Kowalski et al. 2014). Additionally, no existing research has compared the impact of face-to-face and cyber incivility on helping behavior. Thus, we posed the following hypothesis as well as a research question to explore possible helping behavior differences across the two media of incivility.

- *H2: Uncivil interactions will reduce helping behavior as compared to neutral interactions, regardless of medium (face-to-face or cyber).*

RQ2: Does the degree to which uncivil interactions reduce helping behavior depend on the medium?

Incivility and Counterproductive Behavior

In contrast to helping behaviors, counterproductive behaviors (CBs) are intentional, deviant behaviors that negatively impact the organization or its members, such as theft, verbal abuse, or decreased work effort (Penny and Spector 2005). Targets of incivility may engage in CBs as retaliatory acts (Andersson and Pearson 1999). Indeed, CBs have been positively associated with face-to-face incivility (Itzkovich and Heilbrunn 2016; Penny and Spector 2005; Porath and Pearson 2012; Welbourne and Sariol 2017) and cyber incivility (Kowalski et al. 2018; Lim and Teo 2009). In a longitudinal study, Meier and Spector (2013) found that engaging in CBs predicted experiencing later face-to-face incivility, but experiencing face-to-face incivility did not predict later CBs. Despite this null finding, the stressor-emotion model of CBs (Spector and Fox 2005) and theories of revenge for injustices (Greenberg 1993) predict that incivility would lead to CBs. Additionally, a two-wave study by Welbourne and Sariol (2017) found that incivility predicted CBs six weeks later. Only one study has directly compared the relative impact of face-to-face and cyber incivility on CBs (Kowalski et al. 2018). These authors found that the correlation between face-to-face incivility and CBs ($r = .43$) was slightly higher than between cyber incivility and CBs ($r = .38$). Building on past research, we developed the following hypothesis and research question:

H3: Uncivil interactions will increase CBs as compared to neutral interactions, regardless of medium (face-to-face or cyber).

RQ3: Does the degree to which incivility increases CBs depend on the medium?

Incivility and Physiological Activity

Although past research has linked self-reported incivility and poor physical health (e.g., Lim et al. 2008), research examining the physiological mechanisms by which incivility could lead to poorer health outcomes is almost nonexistent (see Schilpzand et al. 2016). Hypothetically, if an uncivil interaction is perceived as a threat, the sympathetic nervous system would activate, and the parasympathetic nervous system would withdraw, thereby increasing heart rate (HR) and sweating, and decreasing heart rate variability (HRV) (de Looft et al. 2018). In an experimental study, face-to-face incivility, which may have been viewed as discrimination, increased HR in White participants (Salomon and Jagusztyn 2008). However, Giumetti et al. (2013) found no differences in HR or HRV between cyber incivility and cyber support conditions, although this may have occurred because an overly stressful math task masked possible incivility effects. Importantly, the present study used less stressful tasks (i.e., solving anagrams and listing uses of a brick) to allow for further examination of the impact of face-to-face and cyber incivility on HR and HRV. Furthermore, this study was the first to examine the impact of face-to-face and cyber incivility on skin conductance response (SCR). Given the lack of past research on physiological outcomes of incivility and possible

differences in perceptions of cyber and face-to-face incivility that could result in different physiological responses, we developed the following research questions:

RQ4: Do uncivil interactions have different effects on HR, HRV, and SCR than neutral interactions, regardless of medium (face-to-face or cyber)?

RQ5: Does the impact of incivility on HR, HRV, and SCR depend on the medium?

Method

Participants

Participants ($N = 232$) were undergraduate students from two northeastern US universities ($N_1 = 114$, $N_2 = 118$). Participants were an average of 20.27 years old ($SD = 3.22$), 73.3% female, 74.6% Caucasian, 15.9% Hispanic/Latino, 12.1% African-American, 4.3% Asian, and 54.7% were employed and working an average of 11.94 h per week ($SD = 6.99$). Participants' compensation was a \$20 Amazon gift card.

Procedure and Incivility Manipulation

The study was approved by the Eastern Connecticut State University and Quinnipiac University Institutional Review Boards. Participants were randomly assigned to one of four conditions: (1) face-to-face uncivil, (2) cyber uncivil, (3) face-to-face neutral, or (4) cyber neutral. After providing informed consent, SCR and HR electrodes were applied. Then, participants watched *March of the Penguins* for 5 min as a physiological baseline. Next, the experimenter gave the participants 10 practice anagrams to complete. Participants' efforts were incentivized with a \$30 gift card for the top three performers. After 5 min, the experimenter collected the practice anagrams, and gave the participants a sheet with 10 new anagrams (the "real test"). Participants received either uncivil or neutral task feedback and instructions either face-to-face or via email from the experimenter (depending on the condition). The uncivil statements were selected from the list of uncivil statements developed by Giumetti et al. (2013) and were modified to fit the experimental context. The instructions were as follows, with uncivil components bolded. In the neutral conditions, the bolded components were removed.

Here are the correct answers. **Wow, I'm so surprised that participants like you can't get all of the practice problems right. I really wish you would pay attention to me when I give you the instructions.** Next, you will have ten minutes to unscramble this set of letters into words. Good luck, **genius**. I'll be back in ten minutes.

After 10 min, the experimenter collected the "real test" anagrams, and gave the participant the brick task. The experimenter delivered the following instructions, with uncivil components bolded. In the neutral conditions, the bolded components were removed.

Here are the correct answers. **I feel bad for your friends who have to deal with your slowness all of the time.** Anyway, for this next task, you will have five

minutes to write down as many uses as you can think of for a brick. Think of as many uses for a brick as you can and write them down. I will be back in 5 minutes.

After 5 min, the experimenter collected the brick task and removed the electrodes. Participants were asked to complete a personality measure and told to help themselves to snacks on the table, which included a bowl of M&M bags with a sign reading, “Please take only one bag of candy.” Participants were reminded to take their Amazon gift card payment from a stack of 10 cards on the table. Before leaving the room, the experimenter knocked over a cup containing 10 pens and counted how many the participant picked up.

Manipulation Check One day after the lab session, participants completed an online survey including six incivility items from the Workplace Incivility Scale (WIS; Cortina et al. 2001) and five supervisor support items from the Perceived Supervisor Support Scale (PSSS; Kottke and Sharafinski 1988) after which they were debriefed. The purpose of these items was to examine the perceived incivility of the conditions. A sample item from the WIS is “The experimenter made demeaning or derogatory remarks about me”, and a sample item from the PSSS is “The experimenter would have been willing to help me if I needed help.” The response scale ranged from 1 (*strongly disagree*) to 5 (*strongly agree*), and items from the PSSS were reverse scored. Internal reliability was high ($\alpha = 0.89$).

Measures and Materials

Task performance was measured as the number of anagrams solved correctly out of 10 (adapted from Erez and Isen 2002); e.g., rearranging the letters in “loroc” to make the word “color”. Additionally, task performance was measured as the number of brick uses produced, such as “build a house” and “break a window” (Porath and Erez 2007).

Creativity and flexibility for brick uses were rated as described in Porath and Erez (2007) on a scale from 1 (*low creativity / zero variety*) to 7 (*high creativity / many distinct categories*). Interrater reliability among three raters was good, ICCs = 0.79–0.88.

Helping behavior was measured as the number of pens picked up by the participant (Porath and Erez 2007).

Counterproductive behaviors (CBs) were measured as the number of extra candy bags taken and whether a pen or gift card was stolen.

Physiological measures of HR, HRV, and SCR were collected with the BIOPAC MP-150 (BIOPAC Systems Inc., Goleta, CA) with modules for electrocardiogram (ECG) and electrodermal activity.

Physiological Data Processing

HR, HRV, and SCR data were processed using BIOPAC’s AcqKnowledge® software. Beats per minute (BPM) and inter-beat-intervals were transformed from the raw ECG waveform. Data were visually inspected for movement artifacts that were removed by connecting the closest endpoints. The mean of SCR and BPM and the SD of inter-beat-

intervals (HRV) were obtained for the first 5 min of the baseline, “real test” anagrams, and brick task. The uncivil manipulation occurred before the start of the “real test” anagrams and brick task segments. Difference from baseline was calculated by subtracting the baseline measurements from the real test anagram and brick task measurements within participants. The resulting difference scores were screened for outliers by calculating Mahlinobis Distance (MD), and 24 data points with high MD scores ($\chi^2 > 10.82$, $p < .001$) were removed from the physiological analyses only.

Results

Manipulation Check

A 2 (tone: uncivil vs. neutral) \times 2 (medium: face-to-face vs. cyber) ANOVA indicated that participants perceived the uncivil conditions to be significantly more uncivil than the neutral conditions (see Table 1). Additionally, the face-to-face uncivil condition was perceived as the most uncivil.

Hypothesis Testing

Task Performance, Creativity, and Flexibility (H1 and RQ1) 2 \times 2 ANOVAs indicated no significant effects of incivility or medium on task performance, creativity, or flexibility, nor a significant interaction (all p 's $> .70$). H1 was not supported.

Helping Behavior (H2 and RQ2) A 2 \times 2 ANOVA revealed no significant main effects of incivility or medium on number of pens picked up, nor a significant interaction (all p 's $> .40$). H2 was not supported.

Table 1 ANOVA Results and Descriptive Statistics for Manipulation Check (Perceived Incivility) by Tone and Medium

Variable	Mean		SD		N
Cyber					
Uncivil	27.05		7.08		56
Neutral	22.79		5.81		56
Face-to-face					
Uncivil	32.56		9.85		50
Neutral	22.35		6.30		54
Source	SS	df	MS	F	partial η^2
Medium	346.625	1	346.63	6.41*	0.03
Tone	2822.94	1	2822.94	52.16*	0.20
Interaction	475.357	1	475.36	8.78*	0.04
Error	11,472.903	212	54.12		

$R^2 = .23$, adjusted $R^2 = .22$. Medium = cyber vs. face-to-face. Tone = uncivil vs. neutral

* $p < .05$

CBs (H3 and RQ3) We performed a Poisson regression on the number of extra candy bags taken (as the data was highly skewed) with medium and tone as predictors. More candy bags were taken in the uncivil conditions ($M = 0.13$, $SD = 0.70$) than the neutral conditions ($M = 0.03$, $SD = 0.22$), Wald $\chi^2(1) = 4.85$, $p = .03$, but there was no main effect for medium, nor a significant interaction. Chi-square tests of independence were conducted to examine differences in pen theft and gift card theft between the four conditions. Results indicated a significant chi-square for pen theft, $\chi^2(1, df = 3) = 7.89$, $p = .048$, $\phi = 0.18$. Examination of the standardized residuals (SDR) for each condition (Field 2009) indicated that there were significantly more pen thefts in the face-to-face incivility condition (10 thefts, $SDR = 2.20$, $p < .05$) than the other three conditions (from 2 to 5 thefts, all $SDRs < 1.30$). There were no significant differences between conditions in likelihood of stealing a gift card ($p = .27$), but it is worth noting that the only three gift card thefts were from participants in uncivil conditions. H3 was partially supported.

Physiological Activity (RQ4 and RQ5)

2×2 ANOVAs revealed no significant main effects of medium nor tone on SCR, nor a significant interaction (all p 's $> .26$).

The increase in HR from baseline to anagram task was greater for participants in the uncivil conditions ($M = 3.61$, $SD = 5.38$) as compared to the neutral conditions ($M = 1.81$, $SD = 4.58$), $F(1, 196) = 6.37$, $p = .01$, partial $\eta^2 = .03$, but there was no significant main effect for medium, nor a significant interaction. Additionally, the increase in HR from baseline to brick task was greater for participants in the cyber conditions ($M = 3.27$, $SD = 7.44$) as compared to the face-to-face conditions ($M = 1.09$, $SD = 4.89$), $F(1, 196) = 6.02$, $p = .01$, partial $\eta^2 = .03$, but there was no significant main effect for tone, nor a significant interaction.

Finally, there were no significant main effects of medium nor tone on HRV, nor significant interactions (all p 's $> .30$).

Discussion

This study experimentally compared the immediate impacts of cyber incivility and face-to-face incivility on behavioral and physiological outcomes. On the one hand, our results failed to replicate previous findings (e.g., Porath and Erez 2007) - we found no significant differences in task performance, creativity, flexibility, or helping behavior between uncivil and neutral conditions. Our study may not have replicated Porath and Erez's (2007) study because the uncivil interaction in the current study consisted of different phrases and occurred twice as opposed to once. On the other hand, our results extend existing literature by demonstrating that incivility may lead to CBs. Specifically, participants who experienced incivility were more likely to steal a pen and take more candy than instructed. Interestingly, participants were most likely to steal pens in the face-to-face uncivil condition. Additionally, there were three participants who stole a gift card, and while not statistically significant, all three participants were in uncivil conditions. Together, these results support previous research linking incivility to CBs

(e.g., Welbourne and Sariol 2017), and extend the literature by showing that cyber incivility also leads to CBs.

Importantly, we found that incivility led to a greater increase in HR than neutral conditions during the first uncivil interaction. Additionally, HR increased more in cyber than face-to-face conditions during the second uncivil interaction. These results extend the incivility literature by pointing to a possible physiological mechanism through which incivility may lead to negative health outcomes such as burnout or physical symptoms (Giumetti et al. 2012; Lim et al. 2008). Additionally, the findings suggest that although face-to-face incivility led to increased CBs, cyber incivility may have a stronger impact on physiological responses. These results contribute to the literature by suggesting that face-to-face and cyber incivility may be constructs with different outcomes.

Limitations of this study include weak external validity due to studying college students in a laboratory. Although employees may not complete the same laboratory tasks as these, they may engage in similar tasks requiring verbal or creative skills (Madjar et al. 2011). Additionally, participants only had two uncivil interactions with the experimenter for the short duration of the study, whereas at work, employees might have frequent or daily uncivil interactions with coworkers/supervisors. Thus, it is possible that the present study underestimates the impacts of incivility on CBs and physiological activity.

Future research could examine the impact of real workplace incivility on employee behaviors and physiological activity via methods such as ecological momentary assessment (Park et al. 2018) and ambulatory physiological recording. This would improve external validity and allow for an examination of how repeated exposure to incivility can affect a target. Because our non-significant performance and helping behavior results could indicate small effects, future experiments could use within-subjects designs or a larger sample size to increase statistical power for detecting differences across conditions (Giumetti et al. 2013; Jackson 2017). Finally, future studies should continue to measure the medium by which incivility is delivered (face-to-face vs. cyber) to further explore their relative impacts.

In conclusion, this experiment demonstrated that brief uncivil interactions can lead to increased CBs and HR. Additionally, there is some evidence that face-to-face incivility had the strongest impact on CBs, and that cyber interactions overall had the strongest impact on HR. Practically, as organizations seek to reduce uncivil interactions across all communication types, these efforts may benefit both the employees and the organization, but future research in the workplace is needed.

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Compliance with Ethical Standards

Conflict of Interest The authors declare they have no conflicts of interest.

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