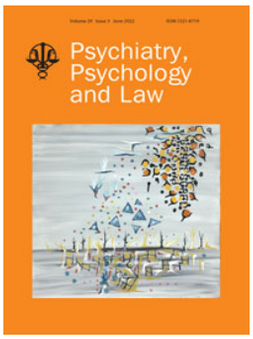

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Perceptions of familiar and unfamiliar ear- and eyewitnesses

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A witness's relationship with a defendant is frequently discussed in criminal trials, yet investigations into perceptions of this relationship have been scarce. Further, an exploration of witnesses other than eyewitnesses has been missing from the literature. The present studies explored how witness type and familiarity with a defendant impact the perceived credibility of a witness. In Study 1, a familiar earwitness was perceived as more credible and honest than a stranger earwitness but the same was not found for eyewitnesses. Results from Study 2 suggest an eyewitness was seen as more credible and believable than an earwitness, and that a familiar witness was seen as more reliable than a stranger, but not than an acquaintance. There was no impact of familiarity or witness type on legal decisions. The present studies indicate that the prior definitions of familiarity might only capture a restricted range of potentially familiar relations.

Key words: Earwitness; eyewitness; familiarity; perceived credibility; witness type.

Particularly when there is little or no physical evidence, witness evidence can become a central element in building a criminal case. As a result, the perceived credibility and reliability of witnesses become crucial in both investigative and prosecutorial decisions, as well as potentially in determining the outcome of a trial. Witnesses are assessed not only at trial by triers of fact, but also at various stages through the legal process. Witnesses might be assessed by police officers and lawyers, such as when they decide whether enough evidence is available to prosecute or when they determine which witness will be put on the stand. As such, understanding witnesses' perceived credibility is essential in understanding how a range of legal decisions are made. There are several factors that may impact perceptions of witness credibility; the present focus is on the familiarity between a witness and a defendant. Many crimes are committed by perpetrators that are unknown to a witness, but many perpetrators are also familiar (Bruer et al., 2017). In either case, identifying who committed the crime is critical to establish guilt. Accurately recalling the details of the crime may be of little use if the perpetrator is not identified. Witness recognition of a perpetrator can be based on visual exposure during the commission of a crime (i.e. eyewitness), as is most commonly studied in the witness literature (e.g. Fitzgerald & Price, 2015). However, witnesses without visual exposure during the crime might be able to identify another aspect of the perpetrator, such as their voice (i.e. earwitness). It is important to note that there may be different types of voice identification such as layperson earwitnesses, police earwitnesses

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and experts using the methods such as voice spectrography (see Morrison et al., 2016). Here, we focus on layperson earwitnesses.

Although explored substantially less frequently in the literature, earwitnesses can, and do, play an important part in the identification of perpetrators and can contribute to similar miscarriages of justice to those for eyewitnesses. For example, in the United States, at least 17 cases of wrongful convictions were due, in part, to earwitness evidence (Sherrin, 2015). As the (mis)use of voice identification can have dire consequences, it is important to explore the nature of these identifications and the impact they might have on the perceived credibility of a witness and subsequent legal decisions.

Familiarity

Witness familiarity with a suspect is among the most discussed factors by triers of fact when assessing a witness's credibility, who use this in determining likely identification accuracy (Sherrin, 2015). However, what constitutes a familiar witness–perpetrator relationship for both ear- and eyewitnesses is currently unclear. Familiarity may be conceptualized in a variety of ways. For example, familiarity has previously been defined as the relationship between two individuals, the degree of previous interaction or the number of previous exposures (see Pozzulo et al., 2019, for a comprehensive review). As demonstrated by Moreland and Beach (1992), for instance, an increase in the number of times an individual is exposed to someone can increase their feelings of familiarity towards that person, even without any interaction, a phenomenon known as the mere exposure effect. In the present study, familiarity is defined in terms of frequency of interactions.

Despite the relative lack of attention in the empirical literature to suspects that are familiar to witnesses (but see Vallano et al., 2019), many legal cases involve a witness who is familiar to the accused. For example, in an analysis of Canadian judicial decisions in which eyewitness evidence was discussed, Bruer et al. (2017) found that approximately 20% of cases involved a witness who was familiar with the defendant. The nature of prior relationships can range widely, from witnesses who have known the accused for years (e.g. *R. v Saddleback*, 2013), to others who have only met once before (e.g. *R. v Gillis,* 2008). Thus, without a clear definition of familiarity, any contact between the witness and perpetrator, whether a single instance or repeated encounters, could be characterized as familiar. As this fluid definition of familiarity may vary on a case-by-case basis, it is important to understand how differing levels of familiarity influence perceptions of witnesses.

While the precise rates of familiar versus unfamiliar voice identifications are currently unknown, the understanding of how familiarity influences credibility in the legal system seems to vary widely. In one Canadian criminal case, a judge considered an individual to be familiar enough to make a credible identification after having spoken briefly to the accused earlier in the evening of the robbery (*R. v Roberts*, 2016). Other judges have suggested that knowing someone for several years and speaking to them on a regular basis is considered familiar enough to make a credible identification and overcome other concerns regarding identification evidence (*R. v Anderson*, 2014). Thus, there is substantial discretion, and therefore plenty of room for bias or influence of extraneous factors, regarding just how much familiarity is enough to make a reliable voice identification. As such, it is important to understand how familiar and unfamiliar faces and voices are perceived by potential triers of fact.

Identification accuracy

It is generally accepted that identifying a familiar face is easier than identifying a face of a stranger; a familiar face is processed in a fundamentally different way than an

unfamiliar face (see Johnston & Edmonds, 2009, for review). Although the identification of familiar faces may be more resistant to factors that can negatively impact identification (e.g. different angles; Bruce, 1982), identification of a familiar face is not necessarily accurate. For example, a change in lighting between initial viewing of a face and identification can have a similar negative impact on familiar and unfamiliar faces, dropping accurate identification rates significantly (Hill & Bruce, 1996). Such results demonstrate that prior exposure is not the only factor that drives the influence of familiarity on identification.

Like eyewitnesses who have previously seen the perpetrator, the familiarity of a voice to an earwitness may increase their identification accuracy (Abberton & Fourcin, 1978). Yarmey et al. (2001) asked participants to listen to potentially familiar voices and make a decision about whether or not they knew who the voice belonged to. Voices that were moderately to highly familiar were identified more accurately than voices that were low-familiar or unfamiliar voices. Additionally, unfamiliar voices were mistakenly identified more than any other level of familiarity, where a mistaken identification was defined as identifying the voice as familiar but attributing it to the wrong individual. Of course, in identifications of familiar voices, false identifications still happen, even for those who have known each other for a long period of time. Yarmey et al. (2001) found that, although fewer incorrect identifications were made with familiar voices, false identification rates still ranged from 5% (high familiar) to 23% (low familiar). Similarly, Foulkes and Barron (2000) asked participants to identify a single voice of a close friend with whom they were currently living and found that 10% of identifications were mistaken. False identification rates for less familiar individuals are even more substantial (Yarmey et al., 2001). Thus, although witness–perpetrator familiarity is a contributor to witness credibility, current research suggests that it should not be the sole indicator in assessing identification accuracy.

Perceptions of witnesses

Although there has been some research examining the effect of witness–perpetrator familiarity on the perceived credibility of eyewitnesses, a gap in knowledge exists regarding perceptions of familiar and unfamiliar earwitnesses. When looking to the eyewitness credibility literature, most explorations of familiarity have used criteria related to number or duration of previous visual exposures. Lindsay et al. (1986) found no impact of familiarity (defined as 5-s exposure, 30-min exposure or 30-min exposure with conversation) on mock juror verdict decisions. Similarly, Pozzulo et al. (2014) manipulated number of prior exposures to a defendant (never seen before, 3 prior exposures, 6 prior exposures) and found no effect on verdict decisions, guilt ratings or perceptions of the eyewitness. When a witness had either zero or eight prior exposures, however, Sheahan et al. (2018) found a significant effect of familiarity on verdict decisions and guilt ratings. These findings suggest that a larger number of exposures may be required to classify a defendant as familiar enough to a witness to make a difference in identification accuracy.

Vallano et al. (2018) also examined the accused–witness relationship on the perceived credibility of a witness, defining familiarity in terms of both number of recent exposures and the recency of a previous exposure (i.e. saw a few hours ago, a few months ago). Vallano et al. (2019) found that both the number and recency of prior exposures had a small impact on participants' ratings of the defendant's likelihood of guilt, with a familiar witness resulting in higher guilty ratings than a stranger. However, an increase from somewhat familiar (i.e. seen once before, months before) to highly familiar (i.e. seen many times before, hours before) did not influence guilt ratings, demonstrating no benefit of a more familiar

witness. Pica et al. (2018) further explored familiarity of a defendant, defining familiarity in terms of the relationship between the witness and defendant. Participants were presented with a witness who had a familiar relationship (i.e. a former teacher), an acquaintance relationship (i.e. a former lunch monitor) or a stranger relationship with the defendant. When a defendant was familiar to the witness, participants assigned the defendant a significantly higher guilt rating than when the witness was a stranger. These inconsistent findings in the familiarity required to increase perceptions of witness credibility, and contribute to higher judgments of guilt, demonstrate a need to investigate further conceptualizations of familiarity.

Given that the prior research exploring witness–perpetrator familiarity has focused on eyewitness identifications, it is also important to examine whether and how the observed patterns will extend to other forms of identification, like earwitnesses. In one of very few studies examining the perceived credibility of different witness types, McAllister et al. (1993) presented participants with three types of line-up (audio, visual and audio-visual), along with a control condition. No differences in verdict decisions were found across line-up conditions, suggesting that participants viewed these varied forms of identification similarly.

Present studies

Although eye- and earwitnesses may be more accurate when identifying a familiar perpetrator than an unfamiliar perpetrator, familiarity does necessarily result in accurate identifications, and what comprises a familiar relationship is unclear. The extant literature indicates that potential triers of fact may perceive witnesses who are familiar with the perpetrator as more credible, which results in an increased perception of guilt, at least for eyewitness identifications. However, these findings have been somewhat inconsistent. Additional research is required to more clearly define what makes a witness familiar enough with the suspect to benefit from the enhanced credibility evaluations associated with identifying a familiar person. Additionally, the understanding of familiarity must be extended to other types of witnesses, like earwitnesses, who may also be tasked with identifying a familiar perpetrator, and who may fall victim to the same biases as those observed in eyewitness identifications. The present studies aim to increase the body of knowledge on familiar ear- and eyewitnesses, with a particular focus on perceived credibility.

Study 1

Method

Participants

Two hundred and forty-four adult participants took part in Study 1. Forty-four participants were excluded from the final analyses as they did not complete the study or failed one or both manipulation check questions, resulting in 200 viable participants. Participants were recruited through social media, as well as from undergraduate psychology courses from two different institutions (online: $N = 153$, undergraduate: $N = 90$). Both an online community sample and an undergraduate sample were utilized to broaden the generalizability of the current research (see Bornstein et al., 2017; Hanel & Vione, 2016, for further explanation). Participants were between the ages of 18 and 67 years ($M_{age} = 24.56$ years) and mainly female ($N = 150$). Participants were primarily Caucasian (61.20%), South Asian (14.0%) and East Asian (11.50%). Participants received compensation in the form of course credit or a $5 Amazon gift card. Assignment to conditions was quasi-random with initial participants randomly selecting a letter corresponding to a survey condition, and the remaining selected to fill conditions. This study was a 2 (witness type: earwitness, eyewitness) × 2 (familiarity: familiar, stranger) between-subjects design. Participants were

assigned to one of four conditions: earwitness/familiar ($N = 50$), eyewitness/familiar ($N = 49$), earwitness/stranger ($N = 49$), eyewitness/stranger ($N = 52$).

Procedure and materials

Data collection took place online, on the survey platforms Survey Monkey and Qualtrics. After providing consent, participants were asked to take on the role of a juror and were instructed to read a mock trial script. The mock trial described a case of breaking and entering, and kidnapping of a child. The trial began with opening statements from both parties. Next, the primary witness, the child's mother, testified about the experience and her subsequent identification of the defendant. The mother testified either that she saw the man who kidnapped her daughter in her apartment (eyewitness), or that she was blindfolded but heard him speak in her apartment (earwitness**).** Through her testimony, participants were given details about witness–perpetrator familiarity; the witness either was familiar with the defendant, as he worked at a coffee shop she frequented several times a week (familiar), or had never seen or interacted with him despite working in a similar neighbourhood (stranger). Two weeks after the crime took place, the witness made an identification of the defendant via a photo line-up or voice line-up (matched to the exposure described). The police officer who administered the identification procedure also testified, describing the details of the identification procedure, the possible problems with the identification (i.e. delayed by two weeks, impact of stress on the witness's memory) and that the identification was the main reason for charging the defendant with the crime. Both the primary witness and the police officer were questioned by the prosecution and cross-examined by the defence. No other evidence was discussed. Possible motives were presented by both the prosecution and defence in closing arguments. It was proposed by the prosecuting attorney that the accused intended to ask for ransom money as the mother's family was wealthy. However, the defence presented the case that the defendant's family was wealthy and did not require ransom money. The transcript ended with information on the specific charge and possible consequences as set forth by the *Criminal Code* provided by the judge.

After reading the mock trial transcript, participants were asked to rate the witness on a variety of factors on a 10-point Likert scale (e.g. 1 = not at all believable, 10 = very believable). Participants rated the witness's reliability, accuracy, truthfulness, believability, intelligence, understanding of the event, honesty, confidence, likeability and credibility, along with the likelihood she fabricated the event. The primary variables of interest – and the focus of our analyses – were ratings of credibility, honesty and accuracy, based on Ross et al.'s (2003) two-factor model of credibility, as well as overall assessments of reliability and believability. Participants provided a dichotomous verdict decision (guilty/not guilty), rated the likelihood that the accused committed the crime from 0% to 100% and rated confidence in their verdict decision on a scale from 0% to 100%. Beyond the legal information described above, participants were given no further judicial instructions. If they made a guilty decision, participants were asked whether they would like to provide sentencing recommendations and, if so, to determine the length of sentence that would be appropriate before the accused would be eligible for parole (from 5 to 25 years). Participants were provided with judicial instructions before deciding whether or not to recommend a sentence, with information from the judge on the standard sentence and maximum possible sentence. In addition, they were given the option to provide their own sentence or fine, ignoring the law, and were provided with possible options and descriptions for sentences (e.g. absolute discharge, imprisonment). To ensure participants attended to the

manipulations, two manipulation check questions were asked regarding the level of familiarity between the witness and accused, and the way in which the witness identified the accused. Finally, participants provided demographic information (age, gender, primary language, nationality, occupation and ethnicity). The order of questions was fixed across conditions.

Results

To determine whether there were differences between the social media recruitment and undergraduate samples, a series of *t* tests were conducted examining the impact of sample on the dependent variables of interest (i.e. perceived credibility, honesty, accuracy, believability, reliability, dichotomous verdict, likelihood of guilt). No differences were found in responses, $ps > .24$. As such, results were collapsed across samples for analyses.

Perceived credibility

Five 2×2 analyses of variance (ANOVAs) were performed to investigate the impact of familiarity (familiar, stranger) and witness type (earwitness, eyewitness) on credibility, honesty, accuracy, believability and reliability. See Table 1 for all statistical analyses. Descriptive data are provided in Table 2. There were no significant impacts of the independent variables on perceived accuracy or reliability.

There was no statistically significant main effect of familiarity or witness type on credibility ratings. There was, however, a statistically significant interaction between witness type and familiarity. To investigate the interaction, we examined familiarity within each witness type using one-way ANOVAs. For earwitnesses, familiar eyewitnesses were rated as more credible than stranger eyewitnesses, $F(1, 97) = 5.43$, $p = .02$, $\eta_p^2 = .05$. However, for eyewitnesses, no differences between familiar and unfamiliar defendants were observed, $F(1, 99) = 0.52$, $p = .47$, $\eta_p^2 = .01$.

Similar to credibility evaluations, there were no statistically significant main effects on honesty ratings. There was an interaction between witness type and familiarity on participants' ratings of honesty. Follow-up one-way ANOVAs on levels of familiarity for each witness type revealed a statistically significant difference in the earwitness condition, $F(1, 97) = 4.04$, $p = .047$, $\eta_p^2 = .04$; however, no difference was found in the eyewitness condition, $F(1, 99) = 2.88$, $p = .18$, $\eta_p^2 = .02$. Familiar earwitnesses were rated as more honest than stranger earwitnesses (see Table 2 for means).

There was no main effect of familiarity on believability. However, there was a marginal effect of witness type on believability, with eyewitnesses rated as more believable than earwitnesses. An interaction of familiarity and witness type on ratings of believability was statistically significant. Follow-up one-way ANOVAs of familiarity at both levels of witness type uncovered a statistically significant difference in the earwitness condition, $F(1, 97) = 5.04$, $p = .03$, $\eta_p^2 = .05$, but not in the eyewitness condition, $F(1, 99) = 2.55$, $p = .11$, $\eta_p^2 = .03$. Participants rated familiar earwitnesses as more believable than stranger earwitnesses.

Legal decisions

Participants made a dichotomous decision about the guilt of the accused (guilty/not guilty). See Table 3 for descriptive data. We conducted a binomial logistic regression, and the overall model was not significant, $\chi^2(3) = 1.74$, $p = .63$, indicating no relationship between familiarity or witness type and dichotomous verdict decision. Participants also rated the likelihood that the accused committed the crime. A 2 (familiarity; familiar, stranger) $\times$ 2 (witness type; earwitness, eyewitness) ANOVA resulted in no significant findings (see Table 1 for analysis and Table 2 for descriptive data).

After delivering a verdict, participants were asked to rate their confidence in their decision. Two 2 (witness type; earwitness,

Table 1. Study 1 and Study 2 statistical test results.

Effect	*F*	*df*	*p*	η_p^2
Study 1				
Credibility				
Familiarity	1.09	196	.17	.01
Witness type	0.21	196	.65	.001
Familiarity × Witness type*	5.20	196	.02	.03
Honesty				
Familiarity	0.70	196	.41	.004
Witness type	3.45	196	.07	.07
Familiarity × Witness Type*	5.94	196	.02	.03
Accuracy				
Familiarity	1.95	196	.17	.01
Witness type	1.43	196	.23	.007
Familiarity × Witness Type	0.64	196	.42	.003
Believability				
Familiarity	0.83	196	.37	.004
Witness type*	3.79	196	.05	.02
Familiarity × Witness Type*	7.64	196	.006	.04
Reliability				
Familiarity	2.79	196	.10	.02
Witness type	0.46	196	.50	.002
Familiarity × Witness Type	1.00	196	.32	.005
Likelihood of guilt				
Familiarity	0.16	196	.69	.001
Witness type	0.49	196	.48	.003
Familiarity × Witness Type	0.14	196	.71	.001
Verdict confidence: acquit				
Familiarity	2.61	156	.11	.02
Witness type	1.75	156	.19	.01
Familiarity × Witness Type	3.26	156	.07	.02
Verdict confidence: convict				

(*Continued*)

Table 1. (*Continued*).

Effect	*F*	*df*	*p*	η_p^2
Familiarity	0.81	36	.38	.02
Witness type	0.28	36	.60	.01
Familiarity × Witness Type	0.10	36	.76	.003
Study 2				
Credibility				
Familiarity	0.75	304	.47	.005
Witness type*	5.75	304	.02	.02
Familiarity × Witness Type	0.14	304	.87	.001
Honesty				
Familiarity	0.22	304	.80	.001
Witness type	3.17	304	.09	.01
Familiarity × Witness Type	0.31	304	.73	.002
Accuracy				
Familiarity	1.212	304	.33	.07
Witness type	0.62	304	.43	.002
Familiarity × Witness Type	1.53	304	.22	.01
Believability				
Familiarity	0.53	304	.59	.003
Witness type*	6.54	304	.01	.02
Familiarity × Witness Type	0.62	304	.54	.004
Reliability				
Familiarity*	3.42	304	.03	.02
Witness type	1.25	304	.27	.004
Familiarity × Witness Type	1.05	304	.35	.007
Likelihood of guilt				
Familiarity	2.26	304	.12	.02
Witness type	0.57	304	.45	.002
Familiarity × Witness Type	0.37	304	.69	.003
Verdict confidence				
Familiarity	1.19	229	.31	.01

(*Continued*)

Table 1. (*Continued*).

Effect	*F*	*df*	*p*	η_p^2
Witness type	2.00	229	.16	.01
Familiarity × Witness Type	0.27	229	.77	.002
Verdict confidence: convict				
Familiarity	1.18	69	.31	. 03
Witness type	0.19	69	.67	.003
Familiarity × Witness Type	0.42	69	.66	.01

*$p < .05$.

eyewitness) × 2 (familiarity; familiar, stranger) ANOVAs were conducted to examine verdict confidence separately for convict ($n = 40$) and acquit ($n = 160$) decisions. For those who chose to acquit, there were no significant main effects, nor a significant interaction of the independent variables on verdict confidence. Similarly, for those who convicted, there were no significant main effects or interactions present (see Table 1 for analysis and Table 2 for descriptive data).

If participants determined the accused to be guilty, they were asked whether they wanted to make sentencing recommendations. Only 10 of 40 participants who decided the defendant was guilty chose to make a recommendation for how long the defendant should serve before being eligible for parole. The mean amount of time before parole was 11.80 years ($SD = 7.47$).

Discussion

Study 1 resulted in a clear, albeit somewhat unexpected, pattern of findings. As anticipated, across ratings of witness credibility, honesty and believability, participants rated an earwitness identifying a familiar voice as more credible than an earwitness identifying an unfamiliar voice. However, the same pattern was not observed with eyewitnesses. For eyewitnesses, there were no differences between familiar and unfamiliar targets in any category. One of the only fairly consistent findings reported in the literature is that mock jurors believe visually identifying a familiar target is easier than identifying an unfamiliar target (see Pica et al., 2018, for example). Thus, it was puzzling to observe this pattern only for earwitnesses and not eyewitnesses. Perhaps the level of familiarity presented in Study 1 was not considered familiar enough by participants to result in a significant effect of familiarity. Given the consistency with which eyewitness–perpetrator familiarity has been associated with enhanced witness credibility, and our lack of observing a similar pattern despite sufficient statistical power, we sought to

Table 2. Study 1 descriptive data

	Familiar		Stranger		Total	
	M (*SD*)	95% CI	*M* (*SD*)	95% CI	*M* (*SD*)	95% CI
Earwitness						
Credibility	6.18 (1.97)	[5.59, 6.77]	5.08 (2.65)	[4.48, 5.68]	5.64 (2.38)	[5.21, 6.05]
Honesty	7.84 (1.67)	[7.19, 8.50]	6.90 (2.85)	[7.25, 7.56]	7.37 (2.37)	[6.90, 7.83]
Accuracy	5.12 (2.22)	[4.50, 5.74]	4.43 (2.80)	[3.80, 5.06]	4.78 (2.53)	[4.33, 5.22]
Believability	6.70 (2.06)	[6.09, 7.31]	5.57 (2.88)	[4.96, 6.18]	6.14 (2.55)	[5.71, 6.57]
Reliability	5.06 (1.98)	[4.44, 5.68]	4.22 (2.65)	[3.60, 4.85]	4.64 (2.36)	[4.20, 5.08]
Guilt	44.94 (24.72)	[37.52, 52.35]	42.04 (28.94)	[34.55, 49.53]	43.50 (26.80)	[38.22, 48.76]
Confidence	39.36 (34.76)	[29.96, 48.76]	54.20 (35.28)	[44.71, 63.70]	46.71 (35.63)	[40.10, 53.46]
Eyewitness						
Credibility	5.63 (1.81)	[5.04, 6.23]	5.90 (1.97)	[5.32, 6.48]	5.77 (1.89)	[5.35, 6.19]
Honesty	7.67 (1.64)	[7.19, 8.15]	8.13 (1.75)	[7.67, 8.60]	7.91 (1.70)	[7.57, 8.24]
Accuracy	5.24 (2.02)	[4.62, 5.87]	5.06 (1.76)	[4.45, 5.67]	5.15 (1.88)	[4.71, 5.59]
Believability	6.44 (1.80)	[5.84, 7.06]	7.02 (1.79)	[6.43, 7.61]	6.74 (1.81)	[6.31, 7.16]
Reliability	4.96 (2.25)	[4.33, 5.58]	4.75 (1.90)	[4.15, 5.35]	4.85 (2.07)	[4.42, 5.29]
Guilt	40.90 (25.31)	[33.41, 48.39]	40.81 (27.14)	[33.54, 48.08]	40.85 (26.14)	[35.63, 46.07]
Confidence	38.57 (32.86)	[28.08, 48.07]	40.35 (31.87)	[31.13, 49.56]	39.49 (32.21)	[32.84, 46.08]
Total						
Credibility	5.90 (1.90)	[5.49, 6.33]	5.50 (2.35)	[5.08, 5.91]	5.71 (2.14)	[5.40, 6.00]
Honesty	7.76 (1.65)	[7.34, 8.16]	7.53 (2.42)	[7.12, 7.92]	7.65 (2.07)	[7.35, 7.92]
Accuracy	5.18 (2.11)	[4.74, 5.62]	4.75 (2.33)	[4.31, 5.18]	4.97 (2.23)	[4.65, 5.27]
Believability	6.58 (1.93)	[6.14, 7.01]	6.32 (2.48)	[5.87, 6.72]	6.44 (2.22)	[6.13, 6.74]
Reliability	5.01 (2.07)	[4.57, 5.45]	4.50 (2.30)	[4.05, 4.92]	4.75 (2.22)	[4.44, 5.06]
Guilt	42.94 (24.97)	[37.65, 48.19]	41.41 (27.90)	[36.21, 46.64]	42.17 (26.43)	[38.46, 45.88]
Confidence	38.97 (33.66)	[32.29, 45.65]	47.07 (34.12)	[40.66, 53.89]	43.06 (34.05)	[38.42, 47.82]

Note: Credibility, honesty, accuracy, believability and reliability were rated on a scale of 1–10. Guilt and confidence were rated on a scale of 1–100.
CI = confidence interval.

Table 3. Study 1 frequencies of guilty verdicts.

	Familiar ($n = 99$)	Stranger ($n = 101$)	Total ($n = 200$)
Earwitness ($n = 99$)	13 (.26)	10 (.20)	23 (.23)
Eyewitness ($n = 101$)	8 (.16)	9 (.17)	17 (.17)
Total ($n = 200$)	21 (.21)	19 (.19)	40 (.20)

Note: Values denote number of guilty verdicts with proportion of total decisions in parentheses.

further explore this question by extending our manipulation of familiarity. Thus, we increased the levels of familiarity from two (familiar, stranger) to three (familiar, acquaintance, stranger) for the second study, with the new familiar condition representing an increase in frequency of interactions. This allowed us to examine whether the nature of the familiarity between the witness and the perpetrator played a role in assessing witness credibility.

Study 2

Method

Participants

Three hundred and sixty-one participants took part in Study 2. Participants were recruited from undergraduate psychology courses. Thirty-six participants were excluded from analysis due to not passing one or both manipulation check questions ($n = 28$), not completing the study ($n = 6$) or not meeting inclusion criteria (i.e. under the age of majority; $n = 2$), resulting in a total of 310 participants.[1] Participants were primarily female[2] ($n = 203$), between the ages of 18 and 34 years (M_{age} = 19.74 years, $SD = 1.99$). A large number of participants were East Asian (32.60%), Caucasian (25.50%) or South Asian (24.50%). Participants received course credit for compensation. Study 2 was a 2 (witness type: earwitness, eyewitness) × 3 (familiarity: familiar, acquaintance, stranger) between-subjects design. Participants were assigned to one of six conditions: earwitness/familiar ($N = 56$), eyewitness/familiar ($N = 52$), earwitness/acquaintance ($N = 53$), eyewitness/acquaintance ($N = 50$), earwitness/stranger ($N = 49$), eyewitness/stranger ($N = 50$).

Procedure and materials

Study 2 followed the same procedure as that of Study 1, with minor changes to the mock trial script. It is possible that the lack of an effect of eyewitness familiarity and the uneven conviction decisions observed in Study 1 were due to the case materials presented (e.g. motive was not believable). As such, the materials were altered for Study 2. The level of familiarity was increased from two levels to three. The witness was depicted as having interacted with the accused almost every day in a local coffee shop where he worked (familiar), interacted 2–3 times a week while ordering coffee (acquaintance) or not interacted at all (stranger). When the witness was familiar or an acquaintance, details about their interactions were provided (e.g. did not speak much but spoke about their families). The depth of interaction did not increase across conditions; only the frequency did. The frequency of interactions in the acquaintance condition in Study 2 was equivalent to the familiar condition in Study 1. To increase the believability of the prosecution's case (i.e. that the accused would kidnap the witness's daughter), it was noted that in the familiar conditions, the accused had also previously

[1]An additional 15 participants were randomly selected and excluded to obtain more equal sample sizes across all conditions.

[2]One participant identified as non-binary, and one participant identified as gender neutral.

interacted with the child. Aside from the comment on prior interactions with the child, the motivation and arguments presented by either side (e.g. kidnapping with intention to demand ransom money, defendant came from a wealthy family and had no need for money) remained the same as those in Study 1 across conditions. The manipulation check questions were updated to reflect the new design. Finally, due to an administrative error, the confidence rating was made on a 1–10 scale, rather than a 1–100 scale as in Study 1.

Results

Perceived credibility

Five 3 × 2 ANOVAs were conducted to investigate the impact of familiarity (familiar, acquaintance, stranger) and witness type (earwitness, eyewitness) on the dependent variables of interest: credibility, honesty, accuracy, believability and reliability. See Table 1 for all statistical analyses. Descriptive data are provided in Table 4. There were no significant findings with respect to perceived honesty or accuracy.

There was no statistically significant main effect of familiarity on ratings of credibility, but there was a statistically significant main effect of witness type. Participants found an eyewitness to be more credible than an earwitness (see Table 4). There was no statistically significant interaction.

There was no main effect of familiarity on participants' believability ratings. However, a statistically significant main effect of witness type on witness believability was observed, with participants rating an eyewitness as more believable than an earwitness. An interaction between familiarity and witness type on ratings of believability, however, was not statistically significant.

There was a statistically significant main effect of familiarity on perceived accuracy of the witness. Tukey's post hoc analyses revealed that there was a difference between the highest and lowest level of familiarity, $p = .05$, with participants believing a familiar witness to be more reliable than a stranger. The acquaintance condition did not differ from either the familiar witness ($p = .10$) or the stranger ($p = .94$). There were no other significant differences. There was also no statistically significant main effect of witness type on accuracy, nor was there a significant interaction.

Legal decisions

Participants made a dichotomous decision about the guilt of the accused (guilty/not guilty). See Table 5 for descriptive data. A binomial logistic regression was conducted to determine the impact of familiarity and witness type on dichotomous verdict decisions. The overall model was not significant, $\chi^2(3) = 1.64$, $p = .65$. Participants also rated the likelihood that the accused committed the crime. A 3 (familiarity; familiar, acquaintance, stranger)× 2 (witness type; earwitness, eyewitness) ANOVA resulted in no significant effects or interactions (see Table 1 for analysis and Table 4 for descriptive data).

After delivering a verdict, participants rated their decision confidence on a scale from 1 to 10. Two 3 (familiarity; familiar, acquaintance, stranger)× 2 (witness type; earwitness, eyewitness) ANOVAs were conducted separately on acquit and convict decisions. For both those who decided to acquit ($n = 235$) and those who decided to convict ($n = 75$), there were no statistically significant findings (see Table 1 for analysis and Table 4 for descriptive data).

Participants were also asked whether they wanted to make sentencing recommendations for the accused. One hundred and twenty-six participants chose to make a recommendation for how long the defendant should serve before being eligible for parole. The mean amount of time before parole was 5.67 years ($SD = 2.50$).

Table 4. Study 2 descriptive data.

	Familiar		Acquaintance		Stranger		Total	
	M (*SD*)	95% CI	*M* (*SD*)	95% CI	*M* (*SD*)	95% CI	*M* (*SD*)	95% CI
Earwitness								
Credibility	5.25 (2.13)	[4.76, 5.74]	5.47 (1.83)	[4.97, 5.97]	5.33 (2.19)	[4.76, 5.74]	5.35 (2.04)	[5.06, 5.64]
Honesty	7.27 (1.61)	[6.80, 7.74]	7.20 (1.83)	[6.71, 7.67]	7.37 (2.15)	[6.87, 7.87]	7.27 (1.85)	[7.00, 7.55]
Accuracy	4.86 (1.89)	[4.37, 5.35]	4.92 (1.83)	[4.42, 5.43]	4.90 (2.02)	[4.38, 5.42]	4.89 (1.90)	[4.60, 5.19]
Believability	6.13 (1.99)	[5.62, 6.63]	6.28 (1.98)	[5.76, 6.80]	5.73 (2.32)	[5.19, 6.28]	6.06 (2.09)	[5.74, 6.35]
Reliability	5.07 (1.83)	[4.57, 5.57]	4.66 (1.98)	[4.15, 5.18]	4.82 (2.14)	[4.28, 5.35]	4.85 (1.97)	[4.55, 5.15]
Guilt	44.93 (23.61)	[38.18, 51.68]	43.08(24.13)	[36.14, 50.02]	38.96 (30.01)	[31.74, 46.18]	42.46 (25.88)	[38.30, 46.35]
Confidence	7.00 (2.22)	[6.45, 7.55]	7.30 (2.03)	[6.73, 7.90]	7.51 (2.45)	[6.92, 8.10]	7.26 (2.23)	[6.94, 7.60]
Eyewitness								
Credibility	5.79 (1.61)	[5.28, 6.30]	6.10 (1.76)	[5.58, 6.62]	5.68 (1.50)	[5.16. 6.20]	5.86 (1.63)	[5.56, 6.16]
Honesty	7.46 (1.71)	[6.98, 7.95]	7.76 (1.71)	[7.27, 8.25]	7.68 (1.61)	[7.19, 8.17]	7.63 (1.67)	[7.35, 7.92]
Accuracy	5.54 (2.02)	[5.03, 6.05]	4.80 (1.68)	[4.28, 5.32]	4.84 (1.68)	[4.32, 5.36]	5.07 (1.83)	[4.76, 5.36]
Believability	6.70 (1.90)	[6.16, 7.22]	6.54 (1.97)	[6.00, 7.08]	6.60 (1.34)	[6.06, 7.14]	6.61 (1.75)	[6.30, 6.92]
Reliability	5.65 (1.83)	[5.13, 6.17]	4.98 (1.71)	[4.45, 5.10]	4.64 (1.93)	[4.11, 5.17]	5.10 (1.86)	[4.79, 5.40]
Guilt	45.31 (23.99)	[38.71, 52.72]	48.84(26.61)	[41.67, 55.99]	39.04 (24.99)	[31.90, 46.19]	44.55 (25.57)	[40.43, 48.63]
Confidence	7.52 (1.69)	[6.95, 8.09]	7.56 (2.19)	[6.98, 8.14]	7.88 (1.97)	[7.30, 8.46]	7.65 (1.95)	[7.32, 7.99]
Total								
Credibility	5.51 (1.91)	[5.17, 5.87]	5.78 (1.82)	[5.43, 6.15]	5.51 (1.88)	[5.14, 5.87]	5.60 (1.87)	[5.40, 5.81]
Honesty	7.36 (1.66)	[7.03, 7.70]	7.47 (1.78)	[7.13, 7.82]	7.53 (1.89)	[7.17, 7.88]	7.45 (1.77)	[7.26, 7.65]
Accuracy	5.19 (1.97)	[4.85, 5.55]	4.86 (1.75)	[4.50, 5.22]	4.87 (1.85)	[4.50, 5.24]	4.98 (1.86)	[4.77, 5.19]
Believability	6.40 (1.96)	[6.04, 6.78]	6.41 (1.97)	[6.04, 6.79]	6.17 (1.93)	[5.78, 6.55]	6.33 (1.95)	[6.11, 6.55]
Reliability	5.35 (1.84)	[5.00, 5.72]	4.83 (1.85)	[4.45, 5.19]	4.73 (2.02)	[4.35, 5.12]	4.97 (1.92)	[4.76, 5.18]
Guilt	45.31 (23.99)	[40.46, 50.19]	45.87(25.40)	[40.98, 50.94]	39.00 (27.45)	[33.92, 44.08]	43.48 (25.71)	[40.55, 46.30]
Confidence	7.25 (1.99)	[6.86, 7.66]	7.43 (2.10)	[7.02, 7.84]	7.70 (2.22)	[7.20, 8.11]	7.45 (2.10)	[7.23, 7.70]

Note: Credibility, honesty, accuracy, believability, reliability and confidence were rated on a scale of 1–10. Guilt was rated on a scale of 1–100. CI = confidence interval.

Table 5. Study 2 frequencies of guilty verdicts.

	Familiar ($n = 108$)	Acquaintance ($n = 103$)	Stranger ($n = 99$)	Total ($n = 310$)
Earwitness ($n = 158$)	13 (.23)	14 (.26)	11 (.22)	38 (.24)
Eyewitness ($n = 152$)	14 (.27)	15 (.30)	8 (.16)	37 (.24)
Total ($n = 310$)	27 (.25)	29 (.28)	19 (.19)	75 (.24)

Note: Values denote number of guilty verdicts with proportion of total decisions in parentheses.

Discussion

There were several differences observed between the two studies. While Study 1 resulted in no overall significant differences in witness type, in Study 2 eyewitnesses were rated as more credible and believable than earwitnesses. Additionally, Study 1 demonstrated an effect of familiarity on earwitnesses' credibility and believability, yet there were no interactions between familiarity and witness type in Study 2. Finally, in Study 2, a familiar witness was viewed as more reliable than a stranger, but not than an acquaintance, whereas there was no impact of the independent variables on reliability in Study 1. There was no impact of familiarity or witness type on verdict decisions or verdict confidence in either study.

General discussion

The present studies explored the impact of familiarity on different types of witnesses' perceived credibility. Previous research has examined the impact of witness–perpetrator familiarity, defining it in terms of relationship, frequency and recency of encounter, but has focused solely on eyewitness testimony. Exploring the perceived credibility of different types of familiar witnesses whose evidence may be required in the legal system is integral to understanding how the relationship between a witness and perpetrator can influence perceptions of both eyewitnesses and earwitnesses. As both earwitnesses and eyewitnesses are relied upon for evidence in the justice system, it is important to understand how both types of witness are assessed.

In Study 1, there was an impact of witness–perpetrator familiarity among earwitnesses, but not among eyewitnesses. This finding suggests that potential triers of fact may have a different threshold at which familiarity boosts credibility for earwitnesses than for eyewitnesses. Voice identification may be more novel to participants, and they might not have determined the level of familiarity at

which they consider a witness to be credible. Any level of familiarity might be enough to boost the credibility of an earwitness, while perhaps the same is not true for eyewitnesses. However, the same effect of familiarity on the perceived credibility of an earwitness was not found in Study 2. The inconsistent findings suggest a need for further examination of the impact of familiarity on the perceived credibility of earwitnesses.

Despite the relatively consistent finding in the literature that an eyewitness identification of a familiar perpetrator will be perceived as more credible than an eyewitness identification of an unfamiliar perpetrator, we did not observe this pattern in either of our experiments. In our view, the most likely explanation for why we did not observe this seemingly intuitive and consistently observed effect is that our particular manipulation of familiarity may not have accessed the same construct as prior literature. In the present studies, all levels of familiarity were relatively minor. The connection between the witness and defendant was never stronger than a short daily interaction, while previous research has assessed longer and deeper relationships (e.g. teachers). As there was only one significant effect of familiarity of eyewitnesses across both studies, it could be that participants did not find the level of familiar relationship described to be familiar enough to cross a familiarity threshold. Some previous research (e.g. Lindsay et al., 1986) has also demonstrated that participants did not view a witness who had familiarity with a suspect as more credible than one who was a stranger. Participants may have felt that the level of interaction depicted in the current studies (e.g. interaction with a barista at a coffee shop) was not sufficiently familiar to boost the credibility of the witness beyond what they may normally be perceived to be. This points to an important consideration that requires further exploration. What a trier of fact might consider familiar might be rather different from how researchers (or lawyers) define familiar relations. What familiar means must be more clearly defined to align researchers' terminology with potential jurors' conceptualizations.

It is also likely that there is no uniform threshold that makes a witness familiar with a perpetrator, but that there is instead a complex interplay of factors that contributes to what threshold is required, given a particular set of circumstances. One can imagine that duration of exposure to the perpetrator at the time of the crime, the context under which familiarity was established (including frequency, number and quality of exposures), the time passed since last exposure and even the severity of the crime would all interact to influence how potential triers of fact evaluate the impact of witness–perpetrator familiarity on witness credibility. These findings, we argue, contribute to the case that familiarity is not as simple as frequency of exposure.

Finally, the present set of studies also revealed a fairly consistent difference in the perceptions of earwitnesses and eyewitnesses. Where differences existed, participants viewed eyewitness testimony more favourably than they did earwitness testimony. This pattern contradicts previous findings (McAllister et al., 1993) that suggested that triers of fact have similar confidence in earwitness and eyewitness testimony. The previous research in the area was conducted close to 30 years ago. The present studies suggest that there could have been a shift in the common knowledge of triers of fact regarding eye- and earwitness identifications; however, further research is needed to explore this possibility further.

There was also no impact of familiarity or witness type on legal decisions in either Study 1 or Study 2. In the present context, any impact of familiarity or witness type on the perceived credibility of the witness may not have been substantial enough to influence verdict decisions. As suggested by the relatively low number of conviction decisions (and moderate continuous likelihood of guilt ratings), participants may have been cautious when applying

the decision threshold of *beyond a reasonable doubt*. The cases at hand may have left participants with enough doubt in the guilt of the perpetrator that they were uncomfortable rendering a guilty verdict decision. Therefore, more work that varies case type is needed to explore how familiarity impacts verdict.

Yet, understanding how familiarity and witness type impact witness credibility remains important, regardless of the impact on legal decisions. Witness credibility will be assessed throughout the investigative and legal process, from the first police interview, to decisions about who should testify, above and beyond legal decisions. Understanding how familiar and unfamiliar ear- and eyewitnesses are perceived allows for a better understanding of how such witnesses are evaluated at any stage of the journey through the justice system.

Limitations and future directions

If triers of fact have only a witness's testimony to rely upon in making their decision, any helpful or hindering factor in perceived credibility can be critical in informing verdict decisions. As witnesses and defendants may often know each other (Bruer et al., 2017), it is important to understand how this relationship can impact how a witness is evaluated. Our findings suggest that potential triers of fact may have a high threshold for the level of familiarity that they believe will increase the accuracy of an eyewitness identification, although this threshold may be lower for earwitnesses.

Additionally, we observed impacts of the independent variables on the perceived credibility of the witness, but not on legal decisions. As noted above, the lack of legal decision effects may be due to the nature of the case presented; participants may not have found the prosecution's case strong enough to convict, no matter the strength of the witness's testimony, as evidenced by the high number of acquittals in Study 1. The argument presented in the mock trial for Study 2 was designed to help strengthen the case against the defendant to help counteract this possible limitation, but a similar pattern emerged. Future research should explore the effect of additional evidence or alternative motivations on verdict decisions in a similar context.

Further, all participants were asked to make credibility decisions, followed by legal decisions. This order was intended to mirror a real-world scenario in which triers of fact make implicit credibility judgements during a trial before rendering a verdict. Also, by asking for credibility ratings first, it allowed us to explore the influence of familiarity on credibility independent of verdict decisions – which may better reflect how other legal decision-makers perceive witnesses (i.e. law enforcement). Of course, to disentangle differential influences on perceptions of credibility and legal processes, one must counterbalance order of these questions. Given the patterns observed in the present studies, we believe such a disentangling would be worthy of investigation in future research. Further, investigating the potential for perceived credibility to act as a moderator or mediator for legal decisions may be an exciting next step to take.

The lack of significant differences in credibility between familiar and unfamiliar witnesses, except when interacting with witness type, indicates that the relationship presented here was not strong enough to increase eyewitness credibility. After observing the lack of familiarity effect on eyewitnesses in Study 1, the familiarity of the case and materials were strengthened in Study 2. Yet, similar results were found. Further research exploring different levels of earwitness familiarity, manipulating factors described earlier that could refine understanding of familiarity, is required to understand the impact on perceived credibility. The present research is an important early step in this important investigation.

Conclusion

The current research demonstrated that potential triers of fact might require a strong

relationship between a witness and a suspect to be considered familiar enough that their identification increases in value. Understanding the nature and quality of interactions that contribute to perceptions of familiar ear- and eyewitnesses is critical to understanding how such evidence is evaluated by potential triers of fact. The present studies indicate that prior definitions of familiarity might only capture a restricted range of potentially familiar relations.

Ethical standards

Declaration of conflicts of interest

Madison B. Harvey has declared no conflicts of interest.
Kaila C. Bruer has declared no conflicts of interest.
Heather L. Price has declared no conflicts of interest.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Simon Fraser University Research Ethics Board and the University of Regina Research Ethics Board and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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