Exploring cultural differences in eyewitness accounts using a self-administered reporting technique

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Abstract

In a globalised world, investigators often interact with witnesses from diverse cultural backgrounds. To date, there is a wealth of research on the use of evidence-based practices to facilitate recall and reporting in information elicitation contexts. However, research has been primarily conducted with participants from western (and typically individualistic) cultural contexts, ignoring the potential effects of cultural communication norms on memory reporting among other factors. We compared reports provided by two samples that contrast on the individualist-collectivist dimension (UK vs Lebanon). Participants (N = 118) witnessed a staged crime event and provided an account (in their native language) using a self-administered Timeline Technique or a Free Recall format, before responding to cued recall questions. As in previous research, UK participants reported more correct information when using the Timeline Technique compared to free recall. Contrary to hypotheses, participants in Lebanon provided a similar amount of information across reporting format conditions. Overall, Lebanese participants provided fewer correct details both in spontaneous self-administered reporting formats and in cued recall, compared to their UK counterparts. These findings have implications for information-gathering practices in cross-cultural interactions and highlight the (potential) need to modify existing techniques for different cultural contexts.

Keywords: culture, interviewing, self-administered interview, timeline technique, cross-cultural communication, eyewitness memory

In an increasingly globalised world, the pursuit of justice often relies on productive interactions between witnesses and investigators from diverse cultural backgrounds. The success of these interactions likely depends on several factors, not least that cross-cultural differences in both cognition and communication preferences or norms may affect the efficacy of investigative interviewing techniques (see Hope et al., 2021). To date, however, limited research has examined the extent to which existing techniques, generally developed and tested in Western and broadly individualistic contexts, are effective in non-Western and/or broadly collectivistic contexts. In light of limited insights with respect to these issues in the wider investigative interviewing literature, we compared the accounts provided by mock witnesses drawn from a UK sample and mock witnesses drawn from a Lebanese sample. We also examined whether a technique with documented efficacy in increasing the information reported by mock witnesses in a UK context would show the same effects in a sample of Arabic-speaking Lebanese mock witnesses. The overarching aim of the current research was to identify any systematic patterns of reporting differences between both groups that may be attributable to cultural factors: describing the nature of such differences is likely to be informative for both researchers and practitioners as this field develops.

Why might culture affect the content of an eyewitness report?

Culture might be defined as a 'dynamic and complex set of shared systems, meanings, and practices within a social group, emerging from the histories and experiences of that group and shaping social interactions and relationships at all levels from the individual to the wider society' (Hope et al., 2021, p.3). Wang (2021) described memory as "an open system saturated in cultural contexts" (p.153) that is shaped by the dynamic forces of culture, as indeed are many other cognitive processes associated with memory. Therefore, irrespective of whether a witness interview involves a cross-cultural component in the interview room or not, differences in reports provided across cultures may reflect differences in processing,

interpretation, or prioritisation of information concerning a witnessed event.

Recently, research has begun to examine how reports of witnessed events differ between cultures. For example, using a mock witness paradigm, Anakwah et al. (2020) examined free recall reports for crime-relevant scenes provided by participants recruited in a Sub-Saharan African country (Ghana) and participants recruited in Northern Europe (UK and The Netherlands). The UK and The Netherlands both score high on individualism and low on power distance, two cultural dimensions originally identified in Hofstede's work on the classification of national cultures (Hofstede, 1983; Hofstede, Hofstede, & Minkov, 2010)[1], while the opposite pattern is true for Ghana where a more collectivist orientation prevails at the societal level. Broadly speaking, the individualism-collectivism cultural dimension reflects the degree to which individuals in a society are integrated into social groups and embedded in social relationships (Hofstede, 1983; Hofstede et al., 2010; although see Sharma, 2010). Accordingly, individualist societies tend to focus and place value on individual achievements, rights and needs whereas collectivist societies place greater importance on the achievements, rights and needs of the group. Meanwhile, power distance reflects the extent to which members of a society perceive inequality in power, prestige and wealth. Societies that endorse a high power distance tend to be more accepting of an unequal distribution of power, imposition of hierarchy and the role of authorities (cf. low power distance societies where equality is prized or sought; Oysermann, 2006).

In Anakwah et al., (2020), participants with a collectivistic cultural orientation (attributed at the country level in accordance with Hofstede's individual-collectivism index scores) reported significantly fewer details about the crime scenes in their memory reports than participants with an individualistic cultural orientation. The difference between cultural

[1] Hofstede's individualism-collectivism index estimates the extent to which countries are individualistic and collectivistic in orientation. See https://www.hofstede-insights.com/product/compare-countries/

groups with respect to the quantity of correct details reported is concerning given that informativeness is prized in investigative settings: witness accounts lacking in details are unlikely to further a case. It is notable that this tendency towards underreporting of details by the sub-Saharan African participants has now been replicated in other studies using an eyewitness paradigm with samples comparable across age, language, and education levels (see Anakwah et al., 2020; Anakwah, 2021; for complementary results in other interviewing contexts, see Leal et al., 2018; Taylor et al., 2017).

How might these observations be accounted for with reference to cultural theory? While there are a number of possible accounts, perhaps the most important of these identified in the wider literature on culture and memory relates to the meaning of self in relation to others, or self-construal (Markus & Kitayama, 1991; Gutchess & Sekuler, 2019; see Wang, 2013, for extended discussion). According to self-construal theory, the social context in which an individual is socialised promotes the development of either an independent or an interdependent construal of the self. Thus, individuals socialised in individualistic cultures, where people are less embedded in social relationships, develop an independent self-construal, while those socialised in collectivistic cultures, where stronger in-group social bonds exist, develop an interdependent self-construal (although it is worth noting that there is sizeable variation within countries at the level of independent and interdependent self construals, see Fischer and Schwartz, 2011). It may be that cultural differences in independent-interdependent self-construal leads to cultural differences in elaborative memory reporting.

In a recent review examining culture and memory in the context of witness interviewing, Hope et al. (2021) highlighted an important observation in the culture and memory literature: that individuals from cultures that emphasise independent self-construal tend to be more elaborate and detailed in their memory reports than individuals socialised in

cultures that emphasise the interdependent self-construal (Ross & Wang, 2010; Wang, 2001, 2004; Wang et al., 2017). In fact, autobiographical memory accounts provided by individuals from more individualistic cultures, tend to reveal more personal information, focus more on the self, and include longer accounts of specific events than accounts provided by individuals from collectivistic cultures (Humphries & Jobson, 2012; Wang, 2013).

Such differences may reflect communication preferences. For example, low context communication is factual, direct, linear and is characteristic of Western (individualistic) communication. However, communication in high context (collectivistic) cultures tends to be more indirect and context-oriented (Gudykunst, Ting-Toomey, & Chua, 1988). The implications of these differences in communication preferences are significant in the context of witness accounts. Specifically, high context communications, preferences may underpin less detailed, precise, or linearly ordered accounts. Given that investigators in Western contexts are typically focused on accessing facts and specific details in the most direct manner possible, high context communication styles may be perceived as uncooperative or less forthcoming (Beune, Giebels, & Taylor, 2010).

Another possibility is that differences in the quantity of information reported reflect cultural differences in memory specificity. Memory specificity relates to memory for specific features of, for example, objects or past experiences (Schacter et al., 2009). Millar et al. (2013) found cultural differences such that North Americans provided more precise memory reports for object details than East Asians (see also Leger & Gutchess, 2021, for similar findings with respect to memory specificity).

Integrating the theoretical accounts and findings described in the literature on culture and memory, it is clear then that there are several possible explanations that may account for this pattern of apparent under-reporting by the sub-Saharan mock witnesses relative to their northern European counterparts in the work by Anakwah et al. (2020a & b). For example,

taking a developmental perspective, some research has noted that parents in individualistic cultures tend to provide more feedback to children in the course of conversations than those in collectivistic cultures (Wang, 2004). It may be the case that, through socialisation affordances, norms for linguistic elaboration are transmitted that account for less elaborated spontaneous reporting (Peterson, Sales, Rees, & Fivush, 2007). Patterns of apparent under-reporting might also be linked to different cultural tendencies with respect to self-effacement and self-enhancement (Chiu et al., 2010; Takata, 2003; Yamagishi et al., 2012) associated with the independent-interdependent construal of the self, described above (Markus & Kitayama, 1991; Anakwah, 2022).

In light of the limited findings in the applied memory literature, we wondered whether similar findings might be observed in a mock witness paradigm in a different culture typically categorized as collectivistic (according to Hofstede 1980; 2001) or interdependent (Markus & Kitayama 1991; Schwartz, 1992; Triandis, 1995) in comparison to a UK sample. One key goal of the current research was to establish whether previous findings by Anakwah et al. (2020) in a sample in sub-Saharan Africa replicate in a very different cultural context, albeit one similarly aligned according to Hofstede's individual-collectivist index.

Going beyond Anakwah et al. (2020), who collected only free and cued recall reports, we further considered whether a self-administered reporting technique might eliminate cultural factors pertaining to power distance as a function of verbal reporting to an interviewer. Cultural differences in power distance and associated authority may also affect interactions during investigative interviews (Goodman-Delahunty & Howes, 2016). Hierarchy in communication norms in high power distance cultures may make it difficult for subordinates to express their views to superiors or authority figures (Ghosh, 2011; Khatri, 2009). As a result of an inherent power distance between an interviewer and a witness, free and spontaneous accounts may be inhibited in investigative interviews. Use of a mainly self-

administered technique allows for an examination of memory reporting without the influence of related social dynamics that might affect spontaneous accounts in high power distance cultures.

Obtaining information using self-administered reporting tools

Over the past decades, a number of self-administered reporting tools and techniques that draw on existing best-practice approaches to investigative interviewing for eliciting information from witnesses and victims have emerged from research (see Hope & Gabbert, 2019). One such approach is the Timeline Technique. Dispensing with the linear verbal narrative common to most interviewing formats, the Timeline Technique is designed to facilitate witness reporting about complex event sequences, such as events with multiple perpetrators (Hope et al., in press; Hope et al., 2019; Hope et al., 2013; Kontogianni et al., 2018; see also Leins et al., 2014). Drawing on social survey methodologies (e.g., event history calendars) used previously to elicit information about autobiographical events (e.g., Belli et al., 2009; van der Vaart, 2004), this technique is a self-administered recall and reporting technique designed to facilitate an interviewee's ability to recall information within a particular time period in sequence, identify people involved and link those people with their specific actions. Specifically, this approach attempts to capitalise on evidence suggesting that episodic memory is temporally ordered, and that temporal context plays an important role in the retrieval process (see Tulving, 1983; also Howard & Kahana, 1999; Kahana, 1996; Unsworth, 2008).

In the first test of the timeline technique, participants reported their account of a witnessed event on a 'timeline' of the relevant time period for the target event. Additional retrieval support was provided through the use of instructions and interactive reporting materials. Mock witnesses who provided their accounts about a multi-perpetrator event using a Timeline Technique provided, overall, more correct details, including more person-

description details, person-action details (i.e., details linking persons to actions), and sequence details than participants requested to provide a free report, at no cost to accuracy (Hope et al., 2013). Kontogianni et al. (2018) noted a beneficial effect of using self-generated cues to further enhance reporting in conjunction with the Timeline Technique while Hope et al. (2019) observed beneficial effects of reporting using a timeline approach when eliciting information about 'who said what' in conversational recall (see also Kontogianni et al., 2021). To date, however, the Timeline Technique has only been empirically tested using English-speaking participants in individualistic/low power distance cultures.

The main objective of the current research was to (i) compare the memory reports provided by mock witnesses from two cultures that contrast on key cultural dimensions, and (ii) assess the performance of the Timeline Technique as a self-administered reporting format in comparison to a standard free recall format between those cultures. According to some metrics (e.g., https://www.hofstede-insights.com/country-comparison/lebanon/), Lebanon contrasts in meaningful ways to the UK on two key constructs relevant for the current research (although see Discussion). Specifically, Lebanon scores higher on power distance (62: Lebanon vs 35: UK) and lower on individualism (43: Lebanon vs 89: UK). Lebanon is an interesting country in which to conduct research not only due to its location in a Middle Eastern context but also because it is a country that is diverse in terms of religious and sectarian composition and to an extent ethnic composition (e.g., a sizable and naturalised Armenian ethnic minority).

In both samples, we compared reports in terms of the quantity, type of detail, and accuracy of information provided. Our pre-registered hypothesis was that participants providing their accounts using the timeline reporting method would provide more information, in both samples, than participants in the free recall reporting condition. In light of previous findings (Anakwah et al., 2020), we expected that participants in Lebanon would

provide less information overall than participants in the UK. We also used a cued recall task to assess any differences in response to questioning as opposed to spontaneous reporting from memory although in the absence of relevant prior data we did not specify directional hypotheses for performance on the cued recall task.

In terms of other exploratory considerations, the Lebanese Arabic-speaking sample also offered an interesting contrast to an English-speaking sample as we were also keen to test a sample where the language takes a different form to that of the Latin Alphabet used in core European languages. A notable feature of reading/writing in Arabic is that it runs from right to left whereas to date the timelining approach has only been tested on samples using writing forms that run from left to right. Research has shown that the direction of writing in an individual's native language affects how they represent time spatially (Bergen & Chan Lau, 2012; Fuhrman & Boroditsky, 2010). Specifically, Fuhrman & Boroditsky (2010) found that native English speakers arranged temporal sequences from left to right, while native Hebrew speakers arranged them from right to left, in accordance with the direction of writing in their native tongue. We set out to observe this aspect in an exploratory manner (although it should be noted that use of the timeline format does not explicitly impose any constraints on reporting direction or approach; participants are instructed to record their memories in whatever order they wish). The hypothesis, power analysis and analysis plan were pre-registered [see https://osf.io/ztrjf; dataset also available].

Method

Design and Participants

The design of this experiment was a 2 (Cultural Group: Lebanon vs. UK) x 2 (Reporting Format: Timeline vs. Free Recall) between-subjects factorial design. Power

analysis for a one-way ANOVA with four groups[2] was conducted in G*Power to determine a sufficient sample size using an alpha of 0.05, a power of 0.95, and a large effect size (f = 0.40) (Faul et al., 2009), drawing on Hope et al. (2013). Based on these assumptions, the minimum sample size was set at 112. Our recruited sample was 120 participants comprising 60 native Lebanese individuals (who were bilingual Arabic speakers) located in Lebanon and 60 native British individuals (English speakers) located in the UK. In both locations, participants were recruited from student and community-based samples via online platforms and local advertising (although the majority of the sample comprised students at both test locations). From our original sample, we eliminated two individuals who exceeded the pre-registered age-boundary for participation (45 years). The final sample comprised 118 individuals who were aged 18-43 years old (M = 24.61, SD = 5.63), 86 of whom were female (73%) with a minimum of college level education and corrected vision as necessary. The gender composition of samples at each location was very similar (UK females = 42; Lebanon females = 44); however, the UK sample was, on average, older than the Lebanese sample, although the majority of both samples were individuals in their twenties (UK M = 27 years, Lebanon M = 22 years; t (97.17) = 5.79, p < .001).

All participants received the equivalent of GBP5 for participation. As described in the pre-registration, the dependent measures for confirmatory analyses of initial accounts were the number of overall correct and incorrect details reported, the accuracy rate for information reported, person-action details reported, sequence errors and overall accuracy rate. For the cued recall task, the dependent measures for confirmatory analyses were the number of questions answered correctly, incorrectly, with a Don't Know response (or no response), and

[2] This was mistakenly reported as a one-way ANOVA with four groups in the pre-registration. The appropriate test (which is reported later) is a two-way ANOVA. The estimated sample size is the same for both tests so the result of the power analysis calculation remains valid for our tests and hypotheses. The power analysis is based on the expected effects for reporting format based on previous findings. Effect size estimates for cultural differences in reporting in a mock witness paradigm were not available to inform estimates at the time of pre-registration.

overall accuracy rate. This research was assessed by the Science Faculty Ethics Committee at [redacted for review; approval code: XXX]

Materials

Culture orientation scale. We used the culture orientation scale (Triandis & Gelfand, 1998) to measure self-reported individualism and collectivism of participants as an exploratory measure. The scale has 16-items with a nine-point Likert scale (1 = *never* or *definitely no* and 9 = *always* or *definitely yes*) and comprises four subscales: vertical individualism (VI), horizontal individualism (HI), vertical collectivism (VC) and horizontal collectivism (HC).[3] Sample items on the scale include: VI – *"winning is everything"*; HI – *"I often do my own thing"*; VC – "*Parents and children must stay together as much as possible";* and HC – *"If a co-worker gets a prize, I would feel proud".* Only one subscale was rated significantly differently between groups (HI; $t(116) = 4.56$, $p < .001$, $d = 0.84$)[4], although we note that this is consistent with findings reported elsewhere in recent literature (e.g., Anakwah et al., 2021; see Discussion),

Stimulus event. The stimulus event was a simulated crime film portraying a home invasion robbery. In the event, two perpetrators force their way into a young female victim's apartment under the pretence of being utility engineers and proceed to threaten her with a

[3] Vertical individualism refers to individualistic cultures where hierarchy is emphasised in social relationships; horizontal individualism refers to individualistic cultures where equality is emphasised in social relationships; vertical collectivism refers to collectivistic cultures where hierarchy is emphasized in social relationship; and horizontal collectivism refers to collectivistic cultures where equality is emphasized in social relationships (Triandis & Gelfand, 1998).

[4] It is important to note that the Lebanese participants in our study were young, educated urban dwellers. Anakwah et al. (2020a) found that young, educated, urban participants from Ghana scored higher on horizontal individualism than participants from the Netherlands. Similarly, the Lebanese participants in this study scored higher on horizontal individualism than the UK participants. It is, therefore, important to acknowledge the differences in self-construal that can occur within a culture. For example, Kitayama et al. (2006) found that Japanese individuals from Hokkaido had a more independent social orientation than those from the mainland. Some researchers have also noted that self-construal scales often fail to show predicted cultural differences (Harb & Smith, 2005; Vignoles et al., 2016).

baseball bat while searching the property for valuables. They use the bat to break a number of items and leave the property with cash, jewelry, a laptop, mobile phone and other items. The event lasted 124 secs and was presented without the accompanying soundtrack. This event was selected for the current research as it reflected the kind of opportunistic break-in that could feasibly occur in any metropolitan environment. Additionally, the perpetrators wore disguises that made it difficult to determine their ethnicity (i.e., it was not evident where this crime took place or who committed it).

Timeline Technique. The Timeline Technique, adapted from Hope et al. (2013), comprised three elements: (1) a physical cardboard timeline (33 in. x 12 in.) that has a horizontal line running at mid-point from one end of the card to the other representing the temporal context during which the event occurred; (2) blank, white, lined person description cards (5 in. x 3 in.); (3) blank yellow action cards with a semi-adhesive strip on the back (3 in. x 3 in.) for easy removal and rearrangement on the cardboard timeline.

Procedure

Participants were randomly assigned to conditions and tested individually. After consent procedures, participants were seated in front of a computer screen and asked to watch the stimulus event. After watching the event, participants completed filler tasks for 15 minutes including Sudoku puzzles and the culture orientation scale. Participants were then asked to provide a detailed report about what they had witnessed during the home invasion incident.

In the timeline condition, mock witnesses used the physical timeline to structure their report of the witnessed event. Following the instructions used in Hope et al. (2013) and Kontogianni et al. (2018), they were instructed to use the Person Description cards to report any details they could remember about the people involved in the event, using a new card for each individual and multiple cards if necessary. They were instructed to use the Action cards

to report any actions or sequence information. Participants were instructed to place completed cards on the timeline in the appropriate order, place or sequence with clear links between the individual or individuals involved in each action or sequence item (i.e. “make clear who did what and when”). Participants were informed they could start their account at any point they wanted on the timeline and were free to re-order the cards as necessary to improve the accuracy of their account. In the Free Recall condition, participants were provided with an A4 booklet with blank pages in which to write their account.

Participants in both reporting conditions received the same general recall instructions requiring them to report as much detailed information as they could about the witnessed event, including detailed descriptions of the individuals involved and which actions were associated with each individual. These instructions emphasised the importance of reporting the event in the right order. Participants were also instructed to avoid guessing. No time restrictions were imposed in either reporting condition.

On completion of the recall accounts, participants were asked to respond to a set of 24 cued recall questions for details of the event. These questions targeted information about the perpetrators (e.g. What was the robber who knocked on the door wearing?), about the incident (e.g. What did the robber give the woman to put her belongings in?), about the victim (e.g. What did the victim do after the robbers left?) and about the location in which the crime took place (e.g. What was the number on the front door of the house?). These cued recall questions were carefully ordered so that any question did not give away information about a subsequent question. Again, no time limit was imposed on completion of the cued recall task.

On completion of all tasks, participants were thanked and debriefed. Test sessions took, on average, no longer than 60 mins to complete. All participants provided their account in their native language (English or Arabic).

Training and translation

A detailed protocol was developed for researchers in both locations to use when administering the experiment. Researchers at both locations (N = 3) were trained in the administration of the timeline in the following ways. First, the lead and second authors, both experienced in the training and administration of the timeline technique for research and use in practice, prepared a training video which included both an overview lecture about the timeline technique and an example demonstration of a mock participant receiving the instructions and completing an account using the timeline. This training video also included information to address frequently asked questions. The second author then delivered in-person training sessions to researchers in the UK and Lebanon to ensure equivalence in the administration of the experiment. This training incorporated multiple practice sessions, observations and detailed in-person feedback on trial sessions.

Although researchers testing participants could not be blinded to the experimental conditions given the obvious differences in reporting format, they were not informed about the specific hypotheses of the research. The researchers were trained in English (researchers at the Lebanese site were bilingual Masters-level students). All materials for use in Lebanon were translated into Arabic using a forward and back translation approach which involved the research teams at both locations translating and checking the translations to ensure parity of meaning and content in both languages.

Coding

The coding approach drew on coding practices described elsewhere in the literature for the quantification of details reported from memory (e.g. Hope, Mullis & Gabbert, 2013; Kontogianni, Hope, Vrij, Taylor & Gabbert, 2018). Recall data for the primary recall reports were initially coded for quantity and accuracy using a scoring template which classified each piece of information reported as an Action (A), Person (P), Object (O) or Setting (S) detail

e.g., Male 1 (1-P) and Male 2 (1-P) entered (1-A) the house (1-S) together. An item was deemed correct if it was present in the event and described correctly and deemed incorrect if it was present in the event but described incorrectly or was not present in the event. Each detail reported was given one point and scored as either correct or incorrect with reference to the stimulus event. Subjective responses (such as ‘‘he was ugly’’) were not coded.

A secondary coding was conducted to establish the accuracy with which actions were attributed to individual actors in the event. Person-specific action details were coded as correct when an action was correctly attributed to a specific perpetrator (e.g. “The perpetrator wearing the scarf smashed some ornaments using a baseball bat”). An incorrect response was noted when the action was attributed to the wrong perpetrator.

Sequence errors were coded by assessing whether information was reported in the wrong order. For example, if the correct sequence for what occurred was ABCD and a participant reported this information in ACBD order then C would count as a sequence error as it is the first detail reported out of sequence. Note we would not code both C and B as sequence errors in this example, only C.

Throughout the coding period, researchers at both locations were in contact regularly and worked collaboratively to resolve any queries about coding and updated the coding protocols accordingly. The cued recall questions were coded with respect to a predetermined set of responses to the questions agreed via consensus across the research team. To acknowledge where participants provided detailed responses to questions, each detail provided in response to a question was coded as per the procedure for coding details described above (hence, the number of details coded does not directly tally with the number of questions asked). The number of ‘don’t know’ responses spontaneously reported was also tallied.

An additional rater coded a random sample of 12 transcripts at each location such that, overall, 24 (25%) of recall accounts were double coded. Inter-rater reliability between the coders, using the two-way random effects model measuring consistency, was good for the main dependent variables, total correct [Single Measures ICC = 0.91, CI(0.82-0.96)] and total incorrect [Single Measures ICC = .73, CI(0.37-0.88)].

Results

Initial reports: Correct details, incorrect details, and accuracy rate

A two-way ANOVA was used to examine the effects of cultural group and report format on the total number of correct details reported in witness recall reports. There were significant main effects of both cultural group ($F(1, 114) = 39.21$, $p < .001$, $\omega^2 = .23$) and report format ($F(1, 114) = 8.09$, $p = .005$, $\omega^2 = .04$). Participants in Lebanon ($M = 51.84$, $SE = 2.54$) provided significantly fewer correct details than participants in the UK ($M = 74.50$, $SE = 2.58$) while participants in the Free Recall reporting condition ($M = 58.02$, $SE = 2.51$) reported significantly fewer details than participants in the Timeline condition ($M = 68.32$, $SE = 2.60$). However, there was a significant interaction between the effects of cultural group and report format on the total number of correct details reported, $F(1, 114) = 4.69$, $p = .03$, $\omega^2 = .02$). A review of the simple main effects indicates that participants in Lebanon did not benefit from the timeline reporting format in the same way as participants in the UK with roughly an equivalent number of details reported, regardless of reporting format (see Table 1 for descriptives).

With respect to incorrect details reported, the main effect of cultural group was not significant ($F(1, 114) = 0.01$, $p = .91$, $\omega^2 = .00$). There was a borderline significant main effect of report format ($F(1, 114) = 4.15$, $p = .044$, $\omega^2 = .026$) such that participants in the Lebanese sample reported more errors using the timeline than when providing a free recall while errors in the UK sample were roughly equivalent across report format. The interaction

was not significant, $F(1, 114) = 2.73$, $p = .10$, $\omega^2 = .01$); see Table 1).

Accuracy rate was calculated by dividing the total correct items reported by total items (correct and incorrect) reported to obtain the proportion of accurate responses. With respect to overall accuracy rate for information reported in the recall task, there was a significant main effect of cultural group on accuracy rate, $F(1, 114) = 6.13$, $p = .015$, $\omega^2 = .04$, with participants in the UK ($M = 0.93$, $SE = 0.01$) returning higher accuracy rates in their reports than participants in Lebanon ($M = 0.89$, $SE = 0.01$). The main effect of report format on accuracy rate was not significant, $F(1, 114) = 0.54$, $p = .46$, $\omega^2 = .00$. There was a borderline significant interaction between cultural group and report format on accuracy rate in the recall task, $F(1, 114) = 4.23$, $p = .042$, $\omega^2 = .026$.

Initial reports: Person-action details and sequencing

There was a significant main effect of cultural group on the reporting of correct person to action details (i.e., attributions of actions to people), $F(1, 114) = 19.95$, $p < .001$, $\omega^2 = .13$, such that participants in Lebanon reported fewer details ($M = 11.73$, $SE = .80$) than participants in the UK ($M = 17.02$, $SE = .93$). There was a borderline significant main effect of report format, $F(1, 114) = 3.96$, $p = .049$, $\omega^2 = .02$, such that participants in the free recall condition reported fewer details ($M = 13.20$, $SE = .82$) than participants in the Timeline Technique condition ($M = 15.54$, $SE = 1.02$). The interaction between cultural group and report format was not significant, $F(1, 114) = 2.79$, $p = .98$, $\omega^2 = .01$. There were no significant main effects of cultural group, $F(1, 114) = .00$, $p = .99$, $\omega^2 = .00$; or reporting format, $F(1, 114) = 1.93$, $p = .17$, $\omega^2 = .01$, on the number of incorrect person to action details reported. The interaction was not significant $F(1, 114) = 3.37$, $p = .07$, $\omega^2 = .02$.

With respect to sequencing errors, there was a significant main effect of cultural group, $F(1, 114) = 7.87$, $p = .006$, $\omega^2 = .05$, such that participants in the UK ($M = 0.33$, $SE = 0.09$) made significantly fewer sequencing errors in their accounts than participants in

Lebanon (M = 0.69, SE = 0.09). The main effect of report format was not significant (Timeline M = 0.42; Free Recall M = 0.60), $F(1, 114) = 1.95$, $p = .16$, $\omega^2 = .01$) nor was the interaction, $F(1, 114) = 3.38$, $p = .07$, $\omega^2 = .019$).

Table 1 here

Cued recall questions

A two-way ANOVA was used to examine the effects of cultural group and report format on the total number of correct details reported in response to cued recall questions. There was a significant main effect of cultural group ($F(1, 114) = 136.28$, $p < .001$, $\omega^2 = .53$). Participants in Lebanon (M = 9.25, SE = 0.33) provided significantly fewer correct details in response to cued recall questioning than participants in the UK (M = 14.81, SE = 0.34). The main effect of report format was not significant, $F(1, 114) = 0.01$, $p = .91$, $\omega^2 = .00$). However, there was a borderline significant interaction between the effects of cultural group and report format on the total number of correct details reported for cued recall questions, $F(1, 114) = 4.14$, $p = .044$, $\omega^2 = .01$; see Table 2 for descriptives.

With respect to incorrect details reported in the cued recall task, the main effect of cultural group was significant ($F(1, 114) = 61.62$, $p < .001$, $\omega^2 = .34$) with participants in Lebanon (M = 10.68; SE = 0.36) providing significantly more incorrect responses to cued recall questions than UK participants (M = 6.66; SE = 0.36). The main effect of report format was not significant ($F(1, 114) = 0.01$, $p = .92$, $\omega^2 = .00$) and the interaction was not significant, $F(1, 114) = 1.85$, $p = .18$, $\omega^2 = .005$, (see Table 2).

Finally, with respect to the number of ‘don’t know’ responses provided to cued recall questions there was a significant main effect of cultural group, ($F(1, 114) = 12.544$, $p < .001$, $\omega^2 = .09$) with UK participants providing significantly more Don’t Know responses. The

main effect of report format was not significant, ($F(1, 114) = 0.81$, $p = .37$, $\omega^2 = .00$), nor was the interaction, ($F(1, 114) = 0.04$, $p = .84$, $\omega^2 = .00$).

Table 2 here

Discussion

The aim of the research reported here was to examine and compare the accounts provided by mock witnesses drawn from two different cultural groups across two reporting formats. Consistent with previous research (e.g., Anakwah et al., 2020), mock witnesses in the UK group provided significantly more correct information overall in their reports than the Lebanese group, irrespective of the reporting format. Comparing between reporting conditions, UK participants who provided their accounts using the timeline reporting format reported significantly more information than those UK participants who simply provided a free recall of what they had seen. However, a comparable effect of reporting format was not mirrored in the Lebanese sample. Lebanese participants reported roughly the same amount of correct information, irrespective of reporting format. There were no overall differences between the cultural groups in terms of the reporting of incorrect details, although the Lebanese group made proportionally more errors in the timeline than in the free recall condition. As overall accuracy rate is a function of quantity there was a significant difference between cultural group with respect to the overall accuracy of the information provided with the UK group providing more accurate information overall. Results for the cued recall questions followed a similar pattern. Again, the UK sample provided significantly more correct information in response to the questions than the Lebanese sample. Participants in this

group also used the ‘Don’t Know’ response option more frequently and provided fewer incorrect responses to questions than Lebanese mock witnesses.

There are a number of potential explanations for the current pattern of results. First, the general patterns of ‘under-reporting’ in the Lebanese mock witness sample (cf. the UK sample) is consistent with recent findings in the eyewitness memory literature (e.g., Anakwah et al., 2020) but also broader findings in the autobiographical memory literature. As outlined in the Introduction, these differences in the recall account can be accounted for with reference to a number of theoretical positions and potentially reflect cultural differences in, among other factors, perceptual, self-construal and communication context preferences (see Wang, 2009; also Wang, 2021, for further discussion). However, given that both quantity of information reported in spontaneous accounts and quantity of information provided in response to cued recall questions was also relatively less for Lebanese participants in comparison with the UK participants, this pattern of results suggests the discrepancy may be attributable to differences in memory specificity between the groups. In other words, if differences were present between cultural groups in the initial report but not in response to the cued recall questions, then this pattern of performance may have been due to communication or social factors. Specifically, while social or communication factors might have constrained reporting in the form of a spontaneous account, even under largely self-administered written conditions, the reporting of fewer details in response to specific questions about the witnessed event may reflect a lack of memory for specific details (see Wang, 2009; also Wang, 2021, for further discussion). Of course, this is a rather speculative interpretation which should be explored in future research.

Nonetheless, findings of this nature inevitably lead to consideration of ways in which cognitive processing that benefits memory reporting might be implemented. Some research suggests that cultural differences in social orientation likely influences cultural approaches to

cognitive style (Varnum et al., 2010). Given that individuals from western cultures tend be more independent in terms of their social orientation, and to focus more on salient objects in a scene (analytic processing), while those from Eastern cultures are often more interdependent and attend more to contextual, or background features (holistic processing; Markus & Kitayama, 1991; Nisbett, Peng, Choi, & Norenzayan, 2001; Nisbett & Masuda, 2003), it may be the case that individuals from western, independent cultures allocate more attention to the specific details of focal objects, which increases the specificity of visual information for these objects in their memory (Millar et al., 2013). Interestingly, Oyserman and Lee (2008) found that a variety of social orientation priming techniques could bring about associated shifts in cognitive processing. Thus, it may be possible to alter interviewees' tendencies towards analytic or holistic processing by priming either an independent or interdependent social orientation. Future research should examine whether analytic and holistic processing styles (i) affect the level of detail reported in mock witness paradigms, and (ii) whether these processing styles might be altered through priming social orientation to shift not just encoding and subsequent processing strategies, but also reporting strategies.

Lebanese participants also provided a higher number of incorrect details as well as fewer 'don't know' responses to the cued recall questions than their UK counterparts. It is possible that factors related to the greater endorsement of power distance compelled Lebanese participants to provide more details, even if they were not confident in the accuracy of the reported information. In other words, it is possible that, in an attempt to be more informative, Lebanese participants lowered their threshold of confidence in their memory of the event when responding to specific cued recall questions, thus providing more details at the cost of accuracy (Ackerman & Goldmsith, 2008). Again, further research should explore cross-cultural differences in metacognitive monitoring in the context of witness reports, particularly responses to cued recall questions (cf., free recall).

A further aim of this research was to assess the performance of the timeline technique in comparison to a standard free recall format across two diverse cultures. The results were rather surprising. Although the findings for the UK sample were fully consistent with previous research reflecting the reporting of significantly more information in the timeline condition relative to the free report condition, the result was not replicated in the Lebanese sample. In fact, the amount of information reported in each condition by the Lebanese sample was roughly equivalent. The same pattern of results was shown for the reporting of correct attributions of actions to people involved in the event, which is another consistently replicated benefit of the timeline technique in experiments with UK participants (cf. free report). The Lebanese sample also made proportionally more reporting errors using the timeline (cf. free recall) than the UK sample, somewhat mirroring performance in the cued recall questions.

On reflection, there are several possible reasons why our Lebanese sample may not have accrued a benefit from the timeline technique given its current format and associated instructions. Research has shown that cultural background can influence the way in which people divide experiences into meaningful events (Swallow & Wang, 2020). Swallow and Wang (2020) found that US participants segmented activities into more events than Indian participants. Indian participants segmented activities into larger (coarser) units than US participants and identified event boundaries that were related to actors' goals. Conversely, US participants identified event boundaries more on the basis of changes in concrete visual features. The US participants showed a tendency toward analytic processing and scored more highly on a measure of independent orientation than Indian participants. In light of previous research indicating that Lebanese participants endorse vertical and collective self-construals more strongly than British participants (Harb & Smith, 2008), it may be that cultural orientation can account for why the Lebanese participants segmented events into coarser

units, resulting in their having less detail to report irrespective of interview format Of course, caution is necessary in the extrapolation of results observed in an entirely different cultural context (India vs. United States) to the current one. Nonetheless, it is important to consider event segmentation in relation to investigative interviewing, as the ability to segment experience into discrete events effectively leads to improved memory reporting (Sargent et al., 2013). Furthermore, Flores et al. (2017) found that instructing people to attend to event segmentation led to improved event memory. Future research should explore the potential for interview instructions relating to event segmentation to elicit more detailed and accurate memory reports.

It is important to note that despite the observed differences in recall reports, the Lebanese participants in the present study did not score significantly differently on the cultural orientation scales (with the exception of one subscale) than UK participants. Perhaps this is not entirely surprising in light of previous findings (e.g., Anakwah, 2021) and critiques emerging in the literature (e.g., Sharma, 2010) which suggest that these individual measures often fail to align with country level metrics across cultural dimensions (including Lebanon; see work by Harb and Smith, 2008). Future research should explore how often nuanced cultural differences might be measured most effectively at the individual level with respect to interaction context.

Beyond cultural factors, several methodological factors may have impacted the findings. We include detailed discussion of these factors not only to flag some limitations of the current study but also to highlight some (relevant) methodological factors for researchers to consider when conducting research of this nature. Although we went to some lengths to use samples matched in terms of age and education levels (all participants had a minimum of college level education), there may have been other differences between the groups that do not necessarily reflect relevant cultural differences. For example, although we did not

explicitly record research participation experience, we became aware that the participants in Lebanon were not familiar with taking part in experimental studies as this is not a commonplace activity at the institution at which they were recruited. In contrast, participants in the UK are often familiar with the general format and requirements of participating in psychology research and, indeed, for many psychology students it is a requirement of their studies. Nonetheless, it should be noted that both samples comprised student and community participants, so it is difficult to quantify any effect of previous participation experience. We also noted that there was a small age difference between groups (~5 years; with most participants in their 20s), however, we think it unlikely participant age played any significant role in our findings. Another issue is that although the whole research team, irrespective of location was trained extensively in the administration of the experiment by the same instructors, the data in the UK was collected by a different research team than in Lebanon; this was unavoidable due to the geographical, logistic, and linguistic location of resources. Third, although we selected a stimulus event agreed across the research team to reflect a plausible crime event in both cultures, and both groups provided accounts describing the crime event, features of the scenario may have been less familiar to the Lebanese sample. Interestingly, Anakwah et al. (2019) report similar results regarding mock-witness recall/reporting where cultural context specific stimuli were used. Fourth, beyond potential issues associated with linguistic and cross-language comparisons discussed above, we were only able to compare the Lebanese statements when translated into English with the UK statements, and not vice versa (although we did broadly observe that participants reporting in Arabic tended to produce their account from left-to-right). A fully back-translated comparison of the reports in both English and Arabic would have been preferable. Comparative work in the future may also need to take further linguistic factors into account (see Filipović, 2008; 2013). Finally, another factor that we did not consider when planning

this research is the socio-political and indeed historical context in which interactions in a law enforcement context take place and, in particular, how a request to provide a statement as a witness to a crime may be perceived (for further discussion of methodological issues in cross-cultural research, see Fischer and Poortinga, 2018).

Overall, although participants in Lebanon did not seem to spontaneously benefit from the use of the Timeline Technique relative to a free recall format with respect to increased reporting, and actually reported more errors in this format, we cannot conclude that the technique is not effective with non-Western samples. Further testing will determine whether modifications to the Timeline Technique that take into consideration existing cultural norms and organising principles of memory during encoding and/or retrieval can produce results in line with previous research. For instance, it is possible that the linear temporality implied in the timeline reporting format is not a key organisational method for high context communication cultures and, as such, a modification may be necessary with respect to the format or associated instructions. In line with theory concerning event segmentation, future research might also investigate the implementation of additional subsections on the timeline format (beyond the current 'start' and 'end' points) to cue memory across multiple event boundaries (e.g., Gold, Zacks, & Flores, 2017). Exploratory observations also revealed that while the UK sample all (100%) reported their timeline account in a left-right orientation, there was greater variation in the Lebanese sample, 57% of whom reported their account in an explicit right-left orientation. Only 11% reported in a left-right orientation and 4% worked in a top-bottom orientation. This variation may be interesting to explore in future research. Finally, it may be that in high context communication cultures, the Timeline Technique may better serve to 'ground' the focus of the interview and facilitate the interaction with the

interviewer rather than function as an individualistic self-administered task[5]. Future research should explore cultural adaptations that maximise the utility of this and other interviewing techniques across reporting contexts.

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Table 1. Means, standard errors and 95% confidence intervals for correct details, incorrect details and accuracy in recall task by report format and location.

Cultural group	Report Format	Correct Details		Incorrect Details		Accuracy Rate	
		Mean (SE)	95% CI	Mean (SE)	95% CI	Mean (SE)	95% CI
Lebanon	Timeline	53.07 (3.65)	[45.84, 60.29]	7.14 (0.75)	[5.65, 8.63]	0.89 (0.01)	[0.87. 0.91]
	Free Recall	50.61 (3.53)	[43.62, 57.60]	4.39 (0.73)	[2.95, 5.83]	0.92 (0.01)	[0.90, 0.93]
	Total	51.84 (2.54)	[46.82, 56.87]	5.73 (0.52)	[4.73, 6.79]	0.90 (0.01)	[0.89, 0.92]
UK	Timeline	83.57 (3.71)	[76.22, 90.92]	5.82 (0.76)	[4.31, 7.34]	0.93 (0.01)	[0.91, 0.95]
	Free Recall	65.43 (3.59)	[58.33, 72.54]	5.53 (0.74)	[4.07, 6.99]	0.92 (0.01)	[0.90, 0.94]
	Total	74.50 (2.58)	[69.39, 79.61]	5.68 (0.53)	[4.62, 6.73]	0.93 (0.01)	[0.91, 0.94]

Table 2. Means, standard errors and 95% confidence intervals for correct details, incorrect details and accuracy in cued recall task by report format and location.

Cultural group	Report Format	Correct Details		Incorrect Details		Don't Know	
		Mean (SE)	95% CI	Mean (SE)	95% CI	Mean (SE)	95% CI
Lebanon	Timeline	8.79 (0.48)	[7.84, 9.74]	11.00 (0.52)	[9.98, 12.02]	1.10 (0.35)	[0.42, 1.79]
	Free Recall	9.71 (0.46)	[8.79, 10.63]	10.35 (0.50)	[9.37, 11.34]	1.48 (0.34)	[0.82, 2.15]
	Total	9.25 (0.33)	[8.59, 9.91]	10.68 (0.36)	[9.97, 11.39]	1.29 (0.24)	[0.81, 1.77]
UK	Timeline	15.32 (0.49)	[14.35, 16.28]	6.28 (0.52)	[5.25, 7.33]	2.40 (0.35)	[1.69, 3.09]
	Free Recall	14.30 (0.47)	[13.36, 15.23]	7.03 (0.51)	[6.03, 8.04]	2.63 (0.34)	[1.96, 3.31)
	Total	14.81 (0.34)	[14.14, 15.48]	6.66 (0.36)	[5.94, 7.38]	2.51 (0.25)	[2.03, 2.99]