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ViMeR: a free software application to support interval-based video-mediated recall

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ABSTRACT

Video-mediated recall (VMR) procedures are used to collect time-varying data on individuals' experienced or perceived emotions, thoughts and behavior throughout a social interaction or individual task. In this article, we introduce ViMeR, a software application for the implementation of interval-based VMR. It allows individuals to report on their experiences or perceptions during (part of a) task while viewing (segments of) the videorecording of that task. Several settings of ViMeR can be easily adapted to fit the researchers' needs and aims. We illustrate the use and usability of ViMeR with data from a study in which partners from romantic couples used the software to report on their experiences during lab-based interactions. By making ViMeR freely available, we aim to facilitate the implementation of VMR procedures for researchers who want to obtain a deeper understanding of how individuals experience and perceive their social interactions and individual tasks.

1. Introduction

How individuals subjectively understand and/or perceive their social interactions and individual tasks can provide important and unique insights into both intrapersonal and interpersonal processes (Lorber, 2007; Welsh and Dickson, 2005). Video-mediated recall (VMR) is a procedure that can be used to capture individuals' own temporal emotional experiences, cognitions, and behavior, as well as those perceived in their interaction partner. VMR involves participants engaging in a videotaped interaction or individual task and subsequently rating at frequent intervals their experiences or perceptions during that task while viewing its recording. Most VMR studies focus on social interactions, although VMR has also been applied to individual tasks such as solving a puzzle. Even though VMR became easier to implement due to technical developments over time (Welsh and Dickson, 2005), software to run VMR procedures is often not freely available or not easily adaptable to individual researchers' or clinicians' needs. Here we present ViMeR, a free and open source application for the implementation of VMR.

1.1. The use of VMR

An essential tool to understand interpersonal interactions is to observe them. As emphasized in several theories, ranging from appraisal theories of emotion (e.g., Ellsworth and Scherer, 2003) to attachment theory (e.g., Bowlby, 1973; Dykas and Cassidy, 2011), not just observable behavior that can be rated by external coders, but individuals' subjective understanding of their own and interaction partner's emotions, thoughts and behavior is relevant. As mentioned above, VMR has been used to capture internal processes that are inaccessible to outside coders by letting participants (individually) report on their experiences and/or perceptions during an interaction while viewing the videorecording of that interaction. The premise is that watching the video acts as a cued recall which can enhance the accuracy of participants' ratings of their interactional experiences. Another major advantage of VMR is that it allows assessing dynamics of behavior, cognition and emotions in specific contexts, aligning with several theories emphasizing the importance of context in shaping these phenomena (e.g., Ellsworth and Scherer, 2003; Mischel and Shoda, 1995). Standard data collection on social interactions asks for global assessments after the interaction has taken place. In contrast, VMR allows reporting on brief segments (i.e., intervals spanning seconds) or in a continuous fashion, thereby enabling a fine-grained assessment of experiences and temporal sequences of interactional processes in a specific setting (i.e., related to a specific interaction).

Supporting the validity of VMR procedures, physiological measures during the actual interaction have been found to converge with

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physiological measures during the viewing of its recording, suggesting that individuals relive the interaction while watching it (Gottman and Levenson, 1985). Additionally, participants' ratings of their own and perception of their interaction partner's emotions and behavior during VMR show positive correlations with those of external raters and seem to reflect context-specific rather than global appraisals (e.g., Gottman and Levenson, 1985; Lorber, 2007; Ohr et al., 2010).

VMR has been used to examine a range of phenomena in different samples. Broadly, it can address research questions about how individuals perceive, interpret and experience social interactions and individual tasks, over time. For example, it has been used to compare interpretations of family therapy sessions between participants (Trierweiler et al., 2000), to assess individuals' ability to correctly perceive their interaction partners' feelings (in romantic partners, Verhofstadt et al., 2008; parent-child dyads, Ehrmantrout et al., 2011; and coach-athlete dyads, Lorimer and Jowett, 2009), to explore cultural differences in emotion dynamics during couple disagreement (Boiger et al., 2022), and to examine affective synchrony between interaction partners (Henry et al., 2023).

Whereas VMR is often used for rating social interactions, it can also be applied to gain understanding in intrapersonal processes taking place during individual tasks. For example, it has been used to assess children's cognitions during performing individual math and puzzle tasks (Lodge et al., 2000).

Two types of VMR procedures can broadly be distinguished: (1) continuous VMR in which participants continuously rate affect or behavior, using for instance a joystick or keyboard (e.g., Rohrbaugh et al., 2009; Sels et al., 2020); and (2) interval-based VMR in which the video is segmented into short time intervals (typically 15–30s) about which individuals report (e.g., Overall et al., 2020; Schouten et al., 2020; Verhofstadt et al., 2016). These different types of VMR procedures have different applications. Continuous VMR allows very fine-grained reporting of experienced processes, but only one- or two-variate continuous ratings can be collected at a time because of feasibility constraints. Interval-based VMR yields slightly more coarse ratings as intervals span multiple seconds, but can be used to assess more than two features at once. Moreover, diverse response formats can be incorporated (e.g., categorical choices, text input). Interval-based VMR is thus particularly well-suited for addressing research questions that require ratings of multiple features. For example, it has been used to study associations between different types of emotions and emotion suppression (Schouten et al., 2020), which requires participants to report on different types of experienced emotions and their use of emotion suppression. As another example, it has been used to examine the accuracy with which interaction partners infer their partners' thoughts as well as feelings (called empathic accuracy), which requires both partners to report on their own experienced thoughts and feelings as well as their inference of their partner's thoughts and feelings (Berlamont et al., 2022).

1.2. VMR software

The technological advances since VMR was first used (Kagan et al., 1963) have made VMR procedures more readily available to researchers (Welsh and Dickson, 2005). However, whereas openly available software for continuous coding has been developed and updated over time (e.g., DARMA, Girard and Wright, 2018; CMS, Messinger et al., 2008; JoyMon, Sadler et al., 2009), to our knowledge no such program is currently available for interval-based VMR. These continuous VMR tools do not support interval-based procedures in which predefined video segments are shown and followed by multiple questions that can take a range of response formats (e.g., categorical judgments, open-ended input). Implementing such functionality in continuous VMR tools would require substantial modification and programming expertise.

Existing software (both freely available and commercial) that can be used for interval-based coding is mostly aimed at coding by external coders and cannot easily be used by untrained participants to collect data (e.g., ELAN, Brugman and Russel, 2004; INTERACT, Mangold, 2023; Observer XT, Noldus, 2023). Looking at studies that used interval-based VMR, authors either report using software that was developed specifically for the purpose of that study and not freely available (e.g., it is owned by the university; Berlamont et al., 2022), that is outdated or does not longer run on current operating systems (e.g., De Clercq et al., 2001; Welsh and Dickson, 2005), or that is commercial, not specific for the use of VMR and requires some programming knowledge (e.g., Neurobehavioral systems' Presentation; Pauw et al., 2024). Additionally, many studies do not report whether specific software was used and if so what kind (e.g., Darling and Clarke, 2009; Overall et al., 2020). In all, what is missing to facilitate implementation of interval-based VMR is a freely available application that can be modified without specific programming skills and used by coders (e.g., participants and trained coders) without extensive training. Therefore, we developed ViMeR, a free and open source application for the easy implementation of interval-based VMR. Unlike existing software for interval-based coding (e.g., ELAN, Observer XT), ViMeR combines interval-based coding with participant-friendly workflows, minimal training requirements, open-source customization, and free availability making it a flexible and widely useable tool.

2. Overview and tutorial of ViMeR

Below we give an overview of ViMeR describing its features at time of publication of this article (version 0.1.1). An up-to-date explanation and version of the app can be found on https://ppw-okpiv.pages.gitlab.kuleuven.be/research/vimer. ViMeR is a stand-alone program that runs on a computer (operating system Windows or Mac). Using the app does not require an internet connection. ViMeR is designed for performing interval-based VMR of already available recordings of interactions or tasks: it allows to load a video and play one video segment at a time, after which questions about the segment are displayed next to the video (see Fig. 1). The app has limited system requirements, but its performance depends on the device's ability to play the video files: if a video plays without issues, ViMeR should function correctly even on low-end or older machines. All instructions and text shown to coders can be adjusted so the app can be used in any left to right written language that makes use of the Latin alphabet. Below we describe (1) how the researcher can customize the configuration of the application and survey shown to the participant to fit one's research question, (2) how to start a ViMeR session for data collection, and (3) the output generated by ViMeR.

2.1. Setting up the configuration file

Multiple settings can be customized in the configuration file of the app. Fig. 2 shows part of an example configuration file. The configuration file is in YAML format. A base configuration file, as well as an up-to-date overview and in-depth explanation of settings, can be found in the online documentation (https://ppw-okpiv.pages.gitlab.kuleuven.be/research/vimer). Below we describe the settings available in version 0.1.1. The configuration file contains four sections: (1) general; (2) instructions; (3) outro; (4) survey.

2.1.1. General

Timing. The timing setting determines how the video is divided into intervals. There are two types of timing: (1) absolute: the video is stopped every x seconds; or (2) relative: the video is divided into x segments of equal length. The user can choose the interval duration in seconds (in case of absolute timing) or the number of segments (in case of relative timing). Note that in case of absolute timing only intervals that last the selected duration are included, meaning that selecting an absolute interval of 30 s for a video of 5 min and 20 s results in the final 20 s not being shown to participants.

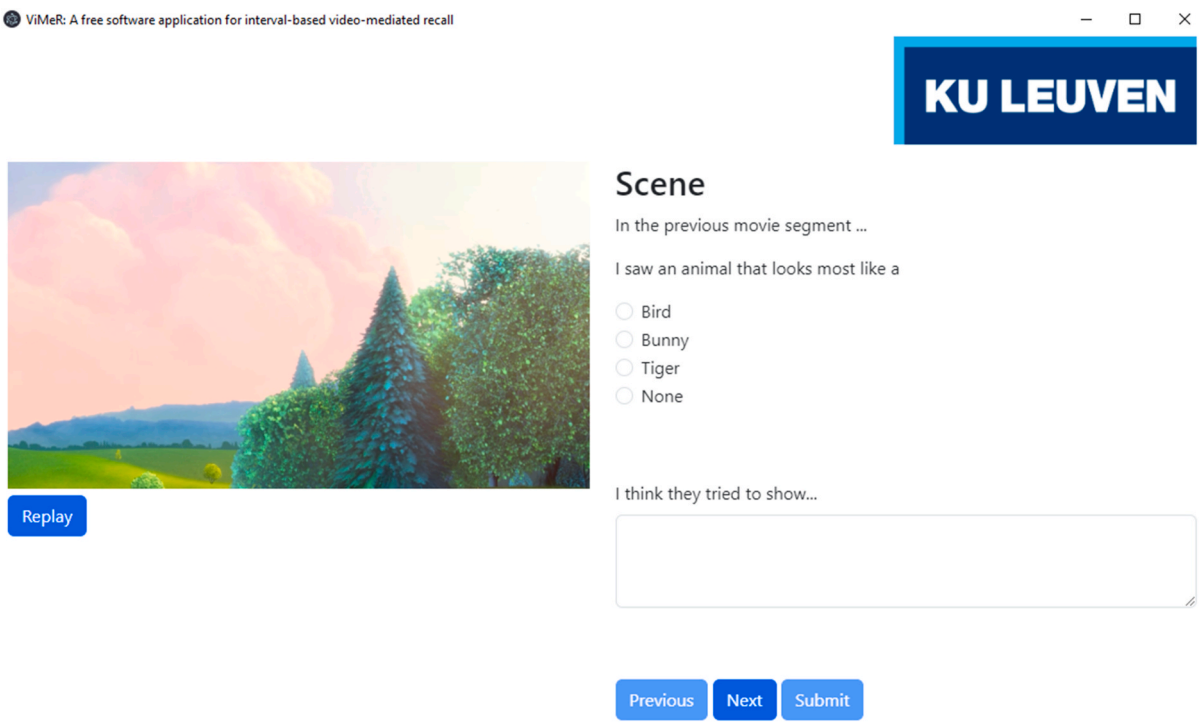

Fig. 1. Example of a survey page in ViMeR.

Labels. Here the text displayed on the buttons with which coders navigate through the app during VMR can be adjusted.

User Interface (UI). Here one can enable/disable showing the 'Replay' button, which allows participants to replay a video fragment ('showReplayButton'), and 'Previous' button, which allows participants to go to a previous page with questions ('showPreviousButton'). Moreover, the ratio in which the video and questions are displayed on the screen can be adjusted ('videoWidth'). Finally, one can customize the app by selecting an image here, for example a university logo, that is shown to participants in the upper right corner of the app ('image'; see Fig. 1 where a logo from KU Leuven is displayed).

2.1.2. Instructions

Here the instructions shown to the coder at the start of the VMR are specified.

2.1.3. Outro

Under 'Outro' a message can be added that is shown to participants after they have completed the VMR task.

2.1.4. Survey

The settings under 'survey' determine the questions that are asked to participants following each video fragment. The survey questions can be displayed on one page or be divided over multiple pages. For every page of questions one can indicate a title and description. For each question, one can specify the actual 'question', the 'label' (the question title that appears in the output), the response 'type', and related specific 'options' that differ per response type. Currently (version 0.1.1), five response types are available: (1) slider scale, (2) likert scale, (3) text, (4) radio button (one-answer), and (5) grid. Under 'options' the user can edit the answer choices. For slider and likert scale questions, for example, one can set the labels accompanying the answer scale, the values that make up the scale, and whether scale values are shown to the participants. A complete and up-to-date overview of answer options can be found in the online documentation.

2.2. Starting a ViMeR session to collect data

When participants are ready to do the VMR (i.e., after the interaction/task has been videotaped), the researcher can launch ViMeR. Fig. 3 shows its setup screen. Here, the researcher can enter a name or code, which allows the output data to be pseudonymized in order to protect participants' privacy. In addition, the video file to be coded by the participant and the settings file, i.e., the configuration file, to be used are selected here. After a video file is selected, a video preview is displayed on the left side of the screen. Finally, the researcher indicates where to save the output, i.e., the participants' answers. All output files are saved to the folder specified by the researcher, and videos are read from locations selected by the researcher. The security of the data therefore depends on the storage system used, rather than the app itself. Researchers can adjust the level of data protection according to the sensitivity of the information being collected.

2.3. Understanding the output

After the ViMeR session has ended, the output can be found in the selected folder. The output file name contains the participant code, the name of the configuration file, and the file name of the video. Thus, a separate output file is generated for every ViMeR session. The data is automatically saved each time the participants submit their answers following a video fragment. The output is in.csv format. The first row of the datafile is the header. Below the header, each row represents a different video segment. The first four columns contain information about the ViMeR session, i.e., the participant code ('participantcode'), the timestamp of the response (i.e., the date and time when the participant submitted the answers; 'responseTimestamp'), the timepoint in the video (in seconds) at which the segment started ('segmentStartTimestamp'), and the timepoint in the video at which the segment ended ('segmentEndTimestamp'). The next columns display the answers of the participant to the survey questions. These columns are headed with the question labels that were specified in the configuration file.

```yaml
general:
  timing:
    type: relative
    interval: 2
    segments: 5
  labels:
    previous: Previous
    next: Next
    submit: Submit
    play: Play
    replay: Replay
  ui:
    showReplayButton: true
    showPreviousButton: true
    videoWidth: 50
    image: assets/kuleuven.png

instructions:
  title: Instructions
  text: A short introduction video about big buck bunny will be shown. Please pay attention to everything you see

outro:
  title: Thanks for participating
  text: Please go to the experiment instructors. They will guide you to the next part of this experiment.

survey:
- page: Scene
  description: In the previous movie segment ...
  questions:
  - question: I saw an animal that looks most like a
    label: scene_animal
    type: radio
    options:
      - Bird
      - Bunny
      - Tiger
      - None
  - question: I think they tried to show...
    label: scene_situation
    type: text
```

Fig. 2. Example configuration file for ViMeR.

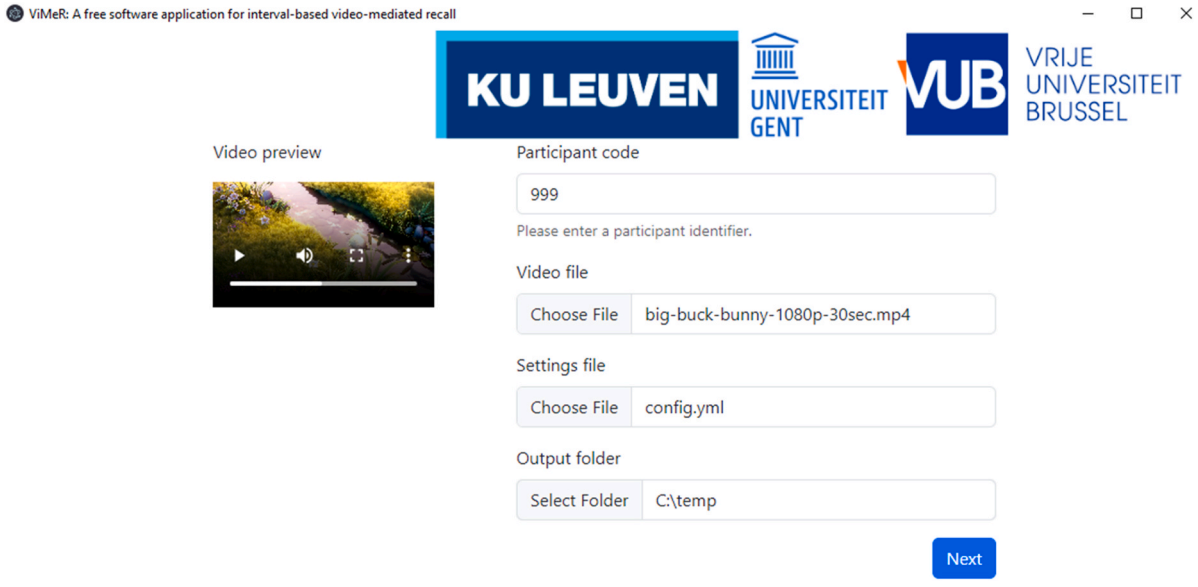

Fig. 3. ViMeR setup screen.

3. Usability evaluation of ViMeR

Here we aimed to evaluate the usability of ViMeR as a software tool to implement the VMR method (note that the validity of the VMR method itself has been supported by previous research; e.g., Gottman and Levenson, 1985; Lorber, 2007). ViMeR is currently being used in

studies of KU Leuven and Vrije Universiteit Brussel. Researchers involved in these studies were able to independently program and use ViMeR in service of their research questions. These studies focus on emotion dynamics in leader-follower dyads and romantic couples during negative and positive interactions, by having dyad members rate their own and interaction partner's emotions and behavior every 30 s using grid, scale, and text questions. For instance, Fig. 4 displays ratings of positive affect, negative affect and emotion suppression of two romantic partners over the course of a mutual 8-min interaction. The interaction was videotaped, and afterwards the partners rewatched the interactions and rated, among others, their positive and negative affect and use of emotion suppression during 30 s intervals using ViMeR. Such data could be used to answer the question whether one partner's own emotion suppression is related to their own (or their partner's) experienced positive or negative affect. The figure displays how ViMeR is capable of collecting data regarding multiple features of interest throughout an interaction.

We also evaluated users' experiences with ViMeR. To this end, we interviewed 20 participants (partners from romantic couples) from a study in which ViMeR was used. The interview focused on their experience with the program and was administered shortly after they had used it, at the end of a session in the lab. Participants were on average 30.26 years old (SD = 7.44) and had been in a romantic relationship for an average of 7.20 years (SD = 5.66). The sample included 17 Belgian and two Dutch participants (demographics missing for one participant). In terms of education, one participant had completed primary school, five had completed high school, eight held a bachelor's degree, and five held a master's degree. The interview consisted of four open questions about general experience of the app, ease of use, intuitiveness of features, and usefulness for reflecting on the conversation. Responses were recorded in free text. Not all participants answered every question. Answers were reviewed and summarized by the research team to identify overall valence (positive, neutral, negative), whether the software helped participants reflect on the conversation, and recurring themes for potential improvements. Nineteen participants (95 %) were overall positive about ViMeR. These participants indicated that ViMeR was clear, intuitive and easy to use. One person (5 %) was neutral about ViMeR, mentioning that it was not necessarily easier or harder to use than other software. Additionally, most participants (13; 65 %) stated that the software had helped them reflect on the conversation with their partner, whereas two participants (10 %) stated it did not necessarily help them reflect. Some participants also suggested potential

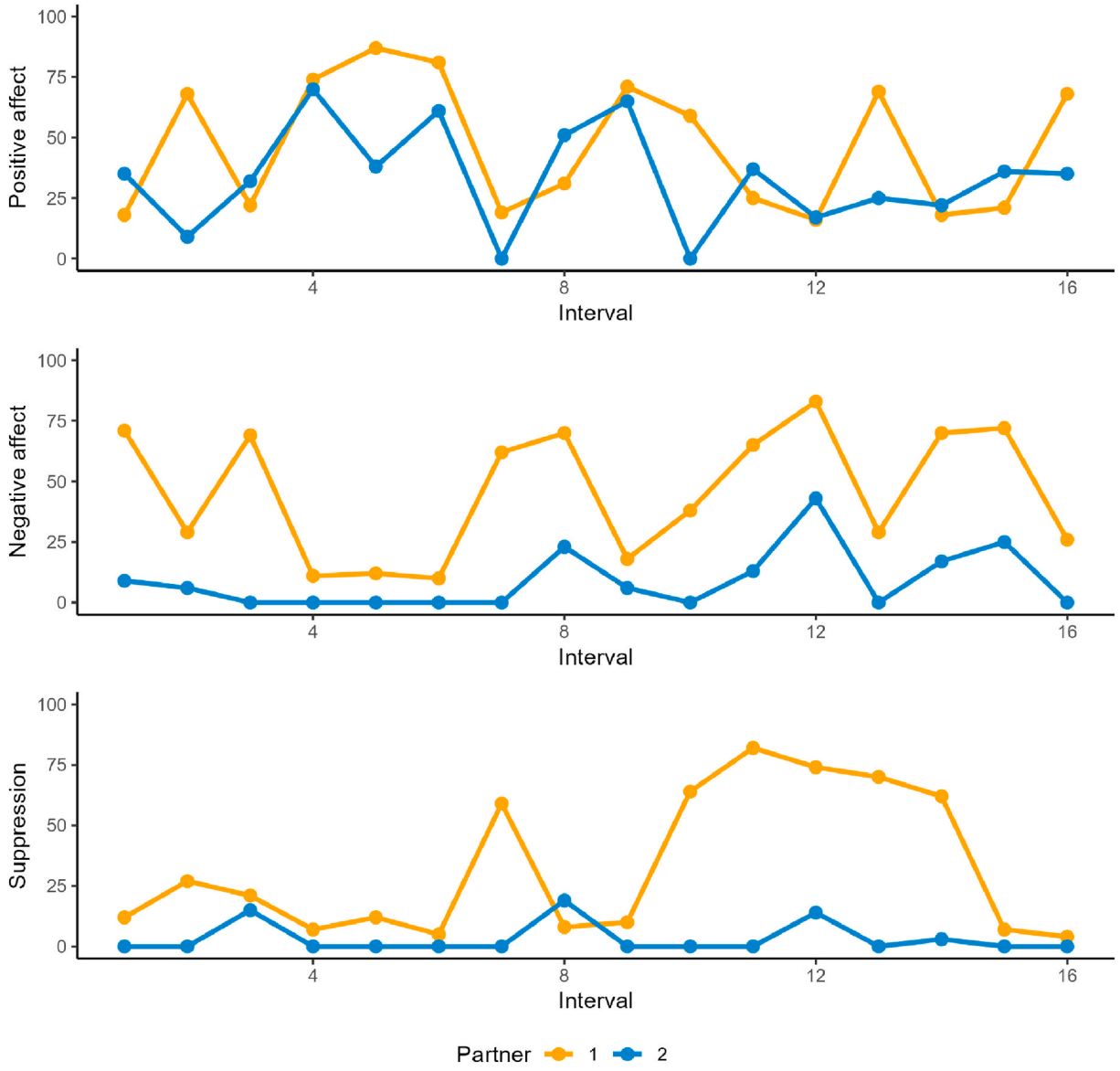

Fig. 4. Illustration of data collected with ViMeR.

improvements. Most of these suggestions were related to specific choices by the researchers in this particular data collection, which can be changed in the configuration file (e.g., the 'Replay' button was disabled in the study and participants indicated they would have liked to have the option to replay the video fragments). Finally, some users commented that the slider scales were rather small and it was confusing that a 'Submit' button was visible but disabled on all question pages except for the last one. These issues have been addressed in version 0.1.1. of ViMeR. In summary, the majority of participants reported positive experiences with ViMeR. However, it should be noted that the usability evaluation involved a relatively small sample, and findings may not generalize to all potential users.

4. Conclusion

VMR procedures allow collecting time-varying data on individuals' subjective experience, perceptions, and understanding of videotaped interactions and individual tasks. Here we introduced ViMeR, an interval-based VMR application that can be adapted to one's needs without requiring specific programming skills. Compared to existing VMR-capable tools, ViMeR uniquely combines free availability, open-source flexibility, ease of use, and adaptability, making it readily useable for both researchers and participants. As an open-source application, ViMeR also provides opportunities for future enhancements, such as broader language support, more flexible survey logic, and additional output options, allowing the tool to evolve to meet diverse research needs. With ViMeR, we aim to ease the implementation of VMR procedures into research and clinical practice to facilitate a better understanding of interpersonal as well as intrapersonal processes.

CRediT authorship contribution statement

Kristof Meers: Writing – review & editing, Visualization, Software, Conceptualization. **Martine W.F.T. Verhees:** Writing – original draft, Software, Investigation, Conceptualization. **Peter Kuppens:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization. **Otto Versyp:** Writing – review & editing, Visualization, Investigation, Formal analysis, Data curation. **Eva Ceulemans:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization.

Open practices statement

The ViMeR application as well as its code is available via https://gitlab.kuleuven.be/ppw-okpiv/research/vimer

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

References

Berlamont, L., Sels, L., Ickes, W., Ceulemans, E., Hinnekens, C., Verhofstadt, L., 2022. Associations between affect and empathic accuracy during conflict interactions in couples. J. Soc. Pers. Relat. 39 (7), 2239–2261. https://doi.org/10.1177/02654075221076453.

Boiger, M., Kirchner-Häusler, A., Schouten, A., Uchida, Y., Mesquita, B., 2022. Different bumps in the road: the emotional dynamics of couple disagreements in Belgium and Japan. Emotion 22 (5), 805–819. https://doi.org/10.1037/emo0000910.

Bowlby, J., 1973. Attachment and Loss, 2. Basic Books, New York, NY. *Separation*.

Brugman, H., Russel, A., 2004. Annotating multimedia/multi-modal resources with ELAN. Proceedings of the 4th International Conference on Language Resources and Language Evaluation (LREC), pp. 2065–2068.

Darling, N., Clarke, S.A., 2009. Seeing the partner: a video recall study of emotional behavior in same- and mixed-sex late adolescent romantic couples. J. Youth Adolesc. 38 (7), 1015–1026. https://doi.org/10.1007/s10964-009-9407-y.

De Clercq, A., Buysse, A., Roeyers, H., Ickes, W., Ponnet, K., Verhofstadt, L., 2001. VIDANN: a video annotation system. Behav. Res. Methods Instrum. Comput. 33 (2), 159–166. https://doi.org/10.3758/BF03195361.

Dykas, M.J., Cassidy, J., 2011. Attachment and the processing of social information across the life span: theory and evidence. Psychol. Bull. 137, 19–46. https://doi.org/10.1037/a0021367.

Ehrmantrout, N., Allen, N.B., Leve, C., Davis, B., Sheeber, L., 2011. Adolescent recognition of parental affect: influence of depressive symptoms. J. Abnorm. Psychol. 120 (3), 628–634. https://doi.org/10.1037/a0022500.

Ellsworth, P.C., Scherer, K.R., 2003. Appraisal processes in emotion. In: Davidson, R.J., Scherer, K.R., Goldsmith, H.H. (Eds.), Handbook of Affective Sciences. Oxford University Press.

Girard, J.M., Wright, A.G.C., 2018. DARMA: software for dual axis rating and media annotation. Behav. Res. Methods 50 (3), 902–909. https://doi.org/10.3758/s13428-017-0915-5.

Gottman, J.M., Levenson, R.W., 1985. A valid procedure for obtaining self-report of affect in marital interaction. J. Consult. Clin. Psychol. 53 (2), 151–160. https://doi.org/10.1037/0022-006X.53.2.151.

Henry, L.M., Watson, K.H., Cole, D.A., Torres, S., Vreeland, A., Siciliano, R.E., Anderson, A.S., Gruhn, M.A., Ciriegio, A., Broll, C., Ebert, J., Kuhn, T., Compas, B.E., 2023. Mean-level correspondence and moment-to-moment synchrony in adolescent and parent affect: exploring associations with adolescent age and internalizing and externalizing symptoms. Dev. Psychopathol. 35 (2), 809–822. https://doi.org/10.1017/S0954579422000062.

Kagan, N., Krathwohl, D.R., Miller, R., 1963. Stimulated recall in therapy using video tape: a case study. J. Counsel. Psychol. 10 (3), 237–243. https://doi.org/10.1037/h0045497.

Lodge, J., Tripp, G., Harte, D.K., 2000. Think-aloud, thought-listing, and video-mediated recall procedures in the assessment of children's self-talk. Cognit. Ther. Res. 24 (4), 399–418. https://doi.org/10.1023/A:1005575618941.

Lorber, M.F., 2007. Validity of video-mediated recall procedures for mothers' emotion and child ratings. J. Fam. Psychol. 21 (3), 520–528. https://doi.org/10.1037/0893-3200.21.3.520.

Lorimer, R., Jowett, S., 2009. Empathic accuracy, meta-perspective, and satisfaction in the coach-athlete relationship. J. Appl. Sport Psychol. 21 (2), 201–212. https://doi.org/10.1080/10413200902777289.

Mangold, 2023. Interact: the software for video-based research. https://www.mangold-international.com/en/products/software/behavior-research-with-mangold-interact.html.

Messinger, D.S., Cassel, T.D., Acosta, S.I., Ambadar, Z., Cohn, J.F., 2008. Infant smiling dynamics and perceived positive emotion. J. Nonverbal Behav. 32 (3), 133–155. https://doi.org/10.1007/s10919-008-0048-8.

Mischel, W., Shoda, Y., 1995. A cognitive-affective system theory of personality: reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. Psychol. Rev. 102 (2), 246. https://doi.org/10.1037/0033-295X.102.2.246.

Noldus, 2023. The observer XT. https://www.noldus.com/observer-xt.

Ohr, P.S., Vidair, H.B., Gunlicks-Stoessel, M., Grove, A.B., Lima, C. La., 2010. Maternal mood, video-mediated cognitions, and daily stress during home-based, family interactions. J. Fam. Psychol. 24 (5), 625–634. https://doi.org/10.1037/a0021007.

Overall, N.C., Clark, M.S., Fletcher, G.J.O., Peters, B.J., Chang, V.T., 2020. Does expressing emotions enhance perceptual accuracy of negative emotions during relationship interactions? Emotion 20 (3), 353–3677. https://doi.org/10.1037/emo0000653.

Pauw, L., Sauter, D., van Kleef, G., Sels, L., Fischer, A., 2024. The dynamics of interpersonal emotion regulation: how sharers elicit desired (but not necessarily helpful) support. Emotion. https://doi.org/10.1037/emo0001382.

Rohrbaugh, M.J., Shoham, V., Butler, E.A., Hasler, B.P., Berman, J.S., 2009. Affective synchrony in dual- and single-smoker couples: further evidence of "symptom-system fit". Fam. Process 48 (1), 55–67. https://doi.org/10.1111/j.1545-5300.2009.01267.x.

Sadler, P., Ethier, N., Gunn, G.R., Duong, D., Woody, E., 2009. Are we on the same wavelength? Interpersonal complementarity as shared cyclical patterns during interactions. J. Personality Soc. Psychol. 97 (6), 1005–1020. https://doi.org/10.1037/a0016232.

Schouten, A., Boiger, M., Kirchner-Häusler, A., Uchida, Y., Mesquita, B., 2020. Cultural differences in emotion suppression in Belgian and Japanese couples: a social functional model. Front. Psychol. 11 (May), 1–12. https://doi.org/10.3389/fpsyg.2020.01048.

Sels, L., Cabrieto, J., Butler, E., Reis, H., Ceulemans, E., Kuppens, P., 2020. The occurrence and correlates of emotional interdependence in romantic relationships. J. Personality Soc. Psychol. 119, 136–158. https://doi.org/10.1037/pspi0000212.

Trierweiler, S.J., Nagata, D.K., Banks, J.V., 2000. The structure of interpretations in family therapy: a video-enhanced exploration. Fam. Process 39 (2), 189–205. https://doi.org/10.1111/j.1545-5300.2000.39204.x.

Verhofstadt, L.L., Buysse, A., Ickes, W., Davis, M., Devoldre, I., 2008. Support provision in marriage: the role of emotional similarity and empathic accuracy. Emotion 8 (6), 792–802. https://doi.org/10.1037/a0013976.

Verhofstadt, L.L., Devoldre, I., Buysse, A., Stevens, M., Hinnekens, C., Ickes, W., Davis, M., 2016. The role of cognitive and affective empathy in spouses' support interactions: an observational study. PLoS One 11 (2), 1–18. https://doi.org/10.1371/journal.pone.0149944.

Welsh, D.P., Dickson, J.W., 2005. Video-recall procedures for examining subjective understanding in observational data. J. Fam. Psychol. 19 (1), 62–71. https://doi.org/10.1037/0893-3200.19.1.62.