



# Coding Video Data, Audio Data, and Images

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The tremendous technical progress made in recent years means that we can now take amazingly high-quality photos and video recordings with commercially available smartphones. And this, in turn, has opened up new opportunities for empirical research and the areas of field research and educational research in particular. Now virtually all researchers can produce high-quality video recordings in the field—at no cost. Consequently, there has also been a steadily growing need to be able to analyze this type of data material scientifically and to treat it in a similar methodological manner to interview or focus groups. As a method of data collection, video has of course led to great progress, especially for research into nonverbal behavior. In contrast to previous logging of observations, it is now possible to watch scenes repeatedly and have them coded by several people at different times, which significantly improves the quality of the analysis. In addition to working with videos, this chapter will also cover how to code and analyze still images, such as photos and screenshots of web pages.

## In This Chapter

- Getting to know the key characteristics of video analysis
- Answering the question, “Start coding immediately or transcribe first?”
- Using the “Multimedia Browser” in MAXQDA
- Direct coding of videos and adding memos and links
- Exporting still images for publications and inserting them as new image documents
- Customizing the display of images and coding image sections

## Characteristics of Video Analysis

Video data can be analyzed in a wide variety of ways. In sports and movement science, for example, it is important to study movement sequences very precisely (and very slowly) and, in the case of competitive sport, to improve them. You might have taken a skiing course, for instance, in which your skiing was filmed and then watched back with the whole group—sometimes in slow motion. Perhaps you were rather impressed with your skiing style, then again, perhaps not so much. “Video analysis” is also an innovative field in the area of “artificial intelligence,” where the aim is to automatically recognize temporal and spatial events, for example, objects, movements, and situations. This plays a key role in the surveillance of public space. In the social and educational sciences, video technology has been used in research for several decades, especially to record interactions and learning situations in classroom research. The analysis technique used often involves coding the material, whereby the methods—not dissimilar to those used for the analysis of texts—differ according to whether they tend to be more content-analytical and category-based (z. Rose, 2000) or more oriented toward interpretation and hermeneutic analysis (e.g., Knoblauch, Soeffner, Raab, & Schnettler, 2012).

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## Coding Video Data Directly or Transcribing First?

When working with videos, the question arises whether you should first transcribe them as you would for audio recordings (Heath, Hindmarsh, & Luff, 2010) or whether you should begin coding them immediately. At first, it may seem tempting to skip the transcription process and start coding the video straight away. Transcription involves a lot of work, and it can feel like a rather tedious exercise with little of the exciting “research adventure” to it. On the other hand, experience suggests that in the case of interviews, for example, it is much easier to find your way around written data. You can search for words or specific topics in the transcript, meaning that sections of text that take several minutes to relate verbally can be coded very quickly. In individual cases, therefore, it is worth considering whether the written form is preferable. You are most likely to forgo transcribing a video if you are primarily interested in interactions, paraverbal communication, body language, and the like. The more the spoken language plays a role in the analysis, the more advisable it is for the video data to be written down or at least partially written down. It should also be noted that any transcription automatically involves a loss of information and constitutes an interpretation of the data. This should be clear in the case of video data where the wealth of information captured goes far beyond any text version. While it is not unusual in audio recordings—for example, for open question style interviews or focus group discussions—to continue working only with the transcript and not the original recording, for most video recordings the images are also analyzed and at least partially coded in addition to the text. MAXQDA allows you to work with a combination of text and images in your analysis work, so it is

certainly possible to directly code some parts of a video and then transcribe and code the transcript of other parts.

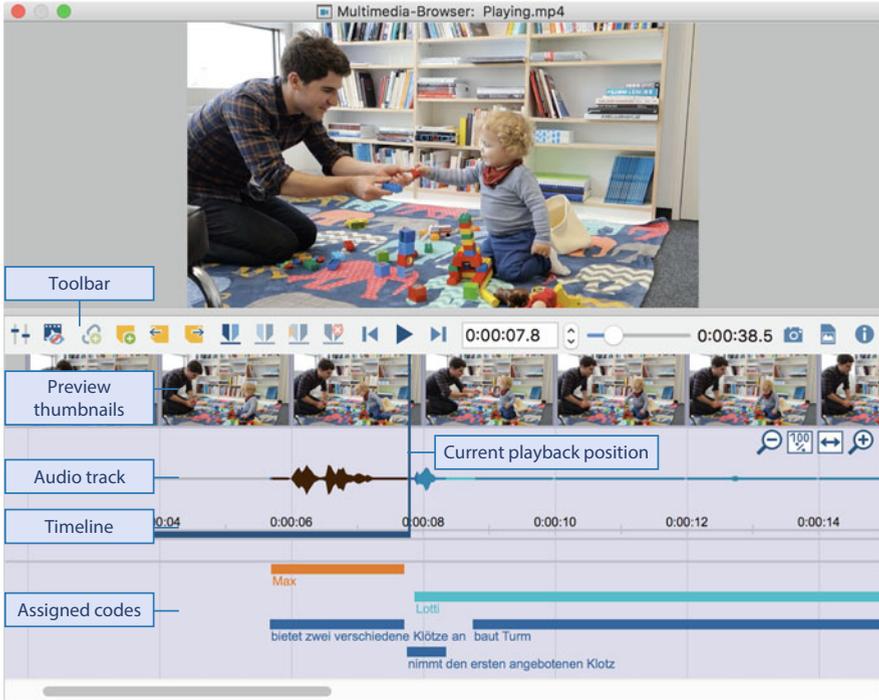
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## Coding Video Data in the “Multimedia Browser”

As described in Chap. 3, video files are not displayed and played back in the “Document Browser” like other documents, but in the separate “Multimedia Browser” (Fig. 7.1). The video is played in the upper window of the browser. Directly below, there is a toolbar that contains all the playback functions as well as tools for coding it.

All the important steps for coding and working with videos can be performed using the icons in the toolbar or by using their corresponding keyboard shortcuts:

- To play and pause the video, use the *Play/Pause* icon or the **F4** or **F5** keys, or, with the “Multimedia Browser” currently in focus, press the *Space bar*. In addition, pressing the **Ctrl** key twice (Windows) or **Shift** ⌘ key (Mac) also starts and pauses playback.
  - The blue vertical stripe at the bottom of the window displays the current playback position, and the corresponding time is shown in the toolbar. The slider in the toolbar is useful for navigating quickly in a long video. Use the fast-forward and rewind icons or the **F12** and ⌘+**F12** keys to jump forward and backward in 5-second increments for navigating to nearby scenes.
  - Preview images below the toolbar will help you navigate within a video file that contains different scenes (they are less helpful in the case of an interview because they all look very similar). These images can be displayed or hidden using the second icon from the left. The first time they are displayed, you can determine the time interval between them as well as their size.
  - In the *control panel*, which you can access via the first icon on the far left, the volume can be reduced for loud recordings and increased for quiet recordings, and you can also adjust the playback speed here.
- **Please Note** On a Mac, function keys **F1** through **F12** are usually assigned system-specific functions. To use them for transcription in MAXQDA, press and hold the **fn** key at the same time. Since this can be very cumbersome, you may want to open the system settings and select the setting **Use F1, F2 etc. as standard function keys** in the “Keyboard” menu. Then it will no longer be necessary to press and hold the **fn** key. On some Windows computers, the function keys are also assigned to system functions. In this case, it may be helpful to conduct an Internet search as to how the function keys on your computer can be used without holding the **fn** key.



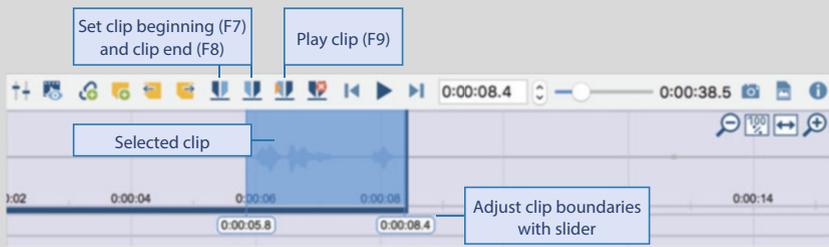
**Fig. 7.1** The “Multimedia Browser” for working with video files

In the lower area of the “Multimedia Browser,” the audio track is displayed as a waveform parallel to the video timeline. The higher the volume at a point in the video, the higher the peaks in the waveform. The waveform will predominantly help you navigate through individual scenes, since there are little gaps or dips in it for pauses in speech. The four icons in the top right corner of the waveform window control how much of the video timeline is displayed, i.e., the visible time span in the window. A short time range is suitable for detailed analyses and for coding short scenes, while zooming out is useful for working with longer video sequences.

The procedure for coding parts of a video file in MAXQDA corresponds to the procedure for coding texts: select a segment of the video (Box 7.1) and assign an existing or a new code to it. A selected video segment is often referred to as a “clip.”

**Box 7.1: Selecting a Clip in the “Multimedia Browser”**

- Start the playback of the video recording, e.g., by pressing the **F4** key, and stop it exactly at the point from which you want to assign a code.
- Then click the **Start of clip selection** icon or press the **F7** key.
- Now restart playback and stop at the end of sequence you want to code. Click the **End of clip selection** icon or the **F8** key.
- The borders of the clip can be easily changed by moving the boundaries of the blue frame in the waveform display, or the time indicator directly beneath these boundaries, with your mouse (Fig. 7.2). When you click on a clip boundary, you can use the arrow keys ← and → on the keyboard to adjust the clip to within a tenth of a second.
- To check your selected clip, you can play it by clicking on the blue area or pressing the **F9** key.



You can also select a clip in the waveform itself by drawing a horizontal area across it, keeping your left mouse button pressed down. The peaks and troughs in the audio track’s waveform and the video images that accompany your mouse movement will help you navigate through the video.

Your selection can then be coded in MAXQDA as usual, e.g., by dragging and dropping the selection onto a code. When you right-click on the selection, three alternative coding options will appear in the context menu: (1) code with a new code, (2) code with “the most recently used code,” and (3) code with activated codes. You can also use the predefined keyboard shortcuts, such as **Alt+W**



**Fig. 7.2** Coding stripes in the “Multimedia Browser”

(Windows) or  $\text{⌘} + \text{⌘} + \text{W}$  (Mac), for assigning a new code, as well as your own user-defined keyboard shortcuts, to code within the “Multimedia Browser.”

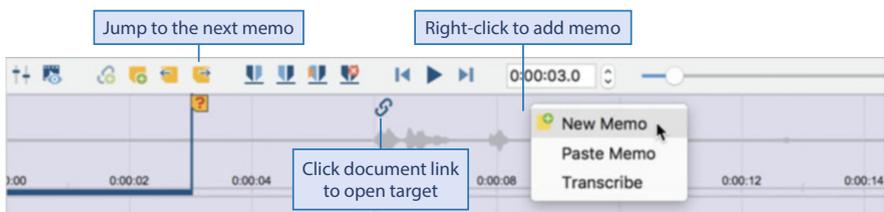
### How Codes Are Displayed in the “Multimedia Browser”

Assigned codes are indicated by coding stripes below the timeline; the code name is always displayed below its stripe. In addition, the audio track is highlighted with the corresponding color of the code in the corresponding time range. If several assigned codes overlap in the video, a mixed color is displayed in the waveform. Clicking on the coding stripe once will select the corresponding time range in the waveform; a double-click plays the clip. Right-click on the coding stripe to see further options for adding a weight or code comment to the clip or deleting the assignment of the code to this section of the video.

Just as the display of the coding stripes can be configured in the “Document Browser,” you can also specify which code assignments you want visually displayed in the “Multimedia Browser.” To do this, right-click in the area in which the coding stripes are displayed. In the dialog box that opens, you can restrict the display of assigned codes by color or according to the user who assigned them. The option *Fixate code favorites at the top* will display the coding stripes of the codes listed under *Codes > Code Favorites* at the top of the “Multimedia Browser,” each in its own row. This option is particularly suited to working with codes intended to break down and structure a video or to identify different camera settings. The assigned codes then facilitate easy navigation through the video and can be used for correlation analyses that track questions such as “Which interactions take place in which teaching phase?”.

## Attaching Memos to Video Files and Linking Video Clips

Memos can perform a variety of functions in video analyses. They can be used to identify relevant points or sequences in the video, to make notes of interpretations of selected scenes, and they can also be used to structure the video material. To assign a memo to the current playback position (Fig. 7.3), click the *New memo* icon in the “Multimedia Browser” toolbar or, alternatively, use the  $\text{Alt} + \text{⌘} + \text{M}$  (Windows) or  $\text{⌘} + \text{⌘} + \text{M}$  (Mac) shortcut keys. If you right-click a point in the audio track, a memo is added at that position. The memo can be moved up and



**Fig. 7.3** Add a new memo to the playback position

down as well as to the right and left by dragging and dropping it with the mouse. As you move the memo, the video image will run along with it, so you can place it exactly where you want it. If you have used memos to structure the material, the icons *Next memo (F3)* and *Previous memo (⇧+F3)* in the “Multimedia Browser” toolbar will help you to navigate within the video file.

In MAXQDA, document links can be used to connect two places of the data material to each other and to jump quickly from one location to another (you can find further details on working with document links in Chap. 5). These locations may be in the same document or in different documents. You can also set document links in videos open in the “Multimedia Browser,” which either lead to another place in the same video, a separate video or—as will almost certainly be the case more often—to a section of text. Suppose you watched some video sequences with students studying to be teachers and then transcribed their discussions about the videos. You can then use a document link to connect a student’s statement in the transcript about a particular event to that scene in the video. To do this, select a location in the transcript, right-click on this selection, and choose the entry *Insert Document Link*. This will set a link anchor at that location. Then, in the second step, select a clip in the video and follow the same procedure: right-click on the selection and choose the same entry in the context menu to set the target of the link. Alternatively, you can also link two locations using the *Set link anchor/target* icon, which is available in both the “Multimedia Browser” and the “Document Browser.”

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## Creating Still Images and Integrating Them in Publications

Videos can only be added to research reports to a limited extent; this is often prohibited not only by data protection regulations but also by practical concerns. These days you can certainly make videos or excerpts of videos available online and reference their respective web page in reports. However, only limited reference can be made to such external links in publications. For this reason, still images are frequently used to illustrate the results of video analyses. MAXQDA lets you copy a currently displayed video image to your clipboard and then paste it directly into a publication. To do this, click the *Copy video image to clipboard* icon in the “Multimedia Browser” menu. Additionally, the function *Insert video image as a document in “Document System”* inserts the currently displayed image at the top of your document list. From here you can analyze this image further, for example, by coding and commenting on parts of it. The options MAXQDA offers for coding images are described in detail in section “Coding and Analyzing Images”.

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## Coding Audio Data in the “Multimedia Browser”

Audio data is coded in the same way as video data. Simply open the audio file in the “Multimedia Browser” and you will have all the tools you need to code it, annotate it with memos, and link points in the recording to each other or other places in your

data, at your disposal. The only difference to analyzing video data is, of course, that there are no still images or preview thumbnails available. Accordingly, the coding and analysis of audio data has a completely different objective to that of video data analysis. Transcriptions, including partial transcriptions of recordings, usually play a far greater role in the analysis of audio data. The analysis of the audio track itself is particularly useful if you want to go beyond the analysis of its content and consider, for example, an interview respondent's speech or whether they are nervous or not. The transcription and the relevant points in the audio recording can then be connected using document links or timestamps.

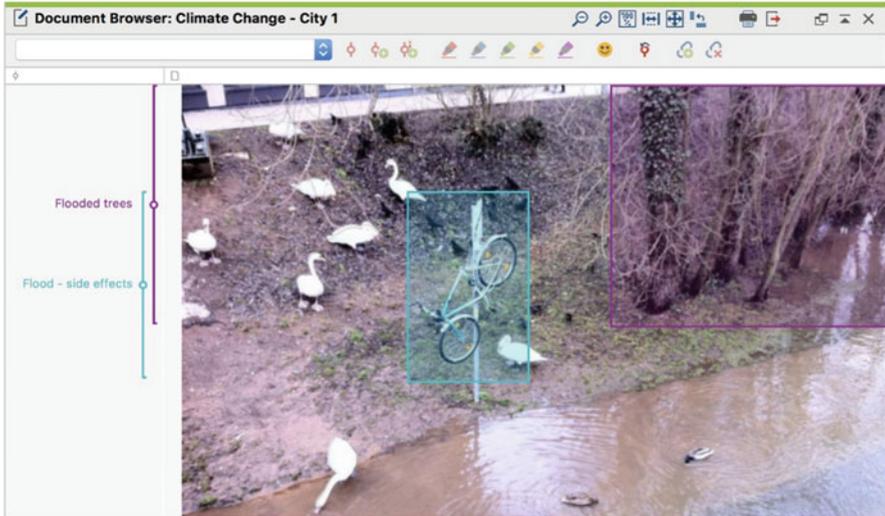
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## Coding and Analyzing Images

MAXQDA not only lets you analyze still images from videos, but as described in Chap. 3, you can also import numerous image formats. In the case of very large image files, these can be stored outside MAXQDA projects to keep the size of your project to a minimum. Images that need to be analyzed can come from a variety of sources, such as the photo documentation for evaluations. With the help of the MAXQDA Web Collector, an extension for the browser "Chrome," you can also compile web pages and then import them into MAXQDA as images (see Chap. 3). The entire website is displayed as one long image so that usability analyses of the website design can be carried out. Even photographs taken during a field study (e.g., with MAXApp, a free app for data collection) can be imported into MAXQDA as image documents.

As soon as you open an image in the "Document Browser," several icons will appear in the toolbar to adjust the view settings (Fig. 7.4): you can zoom in or out and rotate the image display clockwise. To code images, you can draw frames with your mouse, which can then be coded like text segments, e.g., by dragging and dropping the segment onto a code. The same procedure can be used to code graphics and images in PDF files.

Right-click in the gray area to the left of the image, and a dialog box will appear in which you can adjust how the coding stripes are displayed in the "Document Browser." By selecting the option *Display coded segments in image*, the coded areas are framed in the color of their codes and lightly colored as shown in Fig. 7.4. As with texts, the coded segments of different codes may overlap. As for overlapping segments of the same code, the MAXQDA logic must be respected that the same code can only be assigned once to the same segment. This rule applies to images in the sense that areas assigned with the same code may overlap, but a segment coded with code "A" can never completely surround another segment coded with the same code. Assuming that three people can be seen directly next to each other in a picture, it is not a problem if one code is applied to the three individual segments that are drawn, one for each person, whose areas slightly overlap. However, as soon as you select an area in the picture that includes all three people and the coded segments of them, and assign the same code to this area,



**Fig. 7.4** Coded image in the “Document Browser”

then MAXQDA will replace the three individual segments with one all-encompassing coded segment.

When searching for coded segments (see Chap. 9 for details), images are treated exactly like other documents: the coded parts of the image are displayed in the “Retrieved Segments” window, and clicking on the source information highlights the corresponding segment in the “Document Browser.” Memos can also be attached to coded image segments in the “Document Browser.” They are displayed, as with memos for texts, to the left of the image (Fig. 7.4). If you want to perform a detailed analysis of one section of an image, first select the relevant section, right-click on it, and then choose the option *Insert as New Document*. The section will be added as a new image document at the top of your “Document System” and can be analyzed as a separate “case.”

## References

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- Rose, D. (2000). Analysis of moving images. In M. W. Bauer & G. Gaskell (Eds.), *Qualitative researching with text, image and sound* (pp. 247–262). Thousand Oaks, CA: SAGE.