Learning How to Use a Cellular Phone: Comparison Between German and Chinese Users

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INTRODUCTION

According to the literature of cross-cultural and intercultural psychology, German and Chinese people organize their actions along different cultural norms (Bond 1992; Thomas 1996a). The objective of this study was to examine whether these differences—mainly differences of social interaction—also influence the use of typical daily products—in this case, cellular phones. One point of interest is the attitude toward different sources of information about how to use a cellular phone (for example, a user manual, online help accessible by pressing the help key, short reference manual, or informal help from friends). Furthermore, I focused on the actual use of the user manual.

THEORETICAL BACKGROUND

Dimensional concepts and cultural standards

“There is no denying that culture influences human-product interaction” (Hoft 1996, p. 41). In practice, there are still difficulties in describing and capturing “cultural influences” to create a basis for culture-fair product design.

In the field of cross-cultural psychology and training, dimensional concepts have prevailed in describing the effect of culture (see, for example, Brake, Walker, and Walker 1995; Hoft 1995, 1996). Well-known cultural dimensions include:

- Individualism/collectivism, uncertainty avoidance, masculinity/femininity, power distance (Hofstede 1980)
- High context/low context communication, polychrony/monochrony perception of time (Hall 1990)
- Universalism/particularism (Trompenaars 1993)
- Linear thinking/systemic thinking (Stewart and Bennet 1991)

These concepts sometimes seem a little “fuzzy” because each covers a wide range of values and behaviors, but they are exceptionally practical in helping to communicate cultural differences.

Another starting point is “standards of culture” (Thomas 1996c), which attempt to describe in detail pertinent cultural concepts for specific cultures. They are derived from intercultural interaction situations (for example, a situation in which German and Chinese people interact with each other) and always describe one culture from the viewpoint of another culture. They also emphasize the context in which specific cultural concepts become relevant.

I found that cultural dimensions and standards of culture have to be combined with different dimensions of the concept “learning” to make it possible to hypothesize about cultural differences. After a review of the literature and interviews with Chinese students and Chinese intercultural trainers, I concluded that the following standards of culture might influence the users’ learning process (Table 1).

Description of Chinese and German cultural concepts

In the following section, I describe cultural concepts derived from the literature and their possible effects on people’s strategies in learning how to use technical devices.

Objective of learning What is the objective of people who learn how to use cellular phones? Do users simply want to learn how to use the basic functions (like making a call and receiving a call), or do they want to be able to master every possible feature of the phone? Differences like this will certainly influence the way in which a person learns.

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Based on the literature reviewed, I suspected that different cultural dimensions influenced learning in the two cultures: pragmatism in China and idealism in Germany.

Pragmatism or realism seems to be a concept of high importance in daily life in China (Thomas 1996a). According to Yang, “. . . the Chinese have been characterized as valuing common sense and utilitarian ways of thinking highly; and even their philosophical teachings have been based on practical subjects . . .” (1992, p. 145).

I thought that in using technical products, this pragmatism may be reflected in a “quick and dirty” approach. The quick use of basic features is more important, whereas long-term mastery is often neglected. The rationale behind this behavior is that in a constantly changing environment, fast reactions are an advantage.

The contrasting behavior shown by Germans may be called idealism. Idealistic behavior highly values ideas and concepts in themselves, and they are influential in daily life (Thomas 1996c). Idealism can be seen in problem solving—for example, after the breakdown of a computer. If a person does not know why the problem occurred after the computer is again functioning correctly, he or she will not stop looking for the basic reason causing the problem.

In using technical products, this idealism can be reflected in attempts to understand as many features as possible. The rationale behind this approach might be:

1. People feel more secure if they are sure they can master the machine.
2. They assume that they can use the product more efficiently in the long run if they can master all functions.

Traditions of learning Second, I assumed that the tradition of learning—that is, learning how to learn, trained by socializing processes in family and school—should have some effect on the learning processes in daily life.

Western observers have often mentioned that rote learning is a widely used learning technique in Asian countries such as China (Mitschian 1991). For example, in examinations, students are expected to reproduce exactly the texts and facts that they have been set to learn. Manual workers traditionally learn by imitating their teachers. Learners seem to be much more “reluctant to discuss, criticize reading and express an opinion” (Samuelowicz 1987, p. 125). Historically, this learning strategy can be explained by two factors:

• Characteristics of the Chinese script The Chinese pictographical script consists of more than 50,000 different characters, of which 5,000–8,000 are commonly used in daily life. Unlike the Western phonographical script, each character has to be learned singularly. They can be mastered only by repeated memorization. The memorization strategy is transferred to other learning experi-

TABLE 1: CHINESE AND GERMAN CULTURAL CONCEPTS FOR DIFFERENT LEVELS OF LEARNING

<table>
<thead>
<tr>
<th>Chinese Cultural Concepts</th>
<th>German Cultural Concepts</th>
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<tr>
<td><strong>1. Objective of learning</strong></td>
<td><strong>Idealism</strong></td>
</tr>
<tr>
<td>Pragmatism</td>
<td>“Master all relevant or maybe relevant features. Enlarge possibilities of usage.”</td>
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<tr>
<td>“Master only the directly useful features. Improve learning time/efficiency ratio.”</td>
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<tr>
<td><strong>2. Traditions of learning</strong></td>
<td><strong>Understanding</strong></td>
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<tr>
<td>Rote learning</td>
<td>“Knowing the principles”</td>
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<tr>
<td>“Knowing by heart”</td>
<td>“Learning by exploring”</td>
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<td>“Learning by imitating”</td>
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<tr>
<td><strong>3. Information gathering strategy</strong></td>
<td></td>
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<tr>
<td>Collectivism</td>
<td><strong>Individualism</strong></td>
</tr>
<tr>
<td>“Gather information by a network of relationships.”</td>
<td>“Gather information by formal information sources (books, timetables and so forth).”</td>
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<tr>
<td><strong>4. Learning material</strong></td>
<td><strong>Script orientation</strong></td>
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<tr>
<td>Pictorial orientation</td>
<td>“High competence in understanding pictographical information”</td>
</tr>
<tr>
<td>“High competence in understanding textual information”</td>
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</table>
ences. According to Liu (1992), Chinese children learn as a rule of behavior that "If the purpose is to acquire the knowledge contained in an article, then the best strategy is to memorize the article" (p. 80).

Filial piety Historically, the teacher-student relation is thought to be similar to the traditional Chinese father-son relation. The student has to show respect to his teachers and obey them (Liu 1992). This also means that he cannot criticize or even question the teacher's statements.

It must be mentioned that the learning strategies described do not necessarily correlate with low level cognitive strategies and superficial knowledge of the learned material. According to Biggs (1996), this is a Western misconception, as the emphasis on memorization by no means excludes higher-level cognitive strategies and profound understanding.

On the other hand, the German learning tradition does not emphasize memorization very much. Knowing the facts is much less valued than knowing the principles. How to get access to facts and to evaluate them is of high importance. In school, knowing how to solve a problem is more important than the exact solution. Learning abstract principles and the ability to transfer them to new problems is emphasized.

Knowledge, especially knowledge of technical products, is acquired by careful exploration, with the objective to understand the "hows" and "whys."

Information gathering strategies The next question was "What kind of information sources do people use to learn more about how a cellular phone works?"

For the Chinese collectivistic culture, relationships are the most important resources for getting access to anything (Bond and Hwang 1992). The indigenous concept of guanxi describes the mixture of emotional and instrumental ties between people, which are most relevant for the organization of daily life. Important for guanxi is their long-term character, their reciprocity, and their scope, as even friends of friends of friends can serve as information sources. Information given by a friend also seems to be more trustworthy than written information such as timetables or user manuals.

Contrary to this behavior, in the individualistic German culture, people rely much more on formal information (Thomas 1996a). If something is written, it has much more authority than oral information. People can refer to written material again and again, which might give them a feeling of security and enables critical reviews.

Learning material The last question was “What should the learning material look like? Should there be more textual or more pictorial information?"

This question arose mainly out of the characteristic differences between Chinese and Western scripts. Whereas Western scripts are phonographical and more or less describe the sound of a word, Chinese is a pictographical language and a character (or a combination of characters) represents the meaning of a word (for details, see Chen and Tzeng 1992; Chen 1993).

Chinese characters are much more complex than the Western alphabet. Therefore, Chinese people are said to have a higher competence in the discrimination of visual patterns (Choong and Salvendy 1998). Therefore, the Chinese should show a higher prevalence for pictorial information than Germans.

HYPOTHESES
In accordance with the concepts described above, I formed the following hypotheses:

Objective of learning
✦ More Chinese than German people know and use only basic functions (pragmatism).
✦ Germans know and use a wider range of functions than the Chinese (idealism).

Traditions of learning
✦ The Chinese use more imitating strategies (rote learning).
✦ Germans use exploring strategies (understanding).

Information-gathering strategies
✦ The main source of information for the Chinese is asking other members of their peer group and gathering oral information (collectivism).
✦ The written manual is the main source of information for Germans (individualism).

Learning material
✦ The Chinese will ask for lively and colorful user manuals that contain a lot of pictures (picture orientation).
✦ Complete and consistent textual information is more important for Germans (script orientation).
METHODS

In an attempt to answer the stated questions, I used three different methods: focus groups, questionnaires, and usability tests (see Figure 1). In this section, I briefly describe the methods used; unfortunately, I do not have enough space to discuss all the problems and challenges of using these methods in different cultures.

Focus groups

“A focus group interview is a qualitative tool for collecting information in which a number of respondents simultaneously discuss a given topic under the guidance of a moderator” (Davidson 1975, p. 121). The focus group method uses natural group interaction to elicit knowledge. The “focusing” on a given topic is guaranteed by the moderator, who nevertheless allows participants to raise completely new questions.

Because the method has proven to be robust in different contexts (Morgan 1997), I thought that focus groups would be adequate for use in different cultures. Of course the method has to be modified according to the target culture: Differences in communication styles, effects of participants’ social status, data reduction by translation, and so forth had to be taken into account.

Planning Topics and questions were developed together with the Siemens Cellular phone division in Munich. The focus groups were to last 3 hours in total, and about 40 minutes of each group discussion were dedicated to the following questions:

- How did you learn how to use your cellular phone?
- What do you like/dislike about the user manual?
- What would ideal user information look like?

After the first experiences in Munich, similar focus groups were planned for China. Siemens Shanghai Mobile Communication, Ltd., provided local support.

The topics of the focus group were translated into English, as a common language between myself and the Chinese moderator. Problems like status differences of participants and possible problems resulting from “face saving” were raised and discussed. I developed a detailed guideline for the focus groups with the Chinese moderator. She made only minimal changes in comparison to the German version of the focus groups. With focus groups consisting mainly of people of the same age and profession, status and face-saving-related difficulties in interaction were minimized beforehand.

Realization In each country, four focus groups with five to eight participants were held. Participants of the focus groups were typical cellular phone users who use different brands.

In Munich, we invited 24 participants. They had been recruited by an advertisement in the local newspaper and selected by a telephone screening interview. Participants were between 22 and 54 years of age ($\bar{x} = 37$). The participants were assigned to four different focus groups that were as homogenous as possible in terms of profession and age.

The Shanghai office invited 26 participants. They were recruited through the “network of relations” of employees of Siemens, Shanghai. Nevertheless, they did not know the moderator. Subjects were between 23 and 45 years of age ($\bar{x} = 28$ years). Age differences between Chinese and German participants reflect differences in market structure.

In Munich, the focus groups took place at the Siemens Requirement Lab during February 1998. The Requirement Lab is equipped with video cameras, and the focus groups (moderated by myself) were documented on videotapes.

In Shanghai, the focus groups took place in the meeting room of a hotel in Pudong, Shanghai. As the hotel could not be reached by public transport and cars are not normally available, company buses were organized. This necessity created a side effect, as participants came to know each other before the focus group started. When the focus groups began, participants were highly talkative and seemed to feel comfortable. The focus group was moderated by a Chinese native speaker. It was recorded by portable video equipment. The original Chinese discussion was documented on one audiotrack of the tape. The simultaneous translation into English was recorded on the second audio track. The translator...
and I sat in a small supervision room next to the conference room. After each focus group, the moderator, translator, and I discussed the course of the focus group.

**Evaluation** The German videotapes and the English translation of the Chinese videotapes were transcribed. The transcripts served as primary data for qualitative evaluation following the “grounded theory” approach (Strauss 1994). Quotations were categorized and grouped together according to their similarity of described behavior or attitude. The software tool ATLAS/ti (Muhr 1997) supported the qualitative analysis of the transcripts.

**Questionnaire**

During the focus group, the participants filled out a two-page questionnaire concerning their use of the manual and other information sources.

**Planning** To supplement the purely qualitative data derived from the focus groups, I developed a short questionnaire to find out:

- Which information sources in general are important for users?
- Which parts of the user manual are of importance to the users—shortly after buying the phone and at the time of the focus group?

**Realization** The questionnaire consisted of four topics:

- **Use of formal information:** user manual, short user manual, short user reference manual (credit card size), online help
- **Use of specific parts of the user manual:** graphical overview, description of graphical symbols, description of terms, description of single functions
- **Information searching behavior:** trial and error, looking in the index, browsing through the manual, looking at the table of contents, using the online help, calling technical support, asking friends
- **Miscellaneous:** use of color, use of humor, explanations that provide depth of technical detail

Participants rated the importance of a special source of information (from very important to unimportant) and the frequency of a described behavior (from very often to never) on a 5-point scale.

**Evaluation** I tried to find typical answering schemes for the Chinese and the German participants that would predict the original answers. For that purpose, I used the rounded mean of the Chinese and the German answers to get the two prototypical answering schemes.

To evaluate the quality of prediction of these schemes, I computed the Spearman rank correlation coefficient between the answer of each subject and the answering scheme. Whereas the predictor quality of the Chinese scheme was significant for the Chinese data, it was not significant for the German data. Nevertheless, the tendency and significance of the differences for the Chinese scheme show that we can use the two schemata in discussion as typically Chinese and German.

**Usability tests**

One of the drawbacks of focus groups and questionnaires is that they do not collect actual behavior, but only what people report about their behavior. To find out more about the actual behavior, I conducted usability tests. “Usability testing . . . employs techniques to collect empirical data while observing representative end users using the product to perform representative tasks” (Rubin 1994, p. 22). Furthermore, usability tests have been successfully performed with users from multiple cultures (Nielsen 1996). Therefore, I concluded that usability tests would be an acceptable method to find out more about the actual use of mobile phones in Germany and China.

**Planning** Nine representative tasks were selected and scenarios were written for them in German. The scenarios were translated into Chinese and modified according to typical German/Chinese situations (for example, calling to give birthday greetings in Germany and calling to congratulate the family because the son passed examinations in China. The test was scheduled to last 90 minutes.

The Chinese concept of face saving was considered. I thought that the setting of usability tests might be problematic: a person’s mistakes in dealing with the cellular phone are recorded, and he or she is asked for open and direct criticism. Therefore, the Chinese moderator arranged the setting like a teacher-student situation, in which the moderator was to be positioned as a student learning from the experiences of the subject, who took the role as teacher.

**Realization** Subjects were non-cellular phone users of both genders. In each country, 12 people were invited. In Munich, the subjects were between 21 and 51 years old.

One of the drawbacks of focus groups and questionnaires is that they do not collect actual behavior, but only what people report about their behavior.
(\bar{x} = 30) and all subjects were tested individually. In Shanghai, the subjects were between 23 and 45 years old (\bar{x} = 33). Six people were tested individually, and six more people in teams of two. I hoped that in the two-person situation, the Chinese subjects might become more talkative than if tested individually. Actually, that did not happen in this setting.

Cellular phones with prototype software were tested, and a user manual in the native language was available during the test. The Chinese user manual was an exact translation of the German version, including a graphical overview, table of contents, a list of display symbols, a “getting started” section, and the description of the various functions. It was the same kind of manual already available on the Chinese market with an earlier version of the cell phone.

The German manual provided a German index; the Chinese manual had an English index, but no Chinese index because there is no alphabetical order in Chinese. In Chinese, the sorting of words follows difficult rules, concerning the word stem and the number of strokes used (Chen and Tzeng 1992). Alphabetical indexes are therefore not normally used.

In Munich, the tests took place in the well-equipped usability lab of Siemens in July 1998. Tests were moderated by the author from behind a one-way mirror. All tests were videotaped.

In Shanghai, in April 1998, usability tests took place in the meeting room of a hotel. They were moderated by a native speaker who sat next to the subject but who tried to be as uninvolved as possible. The usability tests were translated simultaneously and documented as described for the focus groups.

**Evaluation** Subjects’ comments and their behavior were transcribed in detail. These transcripts served as primary data for the following qualitative evaluation. In concentrating on the user manual, all paragraphs related to this topic were addressed.

**RESULTS AND DISCUSSION**

Before I turn to the results regarding the hypotheses, I’d like to describe the most striking differences between the Chinese and the Germans in their learning and information gathering strategies.

**China: An overview**

The Chinese test participants said that normally they would already know how to manage the basic functions: “Usually my friends would tell me how to use a cellular phone. I would just imitate what the other cellular phone users do.” Another important source of information was sales clerks: “I only learned how to use it because of the introduction from the shop assistant.”

The Chinese stated that normally, they would use only basic functions and learn to use them by trial and error: “...I just press a key and see what happens...to a certain extent the cellular phone is just like a toy.”
Only three people mentioned that they would ask their friends in case of problems with the phone. On the contrary, three participants stated they would never ask friends: “No, even if I don’t understand, I would not ask my friend.”

People said they had used the manual to get information about basic functions: “I read it by myself; at first I had the patience, but only needed to know the basic functions. At the beginning 10 minutes are enough.” The online help was rated very positively: “This is very convenient. You can learn it while operating.” Figure 2 gives a graphical overview of the described learning and information-gathering strategies. I arrived at these concepts by clustering the statements made during focus groups.

**Germany: An overview**

German participants used different learning and information-gathering strategies, as shown in Figure 3.

Imitating friends was never mentioned in Germany. The sales clerk was mentioned only once as a source of information. “Learning by doing” was of importance to the Germans. Participants emphasized that by using the phone practically, the user interface principles might be learned and memorized more easily than by just reading the manual.

Six people stated they would ask friends or relatives if they had problems with the phone: “It’s like that, I don’t know a lot about technology. . . . I asked my husband to explain it to me.” Six people said reading the manual in detail was the main source of information. One participant explained: “I read the user manual quite a long time. It was exciting; actually, I read the whole manual.” Another one said: “I read the whole manual to get a basic overview.”

Participants had different opinions about the online help. Although the idea of online help was rated positively, in daily life it was not perceived as useful: “It is like the online help on the computer: After reading it, you feel even more puzzled than before.”

**Objective of learning**

As described before, the Chinese participants mainly used and knew only the basic functions of their cellular phones. The typical reason given in focus groups and usability tests was “I have no patience.” This probably means “I think it is an inefficient strategy to spend time on getting to know functions I don’t want to use.”

On the other hand, a typical German statement was “First I want to get acquainted with the cell phone and have a look at the user manual. . . . I have a look at the overview of functions. . . . and at the graphical overview.” Remarks like this were made 10 times during usability tests in Germany, but only once in China.

The objective behind this behavior might be described as “I think it is an efficient strategy to spend time on getting to know different functions. They might be useful in the long run.” These results strongly support the hypotheses about the influence of **pragmatism** in China and **idealism** in Germany.
Traditions of learning

Neither the Chinese nor the German participants tried to learn the user manual “by heart” during usability tests. The context of cell phone use does not seem to prompt this cultural concept of learning by heart. According to focus groups results, Chinese people more often use functions that they already know by heart and that they acquired at the very beginning. They had learned these functions primarily from their friends or the sales clerk’s demonstrations. Here, learning by imitating was a widely used strategy.

During usability tests, subjects of both groups tried to explore functions of the cellular phone and there was no perceptible difference in the learning behavior they showed. Nevertheless, there are indications of the influence of the cultural concepts.

Complaints during the usability tests showed German attempts to understand the principles. “That sentence is not logical”; “The use of this icon is not consistent”—remarks like these occurred eight times during usability tests in Germany.

Another indication for the influence of cultural concepts were suggestions for improving the manual.

In China, usability test subjects mentioned seven times that they would like to have a clear step by step explanation: “It should tell me step by step, not in one sentence. . . . just give me a procedure.”

The Germans’ ideas for improvements were short instructions at the beginning of the user manual.

According to the results described, the concepts of learning by imitating in China and of knowing the principles in Germany do influence people’s strategies of learning.

Information-gathering strategy

Main differences in information gathering have already been described. In short, the Chinese people rely more on informal and oral information, whereas printed user manuals are the main source of information for Germans.

Nevertheless, some remarks from the Chinese focus groups seem to contradict these general findings: Three people said explicitly that they would not ask their friends if they had difficulties in using their cellular phone. While looking at the data in detail, I found out that imitating friends is a normal way of learning at the beginning. But some difficulties normally occur after a period of usage. At that time, asking others may lead to loss of face. As a consequence, the Chinese often do not use more complicated functions. Attempts to save face might also explain why the Chinese prefer the help function to the manual: “. . . operating the cellular phone at the same time you use the manual, it is ridiculous. . . . it gives you a very foolish feeling.”

The questionnaire data shows several differences between German and Chinese subjects in the areas of use of formal information, use of specific parts of the user manual, and information searching behavior.

♦ Use of any kind of information The main source of information in the first week of usage for German subjects is the user manual, whereas the Chinese favor the online help. In everyday usage, they also prefer the online help to printed documentation. The German subjects shift their preference from printed manuals toward the online help. In general, the Chinese subjects’ statements show that they make less use of nearly any kind of information sources.

♦ Use of specific parts of the user manual All subjects, Chinese as well as German, favored explanation of specific functions during the first weeks of ownership of their cellular phone. This tendency prevailed in everyday usage. Furthermore, the Chinese subjects stated that they also used the overview of the cellular phone rather frequently in the first week. Again, Chinese subjects in general used sources of information less often than German subjects.

♦ Information-searching behavior When asked about general information-searching behaviors, the Chinese subjects stated that the trial and error method was most important. This method of information searching is the one also highly valued by German subjects. Furthermore, Germans stated that the index and the table of contents were equally important.

How did people look for information during usability tests? In the beginning, Germans looked at the table of contents, but later on they relied heavily on the alphabetical index (11 times during usability tests). One person expressed the typical difficulty with this strategy as follows: “I am looking at the index at the back [of the manual], but I don’t know which term I should look for.” Problems with the terminology were stated 16 times during usability tests in Germany.

The Chinese primarily used the table of contents to find the relevant information and then continued by trial and error. Problems with terms were not stated explicitly. As pointed out before, alphabetical indexes do not exist in Chinese documents. This fact obviously influenced the searching strategies.

Generally speaking, the findings for the Germans fit very well with the stated hypotheses that printed material is the main source of information.
Generally speaking, the findings for the Germans fit very well with the stated hypotheses that printed material is the main source of information. Furthermore, the data shows that specific terms often serve as starting points for this search. The hypothesis for the Chinese participants had to be modified: In contrast to early use, when the peer group is the main source of information, people do not ask their friends for information if difficulties occur later on, most probably because of the fear of loss of face. Therefore, the high quality of information within the cellular phone itself (that is, the online help) is especially important.

Learning material
What should the ideal user manual look like? Germans considered most important that the information given in the user manual be clearly written and complete. People stated that they would like to have all technical information available. The manual should be designed in a way that enables them to find the information they need very quickly.

Chinese people demanded more pictorial information: “First, there should be less written language and more pictures.” Emphasis was placed on the illustration of procedures: “It should give me more accurate pictures and illustrated procedures.” Detailed suggestions for the improvements of the typography were given: “Size should be according to importance . . . and there should be less content in a page.” Only in the Chinese focus groups did participants ask for video instructions or instructions on CD-ROM: “If you have a videotape, this will give us a very vivid example. . . . If you can see with your own eyes, you are relieved and you have the courage to do what the videotape shows you.”

CONCLUSIONS
What do these results mean for engineers and technical writers? How can they adjust their products to the Chinese and German markets, respectively? Obviously, it is not always possible to write completely different manuals for each country, but some differences should be taken into account. Table 2 gives an overview of my conclusions and suggestions about how to design information for Chinese and for German cellular phone users. This table is not meant as a guideline that one can simply transfer to any kind of technical communication. It is meant as a synopsis of the results of my own empirical research. I hope that you will be able to transfer the kind of research I have done to the multicultural user environments you encounter in your own work.

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