



Talk to me personally: Personalization of language style in computer-based learning



Maria Reichelt^{a,*}, Frauke Kämmerer^b, Helmut M. Niegemann^b, Steffi Zander^a

^a Bauhaus-University Weimar, Instructional Design, Geschwister-Scholl-Straße 7, 799423 Weimar, Germany

^b University of Erfurt, Educational Science, Nordhäuser Straße 63, 99102 Erfurt, Germany

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ABSTRACT

The personalization principle is a design recommendation for computer-based learning which states that multimedia instruction using personalized language promotes learning better than those using formal language. Formal texts can be personalized by replacing impersonal articles with possessive pronouns or directly addressing learners (e.g. using the second person). The effectiveness of this recommendation has been tested primarily in high school or college student populations. Although computer-based learning is increasingly popular in continuing education settings, currently there are no empirical studies into the personalization principle. The present study investigates whether personalized material leads to positive motivational effects and increased learning outcomes for different target groups. German college students and participants in continuing education ($N = 127$) received either a personalized or formal version of a computer-based program concerning gestalt laws. Regardless of the target group, personalization effects were found for motivation and retention, but not for transfer. To gain further insight into how learners perceive the computer depending on language style, the think-aloud method was used. Based on these findings, already existing approaches to explain personalization effects are discussed in relation to new extracted factors (e.g. emotional aspects).

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1. Introduction

In order to enhance computer-based multimedia learning, previous research has investigated different instructional conditions and proposed various design principles (e.g. the personalization, image, or voice principles, Mayer, 2005, 2009). These principles are supported by a wealth of research evidence (e.g. Clark & Mayer, 2003; Mayer & Moreno, 2003; Moreno & Mayer, 2000; Paas, Renkl, & Sweller, 2003; Sweller, 1999). In the present study, the *personalization principle* (Mayer, 2009) is examined with regard to the motivation of learners and learning outcomes. This principle states that people learn better from multimedia instruction when texts are written in a personalized (conversational) language style, rather than a formal (neutral) style (Mayer, 2009). Here, the personalization principle is considered in the context of human-computer interaction, using cognitive load theory and media equation theory as the theoretical framework. According to cognitive load theory (Chandler & Sweller, 1991; Paas et al., 2003; Sweller, 2005), computer-based learning material should be designed to

reduce cognitive load (CL) and encourage learners to use their free cognitive resources to process essential information (Mayer & Moreno, 2003; Sweller, 2005; van Merriënboer, Kirschner, & Kester, 2003). To reduce CL, interest in the learning material should be enhanced, as higher interest promotes the effective use of available cognitive resources (Harp & Mayer, 1998; Renninger, Hidi, & Krapp, 1992). Interest in learning may be enhanced by language personalization, since personally addressing learners increases their identification with the computer (Mayer, 2005; Moreno & Mayer, 2004; Stiller & Jedlicka, 2010). This line of reasoning can be understood in the context of media equation theory (Reeves & Nass, 1996), which assumes that people can easily accept a computer as a social partner and that the dynamics of human-human interaction can be applied to human-computer interaction. Hence, this theory implies that social and emotional factors play a role in interaction with a medium (Nass & Brave, 2005). To summarize, a personalized language style is recommended in computer-based learning environments in order to facilitate the perception of the computer as a social interaction partner (Mayer, 2005, 2009). This stimulates interest in the learning material, which in turn promotes the effective use of the available cognitive resources (cf. cognitive load theory), resulting in better learning outcomes (Hidi & Baird, 1988).

* Corresponding author. Tel.: +49 3643 5832 29.

E-mail address: maria.reichelt@uni-weimar.de (M. Reichelt).

However, the empirical findings on the personalization principle to date have not been consistent, leading to an on-going discussion of the use of a personalized language style on what factors influence the positive effect of personalization on motivation and learning (e.g. [Ginns, Martin, & Marsh, 2013](#); [Kartal, 2010](#); [Kurt, 2011](#); [Rey & Steib, 2013](#); [Stiller & Jedlicka, 2010](#)). The present study can be seen as an answer to [Ginns et al.'s \(2013\)](#) and [Rey and Steib's \(2013\)](#) calls to test personalized language style in a variety of different contexts (e.g. language areas) with varied learner profiles (e.g. levels of education) in order to determine the universal value of the design recommendations. Following these suggestions, the personalization principle can be given a priority in design studies, as language style is highly culture-specific. In order to address variety in contexts, this study was conducted in a German-speaking area, which has been underrepresented in previous investigations. Regardless of the language area, the effectiveness of the personalization principle in computer-based learning has been tested primarily with college (e.g. [Kartal, 2010](#); [Moreno & Mayer, 2000, 2004](#)) or high school students (e.g. [Stiller & Jedlicka, 2010](#)). To address this issue, the first purpose of the present study was to investigate whether personalization effects hold for different target groups in university and continuing education settings. The second purpose was to examine subjective views (e.g. possible preferences) in the different target groups regarding the language style used in the computer program, thereby gaining more insight into the effect of different language styles on learners' perceptions of the computer.

2. Literature review

2.1. Research into the personalization principle

According to [Mayer \(2009\)](#), personalized language style can be formed in two ways, as demonstrated in [Table 1](#).

These two methods for personalizing learning instructions were also used in the present study to manipulate formal texts. Since the research questions of the present study focus on learning with the use of a computer, the research presented below only refers to computer-based learning environments (cf. [Ginns & Fraser, 2010](#) for an example of paper-based material).

Research into the personalization principle was initially conducted in an English-speaking area. In [Moreno and Mayer's experimental series \(2000\)](#), college students received a multimedia explanation of 'lightning' (Exp. 1–2) or played a computer game about environmental science that included a pedagogical agent (Exp. 3–5). Personalized messages (using first and second person) resulted in higher problem-solving transfer than formal messages (using third person) across all experiments. This effect was found for retention, only in experiments 3–5 (agent-based computer game). In another experiment by [Moreno and Mayer \(2004\)](#), college students learned with an agent-based multimedia educational game. The game was presented via desktop computer (low immersion) or head-mounted display (high immersion). The agent used personalized language ('I' and 'you') or formal language (third person). Students who received personalized agent instructions performed better in retention and transfer tests. These results were

independent from the level of immersion. Additionally, it was found that participants learning with personalized instructions rated the program as more friendly and helpful but less difficult than participants in the formal group. In [Mayer, Fennell, Farmer, and Campbell's study \(2004\)](#), college students learned with either a personalized (using 'your') or a formal version (using 'the') of a narrated animation about human respiration. In three experiments, students who received the personalized version scored significantly higher on transfer tests compared to students who received the formal version. This effect was not found for retention. In recent years, studies on personalization effects have also been conducted in other language areas (e.g. Turkish and German).

[Kurt's \(2011\)](#) study on personalization effects in Turkish showed no significant differences between the level of prior knowledge of the personalized and formal group and their post-test achievement scores. The cognitive load (cf. [Paas & Van Merriënboer, 1993](#)) of the personalized group was significantly higher than that of the formal group. This finding does not support the personalization principle ([Mayer, 2005, 2009](#)). This may be because in the Turkish education system, instructional content is mostly presented in a formal style; [Kurt \(2011\)](#) argues that Turkish students might be unfamiliar with a personalized style. College students in the personalized group were given a five-point Likert-type questionnaire related to the personalized style version of the software they studied with (e.g. 'I want this style to be used in face-to-face education as well'). They most commonly stated that the style used in the learning environment motivated them to learn and that they wanted it to be used in face-to-face education. [Kartal \(2010\)](#) also tested the effectiveness of the personalization principle in the Turkish education system. The main purpose was to uncover the relationship between learning and language style with varying degrees of personalization: personalized-informal (P/I) (e.g. 'Did you [singular] attend class?'), personalized-formal (P/F) (e.g. 'Did you [plural] attend class?'), and neutral-formal (N/F) (e.g. 'Was the class attended?'). College students learned using computer-based instructional content (illustrative pictures and animation) composed in one of these styles. Students in the P/I group performed better on retention and transfer than those in the N/F group. No significant differences were found between the P/F group, N/F and P/I groups on retention or transfer. Learners who interacted with a computer program designed using a personalized style (P/I and P/F) reported higher levels of interest, rated the content as less difficult, and the language style as friendlier.

[Schworm and Stiller \(2012\)](#) examined personalization effects by using German texts and varying the intensity of personalization in a computer-based learning environment. College students were assigned to one of three conditions: formal text using third-person constructions, weak personalized text using the pronouns 'you' and 'I' and their possessive forms, and strong personalized text including personalization (cp. second condition) and additional direct comments to the learner. The results showed that personalization fostered the acquisition of transfer knowledge more effectively than the formal control group. However, retention was not affected. In contrast to the assumptions, varying the intensity of personalization had no effect. [Stiller and Jedlicka \(2010\)](#) investigated whether personalization effects are dependent on domain-specific prior knowledge; a total of 65 German senior high school students (10th grade) received computer-based instructions about the human eye (static pictures and on-screen text). Learners with low prior knowledge receiving the personalized version of material (using 'your' instead of 'the') scored significantly higher on learning tests across all types of tasks (e.g. drawing, labeling). Learners with high prior knowledge also improved in drawing and labeling performance through personalization; however, their transfer performance was not improved. In [Rey and Steib's \(2013\)](#) study, Austrian students in a lower secondary school worked with

Table 1
A sample of methods for personalizing learning instructions.

Making changes from third person to first and second person	For example: 'You can see in the picture...' instead of 'One can see in the picture ...'
Adding sentences which directly address the reader	For example: 'Compare the following illustrations!'

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