



2 The Effects of Personalised Negotiation Training on Learning and Performance in Electronic Negotiations

Abstract

Individuals have different learning styles and thus require different methods for knowledge acquisition. Whereas learning theories have long acknowledged this fact, personalised negotiation trainings especially for electronic negotiations have rarely been developed. This paper integrates learning styles and negotiation styles and reports on an implementation of this integration. We will discuss personalised negotiation trainings, namely an enactive training and a vicarious training, that we developed to match the learners' learning styles. Such a matching is proposed to be beneficial regarding learning outcomes. Furthermore, positive effects on the dyadic negotiation outcomes are assumed. To this end, an experiment with participants from different European countries was conducted. The results show tendencies that personalised negotiation trainings lead to better skill acquisition during the training and also to fairer negotiation outcomes. Overall, this paper contributes an integration of the theories on individual differences from the domains of negotiation and learning as well as valuable insights for further experiments on individual differences in negotiations.

Co-Author

Prof. Mareike Schoop, PhD

Reprinted by permission from Springer Nature: Springer Science+Business Media Dordrecht, Group Decision and Negotiation, The Effects of Personalised Negotiation Training on Learning and Performance in Electronic Negotiations, 25 (6), 2016, pp. 1189-1210, Philipp Melzer, Mareike Schoop, available at <https://link.springer.com/article/10.1007/s10726-016-9481-y> © 2016

2.1 Personalised Negotiation Training to Improve Electronic Negotiation Skills

Negotiations within or between companies are daily business tasks for managers who are expected and required to be skilled negotiators achieving optimal negotiation outcomes, saving costs, and establishing long lasting relationships with important business partners. Negotiators, therefore, need to acquire years of experience and/or attend proper training. Such experience or training is very expensive; thus, skilled negotiators are often considered to be valuable company assets. In management education, the topic of negotiation training emerged in the 1980s and provoked much research until today. Research on electronic NSSs shows the willingness of negotiators to use such systems simulating negotiations to try out different strategies (Vetschera et al. 2006). Since the development of the first NSS, more and more support functionalities have been integrated to provide holistic support (Schoop 2010). At the same time, context-sensitive NSSs have been called for which present only relevant information and support features to the negotiators, based on their individual characteristics (Gettinger et al. 2012).

End-user training (EUT) has been found to increase utility and adoption of ISs (Igbaria et al. 1995). EUTs have also been the focus of research on the integration and evaluation of individual characteristics of learners and training methods providing a personalised approach (Gupta and Anson 2014). However, current trainings in companies still follow the same teaching (and thus learning) approach for all participants.

Bringing together the needs for negotiation training in companies and personalised EUTs, our research aim is to develop a framework for personalised e-negotiation trainings. Those trainings are evaluated pursuing the research question whether negotiators attending personalised trainings with training methods matching their personal learning styles achieve better learning and negotiation outcomes than those with a mismatch between learning style and training method. The outcomes are tested in the EUT as well as in a subsequent negotiation experiment using an NSS.

To this end, the methodology of DBR is used (Brown 1992). DBR focuses on the development, evaluation, and iterative improvement of learning interventions within real-life educational scenarios aiming at enhancing design principles and at deriving new theories.

2.2 Creating Personalised Negotiation Trainings Based on End-User Training Best Practices

The EUT framework structures the complete process of preparing, conducting and evaluating an EUT beginning with the pre-training phase, describing the actual learning process influenced by the training method used, eventually leading to specific learning outcomes (cf. Figure 4).

Most importantly, EUTs have to be adapted to the specific target system; in our case the NSS Negoisst (Schoop et al. 2003; Schoop 2010). In the pre-training phase, training goals have to be defined which relate to the learning outcomes to be measured afterwards. These learning outcomes can be differentiated into skills, cognitive outcomes, affective outcomes, and metacognitive outcomes following the epistemological perspectives of the designer (Bloom et al. 1984). The current study focuses on the evaluation of learning outcomes especially skills measured directly after the training as well as after the negotiation. The main EUT contains the training method to be implemented, the learning process as well as their interaction. Concerning the method of training, it should be specified whether to use computers as trainers or as a medium of training. The learning techniques also need to be specified. Individual differences of learners influence the learning process, since they need to be supported regarding content as well as process. Learning process and training method will be described in detail in sections 2.2.1 and 2.2.2 as they are vital for the matching of training method and learning style which constitutes the notion of personalised learning used throughout this paper.

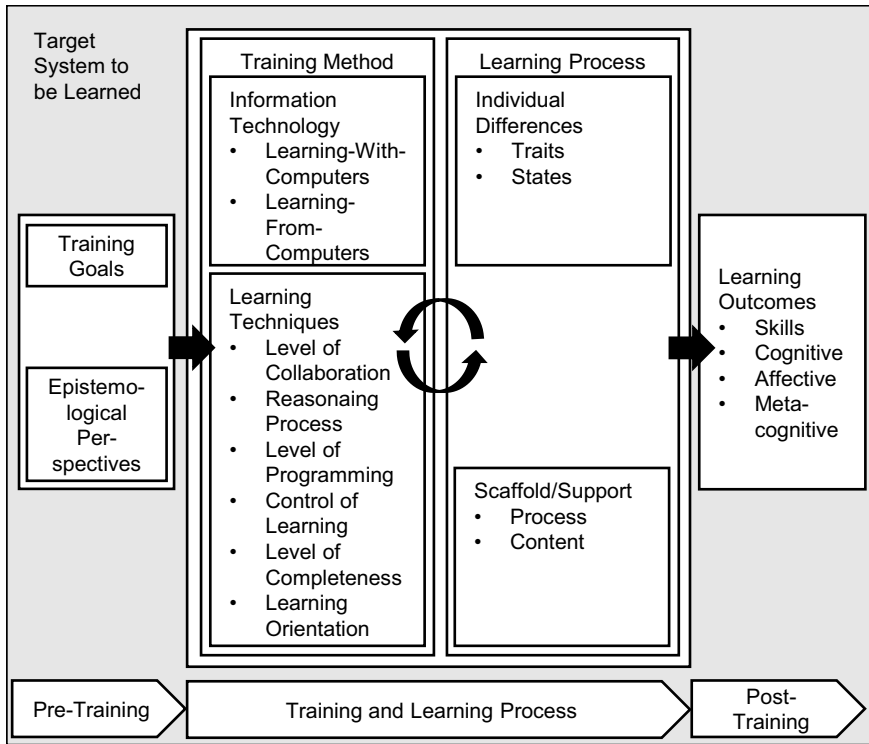


Figure 4 Framework for End-User Training Research (adapted from Gupta and Bostrom 2006, p. 173; Gupta et al. 2010, p.12)

2.2.1 Training Methods and Related Learning Techniques

Recent studies on EUT research concentrate on social cognitive theory (SCT; Gupta et al. 2010). SCT is rooted in the paradigm of constructivism, which is also a prominent approach in e-learning, rejecting traditional knowledge transfer between teachers; instead focusing on the students constructing their knowledge themselves (Kafai 2006).

SCT views learning as the intentional task using direct personal reflection, reflection by others, or interdependent and coordinative learning in groups. SCT distinguishes enactive learning (i.e. observing one’s own learning process while constructively acquiring new knowledge) and vicarious learning (i.e. observing and imitating experts to acquire new

knowledge). According to SCT, a mix of both methods is the best training method for complex tasks as each method has particular advantages and disadvantages (Gupta et al. 2010).

2.2.2 *Learning Process and Individual Differences*

For management studies assessing the relationship between tasks and learning preferences, Kolbs' Learning Style Instrument (Kolb 1984) and Honey and Mumford's Learning Style Questionnaire (LSQ; Honey and Mumford 2000) are the most widely used instruments. Both are based on the constructivist model of experiential learning defining learning as a

“process whereby knowledge is created through the transformation of experience” (Kolb 1984, p.41).

Experiential learning is described as a cyclic process following four phases, namely

- 1) having a new experience;
- 2) reviewing on this experience;
- 3) concluding from this experience; and
- 4) planning the next steps.

Although learners have to complete all phases they possess individual preferences and skills for one or more of these phases. Accordingly, they can be classified as having activist, reflector, theorist, or pragmatist learning styles (cf. Figure 5). However, these styles are not static but might change depending on the learning task or previous learning experience (Kolb 2000). Learning styles are related to certain behavioural patterns (Honey and Mumford 2000). Activists are described as being open-minded, eager for being exposed to new situations, thus likely to welcome change. They often rush into action without preparation being bored by consolidation tasks. Pragmatists are technology-oriented and eager to test out things in practice. In general, they are more task-oriented than people-oriented. They try to seize the first solution that comes up and reject anything without an obvious application. Overall, activists and pragmatists share numerous properties and are consequently considered as following a practical learning style in the remaining paper.

Reflectors are thorough, methodical thinkers and listeners to assimilate information. They rarely jump to conclusions and, therefore, are rather slow to make up their minds having a tendency to hold back from participation avoiding risks. This leads to a rather unassertive communication style. Theorists represent even more logical and rational thinkers, are often restricted to their thoughts, and have a low tolerance for uncertainty and subjective intuition, aiming to generate sound theories. Reflectors and theorists rely on similar mind-sets and are thus considered to be following a theoretical learning style in our work.

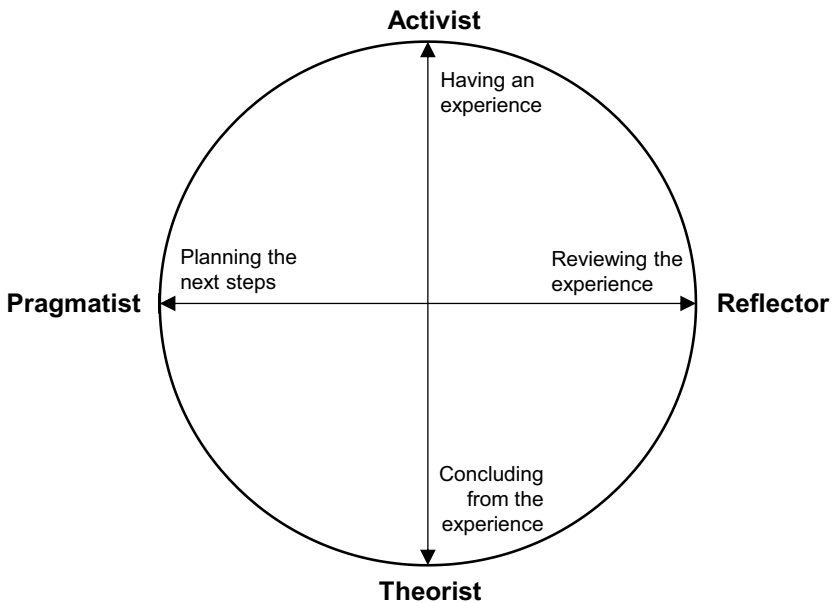


Figure 5 Model of Experiential Learning and Corresponding Learning Styles (adapted from Mumford and Honey 1992, p.10)

2.2.3 *Development of Personalised Negotiation Trainings Matching Training Methods and Learning Styles*

While negotiation styles are used to identify negotiators and predict their behaviour (de Moura and Seixas Costa 2014) approaches to use individual differences of negotiators to improve learning are not existent to our

knowledge. Previous research on EUTs analyses training methods and learning styles and often suggests their interrelation (Sein and Bostrom 1989; Davis and Bostrom 1993). Most studies argue that specific matching combinations between training methods and learning styles are particularly effective. Enactive training methods (emphasising exploration, collaboration, and situatedness) are proposed for practical learning styles whereas vicarious training methods (emphasising reflection, individual learning, and abstract generalisation) are proposed for theoretical learning. Such matching has been demonstrated to induce differences regarding learning outcomes between matches and non-matches (Sein and Bostrom 1989; Bostrom et al. 1990; Gupta and Anson 2014; different opinion is presented by Ruble and Stout 1993).

Integrating the specific requirements of negotiation trainings and EUTs, we developed two EUTs for the NSS Negoisst, namely one for practical and one for theoretical learning styles implemented as an enactive and vicarious training respectively but with identical content (Melzer and Schoop 2014a; Melzer and Schoop 2014b). In the enactive EUT the learners have to acquire negotiation basics, prepare a negotiation, get familiar with Negoisst, and use it to implement their prepared negotiation strategy in a training negotiation, following an inductive trial-and-error approach. The learners explore the tasks collaboratively in groups and later discuss their results in class. The trainer only moderates this discussion and reviews or supplements its results if necessary. Therefore, the learners are in control and a high level of interaction is supported. In the vicarious training, learners are encouraged to learn individually from the trainer as the negotiation expert who always remains in front of the class and presents the contents without much interaction. The trainer presents negotiation preparation basics, strategies as well as the underlying concepts and features of Negoisst in a deductive manner. The learners are then guided through the system by the trainer simulating a ready-made negotiation. Therefore, the vicarious training follows a programmed approach, keeping the trainer in control of the learning.

2.3 Hypotheses

Following DBR, we will derive hypotheses to answer the research question, whether an EUT with matching training method and learning style is

superior to non-matching combinations regarding learning as well as negotiation outcomes both on individual and dyad level.

2.3.1 *Individual Hypotheses*

Typically, objective negotiation performance is evaluated using measures of utility commonly calculated using linear additive preference models showing the achievement of objectives (Keeney and Raiffa 1976). Individual differences in negotiations can be distinguished using the theory of social value orientation (SVO; Messick and McClintock 1968; De Dreu and Boles 1998) or the theory of the managerial grid (Blake and Mouton 1964). While the SVO distinguishes proself negotiators maximising their own gains from prosocial negotiators who are much concerned with others' gains, the managerial grid adds the dimension of assertiveness to the dimension of cooperativeness. The Thomas-Kilmann Conflict MODE instrument (Kilmann and Thomas 1992) defines the negotiation styles accommodating, avoiding, compromising, competing, and collaborating according to their degree of assertiveness or cooperativeness displayed in Figure 6. Based on the description of matching and non-matching combinations in sections 2.2.1 and 2.2.2, negotiation outcomes should be predictable: Practical/enactive negotiators (practical negotiators in the remaining paper) are assumed to be collaborative because of their high social competence working with others and their assertive character. Following this style of negotiation, they should achieve higher individual utilities than other negotiators (Ma et al. 2012). Theoretical/vicarious negotiators (theoretical negotiators in the remaining paper) are assumed to have an avoiding negotiation style, carefully preparing their negotiation strategy and rationally evaluating their next steps, disregarding relationship-building due to low social competence which may set back their negotiation success. Low uncertainty tolerance might lead to suboptimal decisions under uncertainty resulting in lower individual utilities. To predict negotiation behaviour for non-matching negotiators, it is important to know whether the effect of learning styles or training methods is more influential. Assuming both effects being equally important such negotiators avoid extreme behaviour leading to a compromising negotiation strategy. According to previous studies on individual differences (Ma et al. 2012; Gupta and Anson 2014), we assume no effect of a matching on individual utility because the effects

of practical negotiators achieving higher individual utilities, theoretical negotiators achieving lower individual utilities and non-matching negotiators achieving mediocre individual utilities are balanced out.

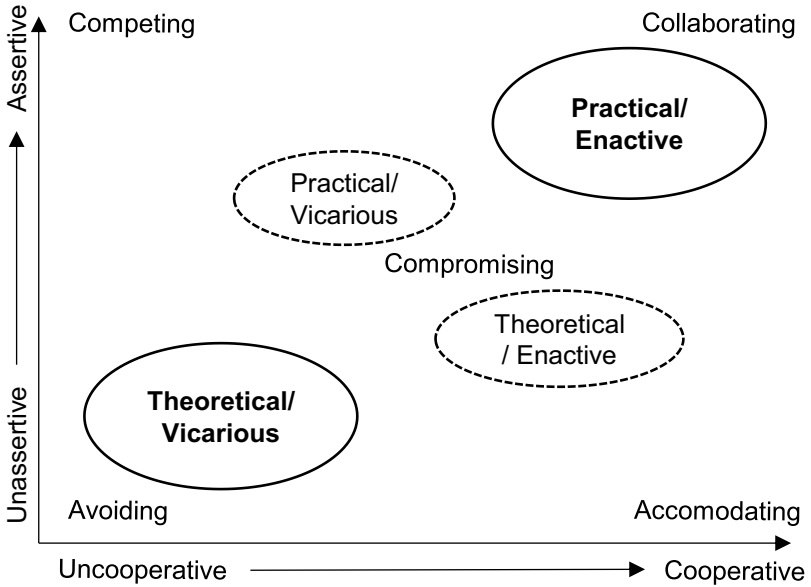


Figure 6 Predicted Negotiation Styles of Matches and Non-Matches Based on the Managerial Grid (Blake and Mouton 1964; Kilmann and Thomas 1992)

Thus, we formulate our individual hypotheses on learning outcomes measured by skill acquisition. To account for electronic negotiations, skill acquisition is distinguished into face-to-face negotiation skill acquisition (H1a) and electronic negotiation skill acquisition (H1b). Early studies on personalised EUTs could demonstrate improved skill acquisition (Sein and Bostrom 1989; Bostrom et al. 1990). Thus, we hypothesise, that a matching training method and learning style should lead to better skill acquisition.

H1a: Matching negotiation trainings lead to better perceived acquisition of face-to-face negotiation skills.

H1b: Matching negotiation trainings lead to better perceived acquisition of electronic negotiation skills.

2.3.2 *Dyadic Hypotheses*

Negotiations are interdependent tasks integrating individual skills, styles, and attitudes of all negotiation parties. Thus, the existence of a matching combination of training and learning style needs to be evaluated on a dyad level to assess its influence on negotiation effectiveness, efficiency, and fairness. Therefore, bilateral negotiations featuring two, one, or no negotiator(s) exhibiting the proposed benefits of a personalised negotiation training are analysed to investigate whether those benefits can be transferred during the negotiation probably providing an even more beneficial outcome. Effectiveness is operationalised via the agreement rate. Outcome efficiency is measured using joint utility (Delaney et al. 1997) as well as the distance of an agreement to the Pareto-frontier (Raiffa et al. 2002), while fairness of an agreement is defined as the contract imbalance between both negotiators (Delaney et al. 1997).

Practical negotiators have been categorised in section 2.3.1 to follow a collaborative negotiation style. This affects their negotiation behaviour in numerous ways: Practical negotiators should reach fewer negotiation agreements due to

- 1) a weak ability to put oneself in the position of the negotiation partner and
- 2) misconceptions about negotiation goals because of missing preparation.

Furthermore, rushing into a negotiation posing high demands often increases the conflict situation of a negotiation leading to distributive bargaining and a high possibility of impasse situations. Practical negotiators are fast in exchanging offers which should lead to more competitive communication behaviour reducing negotiation effectiveness (Pesendorfer and Köszegi 2006). Regarding negotiation efficiency and fairness, a long period of haggling with only small improvements is often necessary to optimise an agreement. Thus, practical negotiators often fail to achieve efficient and fair outcomes seizing on the first expedient agreement. Theoretical negotiators have a high endurance in optimisation of the agreement

and can use the advantages of asynchronous message exchange in negotiations. However, they are restricted to their way of thinking having problems to work with others who rely on a communicative approach or on finding creative solutions. Thus, inconclusive endings of negotiations are also possible. Such behaviour, in line with the notion of the negotiation dilemma, leads to efficient and fair outcomes, but low agreement rates.

Analysing negotiation dyads having the same or different level of cooperativeness has been performed using the SVO (Olekalns and Smith 1999). This study demonstrated that prosocial (corresponding to practical negotiators) dyads explicitly focus on strategies of relationship-building such as supporting the negotiation partner or restructuring the negotiation agenda in potential impasse situations. Proself (corresponding to theoretical negotiators) dyads employ a mixture of relationship-oriented strategies and more task-oriented strategies, e.g. exchanging priority information or making concessions, while mixed dyads solely concentrate on task-focused strategies. It also confirms our notion of a more relationship-oriented focus for equally matching dyads compared to a more task-oriented focus for mixed ones. Thus, we expect more effective and efficient outcomes with fairer agreements for dyads in which the negotiators have the same training method and/or learning style.

- H2: Dyads in which both negotiators attended a matching training achieve more effective outcomes than dyads with only one or no negotiator attending such training.
- H3: Dyads in which both negotiators attended a matching training achieve more efficient outcomes regarding
 - H3a: joint utility than dyads with only one or no negotiator attending such training.
 - H3b: distance to the Pareto-frontier than dyads with only one or no negotiator attending such training.
- H4: Dyads in which both negotiators attended a matching training achieve fairer outcomes than dyads with only one or no negotiator attending such training.

2.4 Methodology

To answer the hypotheses, we performed a negotiation experiment which will be described in the following chapter.

2.4.1 Participants

The evaluation of personalised negotiation trainings was conducted involving 178 graduate students from two European universities. 91 students enrolled in communication sciences, 23 in ISs, 22 in management, 16 in international business and economics, 1 in economics, 1 in agribusiness, 20 exchange students, and 4 students of unknown course. All participants attended a one semester course on negotiations and were rewarded for participation in the experiment by receiving credit points.

2.4.2 Experiment Procedure and Measurement

Before the trainings, participants filled in a survey assessing demographics as well as the LSQ to determine their individual learning style (Honey and Mumford 1992). Each participant was then assigned to one of the trainings to create two groups equal in size, previous skills, and distribution of learning styles. After the trainings, a ten-day negotiation simulation with the Negoisst system was conducted to measure task performance, namely negotiation effectiveness, as well as efficiency and fairness of the agreements. Participants negotiated a bilateral buyer-seller dispute resolution scenario. The case includes several distributive and integrative issues to be negotiated focusing on warranty issues of a recently bought laptop. Negotiators were provided issues and preferences per party assuming no alternatives to negotiation. After the negotiation, another survey assessed the acquisition of negotiation and e-negotiation skills.

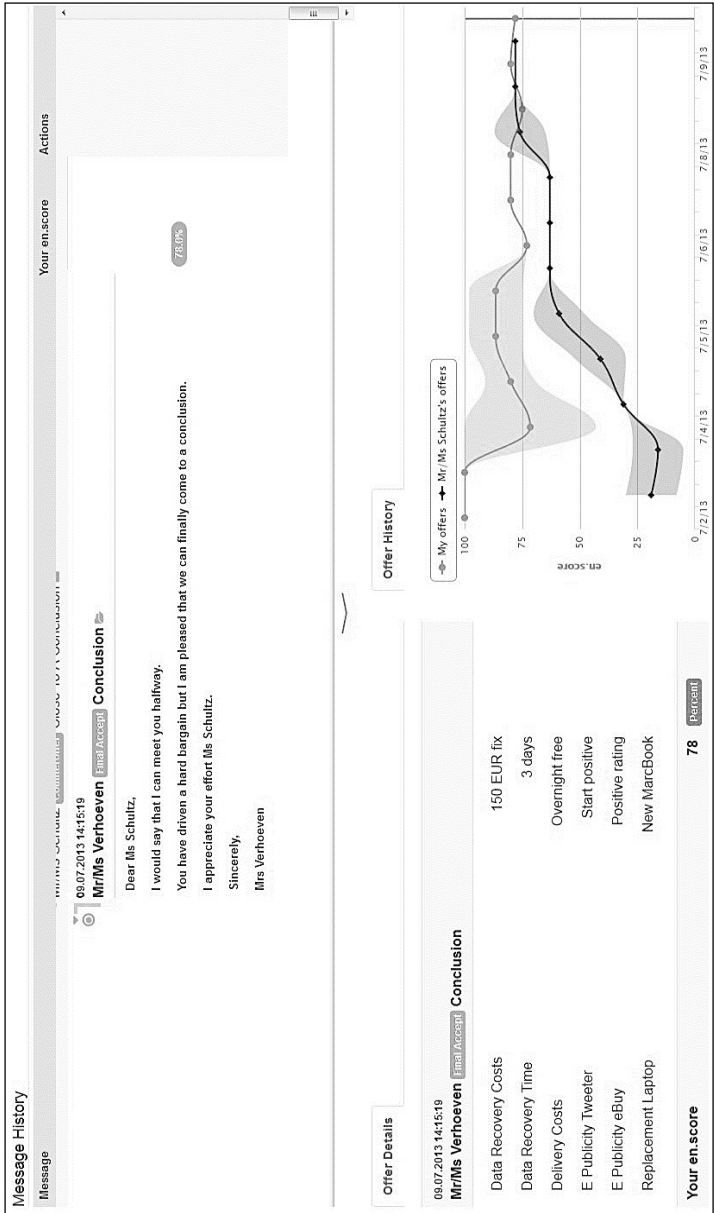


Figure 7 Main Screen of Negoisst

2.4.3 *Negoisst System*

The NSS Negoisst (Schoop et al. 2003; Schoop 2010) follows a holistic support paradigm implementing decision support, communication support, and document management support (cf. Figure 7). Negoisst enables its users to elicit their preferences using this information to calculate utility values for every (counter)offer sent and received. A history of offers provides a graphic representation of the negotiation. Communication support is realised implementing a negotiation agenda representing issues, values, units, and their relationships defined using an ontology. Negotiators can directly reference issues within their text messages using semantic enrichment. Therefore, misunderstandings and ambiguities are reduced. The aim of pragmatic enrichment is to explicate the sender's intention to be transferred with the negotiation message. Consequently, negotiators are able to specify a message type such as offer, counteroffer, question, clarification, final accept, or final reject for every message sent. The communication support is based on elements of communication theories (Schoop 2005) e.g.: Habermas (1984), and Searle (1969). Document management is implemented to increase clarity of the message exchange and build up trust. Negoisst automatically documents all messages exchanged between negotiators.

2.5 Results

This chapter presents the results of the laboratory experiment firstly describing descriptive results to assess the participants, then presenting measures of construct validity, finally answering the hypotheses.

2.5.1 *Descriptive Results and Construct Validity*

Data cleaning led to a final data set of 110 negotiators in 55 negotiations each consisting of one student from each participating university. 67 participants were female, 42 participants male with one participant not disclosing gender; average age was 24.8 years (SD=1.92). All negotiations were conducted in English.

Computer skills (Igbaria et al. 1995) and (electronic) negotiation skills of the participants were assessed. Actual daily use of computers was reported to be very high. Participants reported well-above negotiation skills (M=4.69, SD=1.13) on a 7-point Likert scale. NSS skills could not be assessed because only 9.1% of participants had used an NSS before.

The assessment of learning styles led to the treatment groups shown in Table 1.

Table 1 Treatment Groups (Matching Combinations Bold)

Treatments	Enactive Training	Vicarious Training	Total
Activists	11	9	20
Pragmatists	15	13	28
Reflectors	20	20	40
Theorists	11	11	22
Total	57	53	110

Manipulation checks showed that both EUTs were perceived significantly different regarding the training methods employed ($t(108)=0.639$, $p<0.001$).

Examining task performance of the negotiations, 45 (81,8%) negotiations led to an agreement. Negotiators reaching an agreement achieved individual utilities from 41% to 69% ($M=54.52\%$, $SD=6.32$). Joint utilities reached from 100% to the Pareto-optimal outcome of 115% ($M=109.04\%$, $SD=3.8$). Resulting in outcomes directly on the Pareto-frontier to agreements having 7.62 percentage points distance to the Pareto-frontier ($M=3.53\%$, $SD=2.9$). Fairness of the agreements ranged from perfectly fair agreements to a contract imbalance of 28 percentage points ($M=8.96\%$, $SD=8.1$).

Appendix A (cf. Table 15) shows the newly developed items for the measurement of the latent individual variables face-to-face (NEGOXP) and e-negotiation skill acquisition (NSSXP). Both constructs were measured using a 7-point Likert scale. An exploratory factor analysis has been performed using principal axis factoring to calculate construct values for the subjective dimensions of interest as they are newly developed. Overall, ten items representing face-to-face negotiation skill acquisition, and electronic negotiation skill acquisition are integrated leading to a Kaiser-Meyer-Olkin-criteria (KMO) of 0.831 showing mediocre relationships in the data set. Two items (NSSXP_3, NEGOXP_4R) had to be excluded during data cleaning. Extraction is performed following Kaiser's criterion to extract all

factors with eigenvalues greater than one leading to two factors representing the theoretical considerations explaining 48.66% of variance (cf. Table 2). Because the constructs used are tightly coupled Oblimin-rotation has been used (Hair et al. 2010).

Table 2 Factor Loadings After Rotation

	Factor	
	1	2
NSSXP_6	.762	-.013
NSSXP_1	.690	.019
NSSXP_4R	.686	.083
NSSXP_2R	.652	-.053
NSSXP_5 (excluded)	.428	-.284
NEGOXP_1	-.028	-.832
NEGOXP_3	-.095	-.740
NEGOXP_5	.113	-.628
NEGOXP_2R (excluded)	.308	-.414
NEGOXP_6 (excluded)	.385	-.403
KMO Measure of Sampling Adequacy	0.831	
Bartlett's Test of Sphericity	$\chi^2=430.794^{***}$	
Within this thesis the following probability values are applied, unless indicated otherwise: *p<0.05, **p<0.01, ***p<0.001		

To evaluate the validity of the multi-item measurement model, we follow the guidelines by Hair et al. (2014). To evaluate discriminant validity, cross loadings and correlations between the factors are assessed. Table 2 shows cross loadings above the 0.200 level for NSSXP_5 as well as NEGOXP_2R and NEGOXP_6. Thus, these items are excluded from further analyses. There is a significant correlation (cf. Table 3) between both factors, representing their theoretical underpinnings as face-to-face negotiation skills are usually a necessary prerequisite to e-negotiation skills (Köszegi and Kersten 2003).

Regarding internal consistency reliability, Cronbach's Alpha and composite reliability show values well above the thresholds of 0.5 (Cronbach 1951) and 0.7 respectively (Nunnally and Bernstein 1994) (cf. Table 3).

Indicator reliability requires factor loadings over 0.400 which are matched by all factors.

Analysing convergent validity, the average variance extracted (AVE) is calculated. AVE is typically assumed to be sufficient if greater than 0.5, meaning that a construct explains more than half of the variance of its indicators. Values are rather low for both constructs assessed leaving e-negotiation skill acquisition below the threshold. Further analyses, therefore, have to be performed with caution.

Table 3 Reliability Measures of Measurement Model Including Transformed R-Matrix

	NEGOXP	NSSXP
Arithmetic Mean	5.18	5.8
Cronbach's Alpha	.759	.783
Composite Reliability	.782	.765
Average Variance Extracted	.525	.473
NEGOXP	1	.624**
NSSXP	.624**	1

2.5.2 Hypotheses Testing

Based on the data described in the previous section, we analyse the hypotheses postulated in section 2.3. Following the explanations before, we assign a dichotomous variable to each participant indicating whether training method and learning style are matching or not. Thus, testing the hypotheses demands comparisons between matching and non-matching groups w.r.t. the dependent variables. Data exploration showed that none of these constructs is normally distributed, thus we apply Mann-Whitney tests to compare the treatment groups leading to the results in Table 4. All p-values provided are 2-tailed.

Table 4 Results of Mann-Whitney Tests Comparing Matching and Non-Matching Conditions

		H1a	H1b
	Individual Outcome	NEGOXP	NSSXP
Median Matching (N=57)	55.0%	5.33	6.00
Median Non-Matching (N=53)	52.5%	5.00	5.75
U	992.50	1288.00	1132.50
Significance level	p=0.876	p=0.185	p=0.023
Effect Size	r=0.015	r=0.127	r=0.216*

These tests show a non-significant increase in individual utility and face-to-face negotiation skill acquisition between non-matches and matches. While we expected no effect regarding individual outcomes, we have to reject hypotheses 1a since a matching training method and learning style did not increase face-to-face negotiation skill acquisition significantly. However, the data shows that negotiators with matching training method and learning style have a significantly higher e-negotiation skill acquisition than negotiators without such matching representing a small effect. Thus, we can support hypothesis 1b. However, the analysis of construct validity above led to concerns evaluating electronic negotiation skills because of very low convergent validity.

For further evaluations of the effects of training method and learning style, the two independent variables underlying the matching, training method, and learning style are analysed. Thus, a two-way independent analysis of variance (ANOVA) is conducted to assess main and interaction effects indicating a relationship between the training method and e-negotiation skill acquisition. However, no significant main effects of learning style, training method, or interaction effects are found including covariates such as gender, age, native language, university, or previous computer usage. To evaluate our hypotheses, contrasts were defined to compare practical to theoretical learning styles and activists to pragmatists respectively reflectors to theorists also showing no significant differences. Regarding the effect sizes, training method and learning style have an equally small effect on e-negotiation skill acquisition. Effect sizes get to almost zero analysing the effect on individual utility.

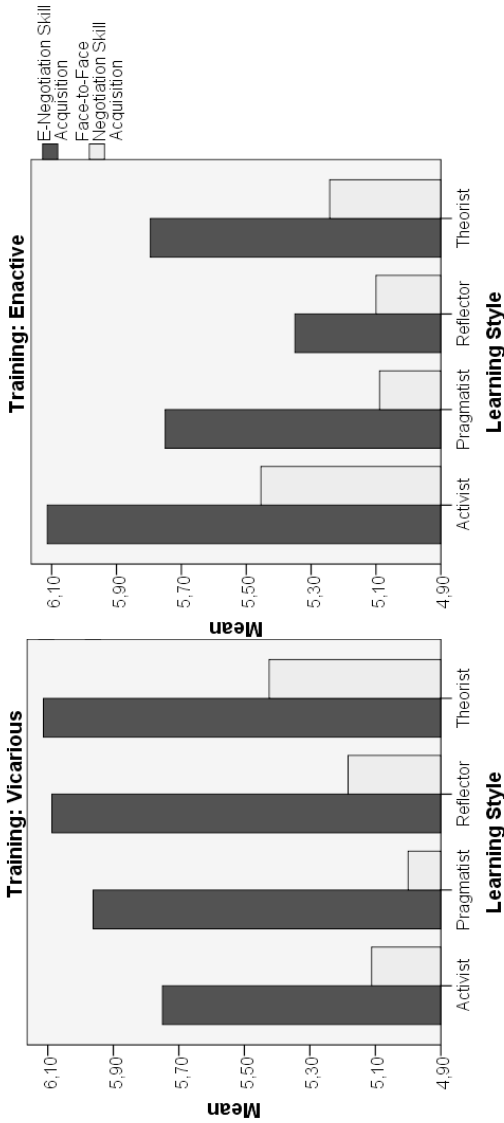


Figure 8 Skill Acquisition for Learners with Enactive and Vicarious Training

Although ANOVA is a rather robust method to deal with non-normally distributed variables, e-negotiation skill acquisition has been analysed further applying a Mann-Whitney test to assess the assumed differences between both training methods precisely. Negotiators attending the vicarious training achieve higher e-negotiation skill acquisition (Mdn = 6.00) compared to negotiators attending the enactive training (Mdn = 6.00, $U=1267.50$, $p=0.147$, $r=0.139$). Figure 8 shows that e-negotiation skill acquisition (Mdn = 6.00) in general was higher than face-to-face negotiation skill acquisition (Mdn = 5.33) and confirms our underlying matching assumption. Practical learning styles mostly report higher skill acquisition attending the enactive training, while theoretical learning styles report higher skill acquisition attending the vicarious training leading to an idealistic V-shape over both diagrams in Figure 8. The assumed linear trend is diluted by learners preferring the opposite style in both briefings (i.e. theorists in the enactive training and activists in the vicarious training) which report slightly higher skill acquisition than their neighbouring styles.

Proceeding to hypotheses 2 - 4, dyadic variables are analysed. An explorative investigation reveals that none of the dependent variables is normally distributed. Thus, non-parametric tests are applied. We distinguish between dyads where none of the negotiators received a matching negotiation training, mixed dyads where one negotiator received a matching training, and dyads where both negotiators received matching trainings. Table 5 shows median values for our measurement variables demonstrating slightly improving effects for joint utility and contract imbalance the more matching negotiators are involved. According to the negotiation dilemma, the better the agreements get, the harder it is to achieve an agreement, leading to a decrease in the agreement rate.

Table 5 Comparison of Medians Across Matching Combinations for Dyadic Variables (*Agreements Only)

	H2	H3a	H3b	H4
Matching/Dependent Variables	Agreement Rate	Joint Utility*	Distance to Pareto-frontier*	Contract Imbalance*
None (N=11)	84.6%	108.0%	3.0pp	8.0pp
One (N=22)	81.5%	110.0%	3.0pp	5.5pp
Both (N=12)	80.0%	111.0%	3.0pp	5.0pp

Matching trainings and learning styles have no effect on the agreement rate ($\chi^2(2)=0.104, p=0.949$). Also, the underlying variables learning style and training method show no effect if evaluated separately. Thus, hypothesis 2 is not supported.

Detailed data analysis of negotiation efficiency is performed using a Kruskal-Wallis test. Regarding joint utility ($H(2)=2.393, p=0.303$) and the distance of an agreement to the Pareto-frontier ($H(2)=0.937, p=0.626$), no significant effects of personalised trainings can be found. Thus, hypotheses 3a and 3b are not supported. However, median values (cf. Table 5) and means (cf. Figure 9) confirm the matching assumption showing increasing joint utility the more matches are involved and decreasing distance to the Pareto-optimal agreement.

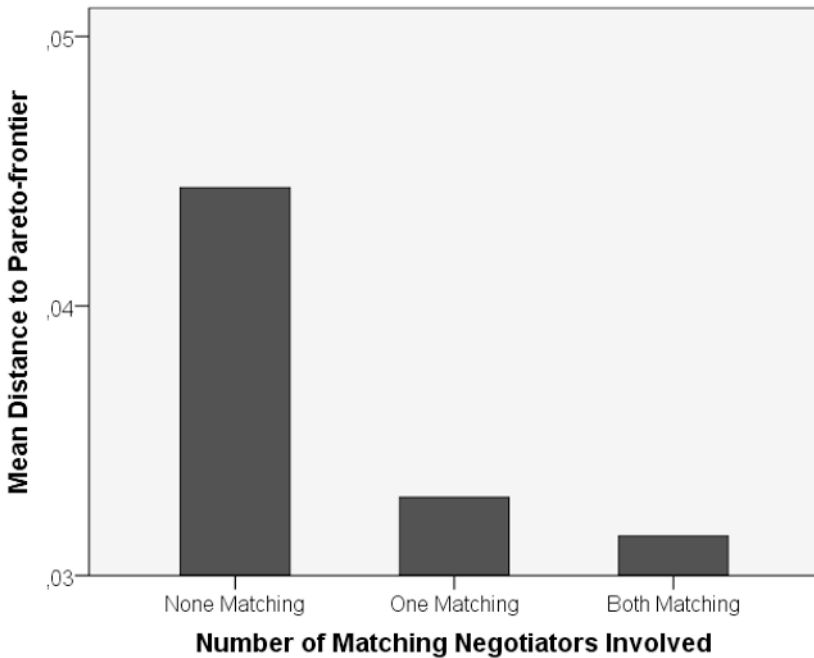


Figure 9 Average Distance to Pareto-Frontier on Number of Matching Negotiators per Negotiation

Again, combinations of training methods, learning styles and interaction effects are analysed in negotiation dyads using a two-way independent

ANOVA. To keep group sizes large, only equal versus unequal combinations of training methods and practical versus mixed versus theoretical combinations of learning styles are analysed. Because group sizes are unequal η^2 is calculated to report effect sizes (Levine and Hullett 2002). However, the data reveals no effect of learning styles or interaction effect, but a significant effect of the combination of training methods on joint utility ($F(1,39)=5.633$, $p=0.023$, $\eta^2_{\text{training method}}=0.00014^*$) and distance to the Pareto-frontier ($F(1,39)=6.846$, $p=0.013$, $\eta^2_{\text{training method}}=0.055^*$).

Regarding joint utility and the distance to the Pareto-frontier, the data confirms the matching assumption (cf. Figure 10). Negotiation dyads containing practical negotiators achieve more efficient agreements when they attended the enactive trainings. Negotiation dyads containing theoretical negotiators achieve more efficient agreements when they attended the vicarious trainings. Dyads with mixed combinations of learning styles or training methods achieve mediocre agreements leading to the least efficient agreements where both negotiators attended identical trainings respectively learning styles.

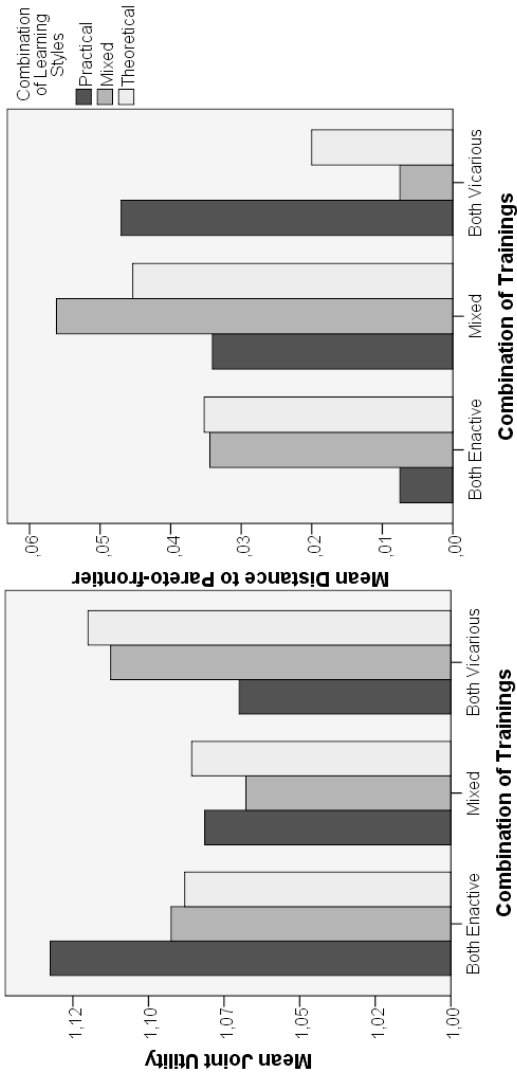


Figure 10 Average Joint Utility and Distance to Pareto-Frontier on Combinations of Training Methods

Analysing the differences between enactive and vicarious trainings alone a one-way ANOVA is conducted to assess the effect of combinations of training methods on joint utility and the distance to the Pareto-frontier. However, ANOVA, often described as a robust method (Field 2013), disregards the not normally distributed data for the variables of interested, thus results have to be interpreted carefully. The analysis reveals a non-significant effect of the combinations of training methods on joint utility, $F(2,44)=3.054$, $p=0.058$, $\eta^2=0.127$. Table 6 shows that negotiation dyads attending different trainings achieve less efficient negotiation agreements while dyads where both negotiators attended the same training achieve more efficient agreements. The difference between completely enactive and vicarious dyads, however, is marginal.

Analysing the distance to the Pareto-frontier, a significant main effect of the combinations of trainings is revealed, $F(2,44)=3.845$, $p=0.029$, $\eta^2=0.155^*$. The Games-Howell post-hoc test shows no significant difference between a combination of enactive trainings and mixed trainings. However, dyads of vicarious trainings achieve a significantly lower distance to the Pareto-frontier ($p=0.039$) leading to more efficient agreements.

Overall, negotiation dyads with equal trainings are more efficient compared to dyads with mixed trainings regardless of the type of training. This effect is stronger than the effect of matching learning styles and training methods regarding its size.

Table 6 Medians across End-User Training Combinations for Dyadic Variables (* Agreements Only)

EUT/Dependent Variables	Agreement Rate	Joint Utility*	Distance to Pareto-frontier*	Contract Imbalance*
Both enactive (N=13)	86.7%	111.0%	3.0pp	7.0pp
Mixed (N=23)	85.2%	108.0%	5.8pp	7.0pp
Both vicarious (N=9)	69.2%	111.0%	3.0pp	7.0pp

In accordance with the ANOVA, comparing the effects of learning style, training method, and relevant interaction effects, the analysis of learning

styles reveals no further effects on joint utility or the distance to the Pareto-frontier.

Regarding the hypothesised positive effect of matching learning style and training method on the fairness of the agreements measured by contract imbalance the data reveals no significant effect ($H(2)=4.355$, $p=0.113$) which leads us to reject hypothesis 4. Follow-up analyses (Bonferroni correction is marked by plus-sign $^+$) showed a slight increase in fairness of the negotiated agreements from non-matching dyads to dyads with one matching negotiator ($Mdn_{none}= 0.080$, $Mdn_{mixed}= 0.055$, $U=75.00$, $p=0.246^+$, $r=0.308$) as well as from dyads with one matching negotiator to all-matching dyads ($Mdn_{mixed}= 0.055$, $Mdn_{both}= 0.050$, $U=128.50$, $p=0.899^+$, $r=0.022$) leading to a medium improvement of negotiation fairness comparing non-matching with all-matching negotiation dyads ($Mdn_{none}= 0.080$, $Mdn_{both}= 0.050$, $U=34.00$, $p=0.153^+$, $r=0.414$). A two-way-independent ANOVA did not reveal further main or interaction effects of contract imbalance on learning styles or training methods.

2.6 Discussion

Although most effects are statistically insignificant, the assumed tendencies for all hypotheses exist, mostly supporting our theoretical argumentation integrating learning styles, negotiation styles, and behaviour. The data shows that negotiators preferring theoretical learning styles on average follow an avoiding negotiation style with some competitive behaviour leading to fewer but more efficient and fairer agreements exchanging few messages. Negotiators with practical learning styles behaved more cooperative or accommodating leading to a high amount of less efficient and unfair agreements exchanging numerous messages. In such dyads especially, practical negotiators were exploited by their counterparts leading to lower individual utilities. In contrast to our argumentation based on Ma et al. (2012), practical negotiators achieve lower individual outcomes being less assertive than expected compared to theoretical negotiators.

Regarding hypotheses 1a and 1b, there is a strong tendency that personalised trainings enable negotiators to acquire e-negotiation skills more easily (cf. Table 7). This effect is stronger for e-negotiation skill acquisition than for face-to-face negotiation skill acquisition, which might be due to the focus of the EUT on e-negotiations. Matching training methods and learning styles neither affect negotiation effectiveness, efficiency nor fairness leading us to reject hypotheses 2 – 4. Nevertheless, the data confirms our

description of strengths and weaknesses of the different learning styles showing tendencies that negotiators with a matching training by tendency achieved fairer negotiation agreements. In contrast to our argumentation in section 2.3.2, the increased number of messages in practical dyads did not hinder but improve efficiency. The data shows an even stronger effect of equal trainings or equal learning styles leading to more efficient outcomes. Using the SVO to explain our results means that practical negotiators use more relationship-focused tactics aiming for cooperation, whilst theoretical negotiators use a mix of relation and task-oriented tactics (Olekals and Smith 1999). Combining two negotiators of the same style produces an equally efficient dyad, while mixing both approaches leads to a strong focus on task-orientation, which is less efficient regarding negotiation outcomes.

Table 7 Summary of Hypotheses

	Evaluation	Significance level	Effect size	Follow-up
H1a	Not supported	p=0.185	r=0.127	-
H1b	Supported	p=0.023	r=0.216*	-
H2	Not supported	ns	V=0.043	-
H3a	Not supported	ns	$r_{\text{none/both}}=0.318$	Equal trainings better ($\eta^2=0.127$)
H3b	Not supported	ns	$r_{\text{none/both}}=0.191$	Equal trainings better ($\eta^2=0.155^*$)
H4	Not supported	p=0.113	$r_{\text{none/both}}=0.414$	Comparing none/both matching (r=0.414)

Firstly, this study confirms the assumption that a matching between learning style and training method improves acquisition and application of skills. Secondly, it shows a strong impact of the coordination of such styles and training methods in negotiations as collaborative work processes making negotiation dyads with equal trainings or learning styles more efficient.

In line with previous research (Gupta and Anson 2014; Ben-Yoav and Banai 1992; Robey and Taggart 1983), the effects of individual differences

or learning styles as a measure of individual differences are very small and often superposed by other influences, e.g. culture. Besides their volatile effects, learning styles (especially the LSQ) are also intertwined with theories on culture sharing similar constructs e.g. the dimension of assertiveness closely-related to uncertainty tolerance in culture studies (Hofstede 1984).

There is also an effect of habituation to prevalent training methods. Since theoretical teaching is the standard at both participating universities the vicarious training leads to higher skill acquisition, although, according to the literature, there is no superior training method in general (Gupta et al. 2010). The superiority of equal training methods or learning styles over mixed ones confirms the findings of other studies that learning styles often influence learning outcomes rather by interaction effects with the training method than directly (Gupta and Anson 2014). In negotiations such effects can be explained focusing on the contents of the trainings, or simply the familiarity:

- 1) Training method and learning style could influence the negotiation behaviour facilitating either a relationship-oriented or task-oriented negotiation strategy making equal dyads more efficient (Olekalns and Smith 1999).
- 2) Simply the familiarity with the partners' behaviour could lead to a mutual understanding when negotiating with a counterpart that attended an identical training or prefers the same learning style reducing the cognitive load required to encode such behaviour (Sweller 1994).

The present study is limited by the small sample size (i.e. 110 negotiators in 55 negotiation dyads) especially if splitting the sample into groups according to their training method or learning style becomes necessary, restricting the statistical methods that can be used. Another limitation is the specific distribution of learning styles in the dataset as the sample is not distributed equally among all four learning styles (Allinson and Hayes 1988). Furthermore, we only used the most preferred learning style of each participant disregarding the interval-scaled preference values produced by the LSQ (Duff and Duffy 2002). Although previous studies on training methods found effects performing similarly short 2-hour trainings (Thompson 1990), the analysis of learning styles obviously requires a large amount of

dedicated training to induce effects compared to predominant conceptions of learning acquired over a semester or even several years of studies. The time-period of about one week between the trainings and the subsequent negotiation as well as the group work performed in the enactive training bringing together learners with different styles, might have blurred the findings making it hard to bridge the distance between personalised learning and the application of this knowledge, consequently diminishing effect sizes.

2.7 Conclusion

The current paper provides an application of theories of personalised EUTs to the domain of NSSs. Following its research aim, two personalised EUTs have been developed and evaluated addressing individual learning styles by providing matching training methods. The approach can be generalised to NSSs per se and even to ISSs. The personalised trainings have been evaluated performing a negotiation experiment. However, similar to existing research on individual differences in various domains, the effects of such differences are often small. Effects of personalised EUTs on acquisition of electronic negotiation skills, negotiation efficiency, and fairness of the agreements could be measured. Training methods have stronger effects on the outcome variables measured than learning styles. Also, negotiations with partners who received an identical training or prefer the identical learning style have been found to be more efficient.

This implies for practitioners that knowing your own style as well as your negotiation partner(s)' style(s) affects negotiation outcomes. The effects of learners being informed of their individual learning style need to be analysed following management education, where personal styles are deliberately used to induce processes of self-reflection (Shell 2001).

Implications for researchers include the improvement of the experimental procedure, and a greater focus on SCT facilitating social and/or cognitive aspects. Firstly, researchers carefully need to adapt and improve the experimental procedure to be able to identify moderating variables for explaining the connection between learning styles and negotiation styles taking into account their common ancestors. One possibility to strengthen the connection between learning styles and negotiation styles is to adapt the LSQ instrument to the domain of negotiations. As individual differences are dynamic constructs being hard to measure, a more domain specific

questionnaire can be promising. Secondly, a greater focus on social aspects needs to switch the object of analysis from negotiation dyads to group decision-making or computer-supported collaborative work processes including more than two participants. However, this poses several challenges regarding sample size, moderating variables and matchings of learning styles and training methods. Finally, a greater focus on the cognitive aspects can also mean a change of the object of analysis investigating personalised learning from a task perspective. Cognitive theories, such as cognitive load (Sweller 1988) or cognitive fit (Vessey 1991) usually investigate the mental representation of problem solving tasks similar to learning processes. Thus, analysing learning or negotiation tasks on a more granular level could be a promising avenue being able to observe actual task-related behaviour of participants instead of measuring their potentially biased perceptions. However, such analyses require an extension of cognitive theories from the individual level to at least bilateral processes. First steps into this direction have been reported extending cognitive fit to inter-dependent tasks (Shaft and Vessey 2006).