

A theory-based measure of conflict management strategies in the workplace

CARSTEN K. W. DE DREU^{1*}, ARNE EVERS¹, BIANCA BEERSMA¹
ESTHER S. KLUWER² AND AUKJE NAUTA³

¹ *University of Amsterdam, Amsterdam, The Netherlands*

² *Utrecht University, Utrecht, The Netherlands*

³ *University of Groningen, Groningen, The Netherlands*

Summary

Conflict management influences individual wellbeing, group performance and organizational effectiveness. This research examined the psychometric qualities of two versions of the newly developed test for conflict handling. The lean version (Study 1 and 2) included problem solving, forcing, yielding and avoiding as distinct conflict management strategies, and the expanded version (Study 3) also included compromising. A negotiation study (Study 1) showed substantial convergence between self-reports, opponent-reports and observer rated behavior for problem solving, forcing and yielding, but not for avoiding. In Study 2 and Study 3 the psychometric properties were examined of the lean and the expanded version, respectively. Confirmatory factor analyses revealed good to excellent psychometric qualities of both versions of the scale. We conclude that the scale is a parsimonious, flexible and valid instrument to assess conflict management strategies at work. Copyright © 2001 John Wiley & Sons, Ltd.

Introduction

The effectiveness of individual employees, teams and entire organizations depends on how they manage interpersonal conflict at work (Tjosvold, 1998). Managers spend an average of 20 per cent of their time managing conflict (Thomas, 1992), and evidence suggests conflict and conflict management at work substantially influences individual, group and organizational effectiveness, as well as wellbeing, as indicated by health complaints and doctor visits (De Dreu *et al.*, 1999; Spector and Jex, 1998). Given the importance of conflict management in organizations, it is vital to have and develop reliable and valid measurement instruments. Such instruments help researchers to obtain valid data through self and peer-report, and practitioners to diagnose conflict management strategies at work. Unfortunately, the measurement instruments that have been described in the literature either suffer from low psychometric quality, or the psychometric quality is unknown. The present research was designed

* Correspondence to: Carsten K.W. De Dreu, University of Amsterdam, Department of Psychology, Roetersstraat 15, 1018 WB Amsterdam, The Netherlands.
E-mail: ao_dedreu@macmail.psy.uva.nl

to assess the psychometric qualities of a revised and updated version of the Dutch Test for Conflict Handling (DUTCH) designed by Van de Vliert (1997). The test has been developed by Dutch scholars but is not necessarily applicable only to people from the Dutch culture. As we will elaborate upon below, the theoretical basis for the test generalizes across culture and the original test corresponds closely with tests developed in the United States (Van de Vliert, 1997).

As an outline, we first discuss the theoretical basis underlying the instrument, and we discuss several conflict management tests that have been described in the literature and preceded the DUTCH. Subsequently, we report three studies designed to assess the psychometric qualities of the DUTCH. In Studies 1 and 2 we examined a 'lean' version of the DUTCH which measures problem solving, forcing, yielding and avoiding. In Study 3 we examined an 'expanded' version which includes compromising as a distinct strategy. We conclude with a discussion of some practical and theoretical implications of the results.

Conflict management at work: dual concern theory

Conflict management is what people who experience conflict intend to do as well as what they actually do (Van de Vliert, 1997). Although an infinite number of conflict management strategies may be conceived of, conflict research and theory tends to converge on Dual Concern Theory (Pruitt and Rubin, 1986). Dual Concern Theory is related to earlier work by Blake and Mouton (1964) and to Deutsch's Theory of Cooperation and Competition (Deutsch, 1973). It argues that conflict management is a function of high or low concern for self, combined with high or low concern for others. As Figure 1 shows, high concern for self and low concern for others results in a preference for *forcing*, focused on imposing one's will on others. Forcing involves threats and bluffs, persuasive arguments, and positional commitments. Low concern for self and high concern for others results in a preference for *yielding*, which is oriented towards accepting and incorporating others will. It involves unilateral concessions, unconditional promises, and offering help. Low concern for self and others results in a preference for *avoiding*, which involves reducing the importance of the issues, and attempts to suppress thinking about the issues. High concern for self and others produces a preference for *problem solving*, which is oriented towards an agreement that satisfies both own and others' aspirations as much as possible. It involves an

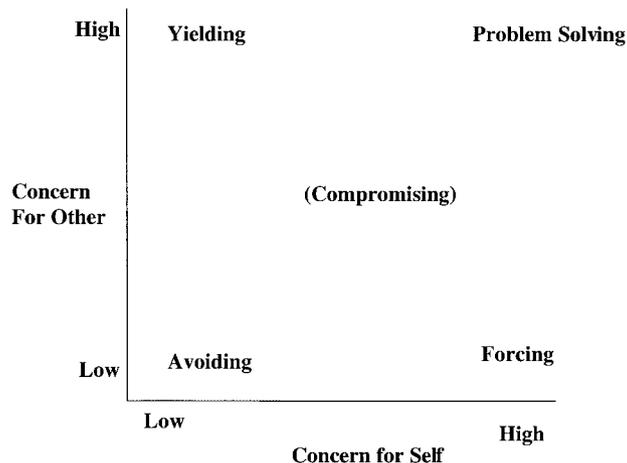


Figure 1. Theoretical representation of the five conflict management strategies as a function of concern for self and concern for other

exchange of information about priorities and preferences, showing insights, and making trade-offs between important and unimportant issues.

Recently, some authors have suggested that intermediate concern for self, paired to intermediate concern for others results in a preference for *compromising*. Some see compromising as 'half-hearted problem solving' (e.g., Pruitt and Rubin, 1986). Others, however, see it as a distinct strategy that involves the matching of others' concessions, making conditional promises and threats, and an active search for a middle ground (e.g., Van de Vliert, 1997). Rather than seeking to settle this debate at the theoretical level, we choose to test two versions of the DUTCH. The 'lean' version includes problem solving, forcing, yielding and avoiding (Studies 1 and 2); the 'expanded' version (Study 3) includes compromising as well. Doing so yields information about the psychometric properties of two related measurement scales. In addition, Study 3 will provide some empirical arguments for or against the conceptualization of compromising as a distinct conflict management strategy.

Conflict management tests

Dual Concern Theory has received good support in field research in organizations (Blake and Mouton, 1964; Thomas, 1992; Van de Vliert, 1997) as well as in experimental research in the social psychological laboratory (Carnevale and Pruitt, 1992; De Dreu *et al.*, 2000). As such, the theory provides a solid basis for the development of instruments to assess conflict management strategies at work. Several such instruments exist. One of the oldest methods is the Conflict Measurement Survey (e.g., Kilmann and Thomas, 1977), but it has been criticized and replaced by other measures because of disappointing psychometric qualities (Landy, 1978; Thomas and Kilmann, 1978; Shockley-Zalabak, 1988). Substantial improvement was reached by the development of the Rahim Organizational Conflict Inventory (ROCI-2). The instrument comes in three forms, one concerned with conflicts with one's supervisor (Form A), one concerned with conflicts with one's peer (Form B), and one concerned with conflicts with one's subordinates (Form C). In each case the instrument measures the five conflict management strategies discussed above.

Rahim and Magner (1995) conducted confirmatory analysis of data from one student and four professional samples, and showed convergent and discriminant validity of the five sub-scales of measuring conflict management. Close inspection of the goodness-of-fit (GFI) indices in both student and professional samples suggests moderate fit falling below the standard cut-off criterion of 0.90. Satisfactory fit was reached only when within each sub-scale items were aggregated into two sets (Rahim and Magner, 1995, p. 126). Although this procedure is statistically and methodologically correct, it makes the instrument unfit for applied purposes in which one wishes to quickly and unequivocally answer the question which conflict management strategy respondents use within a particular setting. Thus, the ROCI-2 is widely used but it suffers from a number of disadvantages including less than optimal psychometric properties.

To redress these shortcomings, Van de Vliert and colleagues developed a test for conflict handling (Euwema and Van de Vliert, 1990; Janssen and Van de Vliert, 1996; Van de Vliert, 1997). In interactive sessions with focus groups, new items were designed and items derived from the ROCI-2 and other instruments were revised and adapted up to a point where the coefficient alphas and patterns of inter-correlations were sufficient to good (Van de Vliert, personal communication, June 14, 1999). Compared to the ROCI-2, the DUTCH has fewer items (16 or 20 instead of 28), which is important when we want to measure conflict management as part of a large organizational survey and need as short a measure as possible. Also, the DUTCH leaves the hierarchical relationship between conflict parties unspecified, which increases the investigator's flexibility.

The problem solving (forcing) scale of the DUTCH is positively (negatively) related to integrative agreements in group negotiation (Beersma and De Dreu, 1999). However, we have no information about the convergence between self and other reports of conflict management strategies, or between self-reports and actual conflict behavior. Study 1 was designed to fill this void and examined the convergent validity of the DUTCH by comparing self-ratings of forcing, problem solving, yielding and avoiding during a negotiation task with ratings by one's opponent and with observer ratings of conflict behavior. Also, Study 1 assessed the extent to which self-reports are susceptible to self-serving bias – the tendency to see one's own conflict management as more constructive and less destructive than the conflict management of one's opponent (De Dreu *et al.*, 1995).

In addition, the psychometric qualities of the DUTCH are unknown. To fill this void, we assessed in Study 2 the psychometric qualities of the lean version of the DUTCH. Study 3 was designed to assess the psychometric qualities of the expanded version of the DUTCH (including compromising as a distinct strategy). In Studies 2 and 3, we focused on (1) the unidimensionality of the four or five sub-scales, (2) the discriminant validity, and (3) the invariance across gender and hierarchical level.

STUDY 1

Method

Participants and procedure

Seventy eight psychology students (29 males and 49 females) at the University of Groningen participated in this study. They were randomly assigned to dyads. The mean age of the participants was 22 years, ranging from 19 to 26 years. Initial analyses revealed no differences between male and female participants.

Participants came to the laboratory in groups of four and care was taken that participants in one session were unacquainted. As in our past research (De Dreu *et al.*, 1998, 1995 – Study 3), participants were seated in separate rooms and had 10 minutes to read their role instructions (see below). They were to imagine that they were in the described situation, and to prepare a conversation with another participant. Hereafter, participants were paired and seated in separate rooms where they engaged in an audiotaped negotiation (see below). After 15 minutes, the experimenter entered the room, and handed out a questionnaire. Upon completion of the questionnaire, participants were debriefed and dismissed.

Negotiation task

The study employed a role playing methodology that was developed in a pilot study and was based on our past research (e.g., De Dreu *et al.*, 1998, 1995 – Study 3). Participants were provided with background information in which a conflict situation was described and then freely interacted with each other to discuss the issue. The instructions stated that the participant works together with a fellow student on a research project. The original schedule of activities for the next week is that both students do statistical analyses together but that this original schedule is no longer applicable and that

they need to reach an agreement about how to change the schedule of activities. Thus, members within one dyad needed to reach an agreement about who would do what kind of activity the next week. Through instructions, parties were given opposed preferences for certain activities and they were given arguments they could use to defend their particular preferences. Participants were told, finally, that they had 15 minutes to discuss their opposing preferences and to reach an agreement on a new schedule of activities. (In contrast to some of our past research, participants were not given a pay-off schedule indicating the value of a particular agreement. Rather, they were told what agreements they preferred and what agreements they did not prefer. As a result, the study did not yield objective performance data).

Dependent variables

Self-report and opponent-report measures

In the post-negotiation questionnaire, *own conflict management* was measured with the DUTCH. The instrument comprised 16 items, with four (randomly ordered) items per conflict management strategy (forcing, problem solving, yielding, and avoiding; see Appendix A). Questions could be answered on 5-point scales, with 1 = not at all, to 5 = very much). Cronbach's alphas were 0.86 for forcing, 0.81 for problem solving, 0.71 for yielding, and 0.69 for avoiding. In addition, we asked participants to fill out the DUTCH with regard to their opponent's conflict management. Cronbach's alphas were 0.83 for forcing, 0.82 for problem solving, 0.73 for yielding, and 0.67 for avoiding. The order in which own and others' conflict management was assessed was varied systematically. Because it had no effects it is not discussed any further.

Observer measures

The negotiations were audiotaped and subsequently coded by two trained observers unaware of the goals of the study. The trained observers independently rated the conflict behaviors of each of the two parties within a dyad. Using electronic beeps, the 38 audiotaped conversations were divided into time samples of two minutes ($n = 212$ time samples, $M = 5.4$ time samples per dyad). Every two-minute interval, the observers rated four *conflict behaviors* (problem solving, forcing, yielding, and avoiding; 1 = *demonstrated not at all*, to 4 = *demonstrated to a great extent*). Inter-observer reliabilities were sufficient to good, with Cronbach's alphas ranging from 0.61 to 0.81 for forcing. Two exceptions were the interrater reliabilities for yielding ($\alpha = 0.53$) and for avoiding ($\alpha = 0.32$). An explanation is that both constructs had low variance ($SD = 0.49$ and $SD = 0.16$ respectively). When looking at absolute reliability, it appeared that 141 out of 212 times (67 per cent) observers agreed upon yielding and that 200 out of 212 times (94 per cent) observers agreed upon avoiding (Cohen's $K_s > 0.67$). We conclude that interrater reliabilities for the four scales were sufficient to good.

Results

Within each dyad we had observer ratings, and self and other reports for each party (further referred to as Party A and Party B) on each of the four sub-scales from the DUTCH. Since parties interacted their data were interdependent and we decided to analyse the data for each party independently and to treat data for Party B as a replication of data for Party A. This is a conservative approach because it reduces

our degrees of freedom by half. It is, however, justified in light of the fact that in the negotiation Party A and Party B were given different positions with different arguments.

Convergent and divergent validity

The upper part of Table 1a gives the means, standard deviations, and inter-correlations between observer ratings of Party A and opponent-ratings of Party A on the one hand, and self-reports by Party A on the other. The lower part of Table 1a gives the same information with regard to Party B. Before discussing observed correlations, we wish to emphasize that moderately negative or moderately positive correlations may be expected, theoretically, between different sub-scales because they both load high on one dimension (e.g., concern for self) and low on another dimension (e.g., concern for self). For example, problem solving may be positively correlated with yielding (both share a high concern for other), while forcing and yielding may be expected to correlate negatively (they differ both on concern for self and concern for other). In other words, we expected strong positive correlations on the diagonal in Table 1a, and sometimes moderately negative, or moderately positive correlations off the diagonal in Table 1a.

As can be seen in Table 1a, self-reported forcing was positively and strongly correlated with observer ratings of forcing and with opponent-ratings of forcing. Moreover, self-reported forcing was negatively related with the other conflict management strategies rated by observers or the opponent. This suggests that self-reported forcing has high convergent and divergent validity. A similar but somewhat weaker pattern emerged for problem solving. Again, self-reported problem solving had strong positive correlations with observer ratings and opponent ratings of problem solving, and positive but weaker correlations with yielding. Interestingly, problem solving and avoiding were positively, but not significantly, correlated. This may be understood in terms of Dual Concern Theory, where problem solving is the result of high dual concern, and avoiding the result of low dual concern. Thus, problem solving tends to have good convergent and acceptable divergent validity.

With regard to self-reported yielding, data are supportive of convergent validity, in that self-reported yielding is positively correlated with observer ratings and opponent ratings of yielding behavior. One exception to this is that self-reported yielding correlated as positive with observer ratings for yielding as with observer ratings for problem solving, suggesting that observers have difficulty separating mere concession making from problem solving behavior. This can be understood when we realize that in negotiation, problem solving also involves logrolling – making small concessions on important issues and large concessions on unimportant issues.

Table 1a shows, finally, that avoiding had poor convergent validity. Both for Party A and for Party B data, self-reported avoiding did not correlate with observer ratings and with opponent ratings of avoiding. Most likely, the lack of convergent and divergent validity is due to the fact that avoiding behavior is difficult to observe from audiotaped conversation. We return to this in the Conclusion and General Discussion section.

Besides correlations between self-report and opponent-report and observer report, it may be useful to examine correlations between the sub-scales for self-reports. Table 1b provides these. As can be seen, the pattern of intercorrelations closely resembles those reported in Table 1a. For both Party A and B, problem solving and yielding, problem solving and avoiding, and yielding and avoiding were not related. For both Party A and Party B, forcing and problem solving were negatively and significantly related, and forcing and yielding were negatively but not significantly related. Somewhat troublesome is the strong negative correlation between forcing and avoiding for the Party A data, which were not replicated in the Party B data, and was not present in Table 1a either. This may reflect measurement problems related to the avoiding sub-scale.

Table 1a. Means, standard deviations for self-reported conflict management, and correlations between self-report, observer ratings and opponent ratings for conflict behaviors; party A (top panel) and Party B (bottom panel)

| | <i>M</i> | <i>SD</i> | Forcing(Ob) | Forcing(Op) | ProbSol(Ob) | ProbSol(Op) | Yield(Ob) | Yield(Op) | Avoid(Ob) | Avoid(Op) |
|-----------------|----------|-----------|-------------|-------------|-------------|-------------|-----------|-----------|-----------|-----------|
| Forcing | 3.28 | 1.36 | 0.72* | 0.33† | -0.55* | -0.45* | -0.38† | -0.51* | -0.26 | 0.11 |
| Problem Solving | 3.22 | 1.24 | -0.45* | -0.36† | 0.45* | 0.47* | 0.17 | 0.39† | 0.15 | -0.27 |
| Yielding | 2.97 | 0.97 | -0.03 | -0.41* | 0.36† | 0.20 | 0.38† | 0.38† | 0.14 | -0.25 |
| Avoiding | 1.72 | 0.96 | -0.40* | -0.11 | 0.33† | 0.22 | 0.25 | 0.25 | -0.01 | 0.03 |
| Forcing | 2.90 | 1.41 | 0.41* | 0.31† | -0.38† | -0.22 | -0.31 | -0.17 | -0.16 | -0.19 |
| Problem Solving | 3.55 | 1.43 | -0.18 | -0.43* | 0.42* | 0.54* | 0.17 | 0.12 | 0.20 | 0.15 |
| Yielding | 2.97 | 1.05 | -0.43* | -0.46* | 0.46* | 0.35† | 0.39† | 0.46* | 0.12 | 0.12 |
| Avoiding | 1.91 | 1.07 | 0.01 | -0.23 | -0.17 | -0.06 | -0.25 | 0.06 | -0.11 | 0.12 |

Note: * $p < 0.01$; † $p < 0.05$ (two-tailed, with $n = 38$; (Ob) = observer ratings; (Op) = opponent ratings.

Table 1b. Correlations among self-report conflict management strategies for Party A (above the diagonal) and Party B (below the diagonal)

| | Forcing | Problem solving | Yielding | Avoiding |
|-----------------|---------|-----------------|----------|----------|
| Forcing | – | – 0.47* | – 0.23 | – 0.61* |
| Problem solving | – 0.54* | – | 0.29 | 0.04 |
| Yielding | – 0.32 | 0.35 | – | 0.29 |
| Avoiding | 0.08 | – 0.16 | 0.13 | – |

Note: * $p < 0.001$, with $n = 38$.

Table 2. Means for conflict management as a function of target of judgment

| | Conflict management | | | |
|--------------------|---------------------|-------------------|-------------------|-------------------|
| | Forcing | Problem solving | Yielding | Avoiding |
| Target of Judgment | | | | |
| Self | 3.09* [†] | 3.38* | 2.97 [†] | 1.81 [‡] |
| Other | 3.12* [†] | 2.98 [†] | 2.91 [†] | 1.82 [‡] |

Note: *, [†], [‡] means that do not share the same superscript differ at $p < 0.01$ according to paired t -tests ($df = 37$).

Self-serving bias in self-reports of conflict management strategies

To assess self-serving bias in self-reported conflict management we conducted an Analysis of Variance with Target of Judgment (self or opponent) and Conflict Management (forcing, problem solving, yielding, avoiding) as within-participant variables. Results revealed significant main effects for Target of Judgment, $F(1, 37) = 66.11$, $p < 0.001$, and for Conflict Management, $F(3, 35) = 11.50$, $p < 0.001$, as well as a significant interaction between Target of Judgment and Conflict Management, $F(3, 35) = 12.77$, $p < 0.001$. Cell means are given in Table 2. Paired t -tests revealed no effects for Target of Judgment (self versus opponent) on forcing, yielding or avoiding, all $t(37) < 1$, *n.s.* For problem solving, however, self-ratings were higher than opponent ratings, $t(37) = 3.60$, $p < 0.001$. Thus, there is evidence for self-serving bias for problem solving, but not for forcing, yielding and avoiding.

It should be noted that evidence for self-serving bias in the perception of problem solving not necessarily means lack of convergent validity between the self-report and opponent report measures. Convergent validity is assessed on the basis of correlations, which were high and positive (*cf.*, Table 1a), while self-serving bias is assessed by comparing means (*cf.*, Table 2). What we can conclude is that although the participant and the opponent converge in their conclusion that self engages in more problem solving, participants rate the *amount* of own problem solving as higher than does the opponent.

STUDY 2

Study 1 showed acceptable convergence between self, opponent and observer ratings of forcing and problem solving, to some extent for ratings of yielding, but not for ratings of avoiding. Self-reports for yielding and avoiding had moderate to poor convergent and divergent validity and this may be due to the fact that these sub-scales of the DUTCH have poor psychometric properties. Study 2 was conducted to assess the psychometric qualities of the DUTCH. We focused on (1) the unidimensionality of the four sub-scales, and (2) the discriminant validity.

Contextual Sidebar

Organizational Context for Study 2

Organization

The site concerns one of the most profitable business units of a large manufacturing organization producing heavy machinery. At the time of the study (1999), the manufacturing organization's stock value is substantially undervalued and the possibility for take-over is a continuing issue during the time of the study. Three years before the study was conducted, a large restructuring operation had been implemented, involving a transition from individual-based to team-based practices along with downsizing and reduction of the number of management staff.

Employees

Employees in the firm are unionized. The union contract permitted a limited number of sick days for which the employee received full pay – unlimited additional sick days (up to two years) could be taken at 70 per cent salary, provided a doctor's certificate was provided. The restructuring programme had resulted in a number of employees working in new positions that were considered less interesting and providing lower status. This was particularly true for a small number of maintenance staff and offshore engineers who, because of their frequent absence were not included in the study.

Morale

Employees traditionally derived a strong sense of pride working for the company, which provided them with a strong identity and relatively good working conditions, pay and benefits packages. The economic changes of the nineties, making old industry less interesting to work for, undermined this sense of pride and the restructuring programme induced some unrest and uncertainties as well as role ambiguities and sense of increased work pressures.

Method

Sample

Respondents were employees of a company specialized in the development and construction of food processing systems. On the initiative of both management and labor unions a project with regard to work stress was started. The DUTCH was included in the instrument to assess the level of stress and several related concepts. All employees (including employees from the general management and financial and sales departments, as well as employees in production or technical positions) were asked to participate.

Out of 364 employees 308 returned the questionnaire (response rate = 85 per cent). Seven questionnaires were not included in the analyses because of one or more missings. Mean age and length of appointment of the respondents were 43.91 ($SD = 10.41$) and 21.32 ($SD = 13.01$) years, respectively. Eleven per cent of the respondents were female.

Procedure

The DUTCH was part of a booklet which contained in all about 250 items. The other items dealt with sources of stress, health, work satisfaction, control, etc. The items of the DUTCH were in random order. A research assistant invited employees to participate in the study, and an accompanying cover letter from the firm's CEO emphasized the importance of participating as well as its voluntary and anonymous character. The cover letter further explained the purpose of the study, which was to get a better understanding of the way employees work together, experience their work environment (e.g., technical equipment, internal communications) to be able to improve the situation where necessary. The research assistant administered the questionnaires in small groups (it was sent to the home address of employees who were not able to attend these group sessions). The questionnaires were filled in anonymously and collected by the research assistant.

Analysis and Results

Unidimensionality and interrelations of the four sub-scales

The internal consistency reliability coefficients (coefficient α) were computed for the four scales. The minimal acceptable level of alpha was set to be 0.60. (For tests that are primarily meant to study groups a reliability coefficient of between 0.60 and 0.70 qualifies as 'sufficient' and a coefficient of 0.70 or higher as 'good' [Bartram, 1997; Evers, *et al.*, 2000]). Since a high alpha is no guarantee for unidimensionality (Crocker and Algina, 1986), LISREL analyses were conducted to check for unidimensionality. By means of this analysis we checked for unwanted high correlations between pairs of items that were too similar in content, that is items that cause an 'unfair' increase in alpha. We used the fit indices of χ^2 (divided by *df*), the adjusted goodness-of-fit index (AGFI) and root mean square of approximation (RMSEA), which are important for scale development (Bentler, 1990; Schumacker and Lomax, 1996). A low χ^2 (when judged against degrees of freedom) is suggestive of good fit. An AGFI above 0.90 is indicative of good fit and above 0.95 of excellent fit. The RMSEA residuals should be about 0.05 or smaller for a good fit.

Table 3 reports the basic psychometric properties of the DUTCH scales. The internal consistencies can be qualified as sufficient, and, except for two RMSEA figures which are somewhat too high, all fit indices show good fit. The AGFI values reveal excellent fit. Apparently the items fit well into their respective scales and the high fit indices and low RMSEA values show that no unwanted overlap between items within a scale is detected. From these data we conclude that each scale separately delivers reliable information with respect to unidimensionally measured constructs.

Table 3. Internal consistencies and LISREL fit indices of the DUTCH scales

| | α | χ^2 | <i>df</i> | AGFI | RMSEA |
|---------------|----------|----------|-----------|------|-------|
| Yielding | 0.65 | 1.95 | 2 | 0.99 | 0.00 |
| Dominating | 0.83 | 5.57 | 2 | 0.96 | 0.07 |
| Collaborating | 0.73 | 1.32 | 2 | 0.99 | 0.00 |
| Avoiding | 0.64 | 5.76 | 2 | 0.95 | 0.08 |

Table 4. Goodness-of-fit indices for one-, two-, three-, and four-factor models

| Model | χ^2 | df | AGFI | RMSEA |
|---------------------------------|----------|-----|------|-------|
| Null model | 1316.05* | 120 | 0.54 | 0.21 |
| One-factor model ^a | 836.78* | 104 | 0.59 | 0.18 |
| Two-factor model ^b | 552.14* | 103 | 0.72 | 0.13 |
| Three-factor model ^c | 356.42* | 101 | 0.81 | 0.10 |
| Four-factor model ^d | 233.08* | 98 | 0.87 | 0.07 |

Note. AGFI = adjusted goodness-of-fit index; RMSEA = root mean square error of approximation.

* $p < 0.001$.

^aDifference one-factor and null model: $\chi^2(16) = 479.27$.*

^bDifference two and one-factor model: $\chi^2(1) = 284.64$.*

^cDifference three and two-factor model: $\chi^2(2) = 195.72$.*

^dDifference four and three-factor model: $\chi^2(3) = 123.34$.*

The next step was to test the proposed four-factor model by means of a maximum likelihood LISREL analysis of the covariance matrix of the 16 DUTCH items. In this model each of the items was allowed to load on its associated factor only, and the four factors (representing the four scales) were not allowed to correlate. The same fit indices as mentioned above were used. Following Rahim and Magner (1995), we also computed the GFI for the independent or null-model and one- through four-factor models. The two-factor model grouped (a) problem solving and yielding; and (b) forcing and avoiding (*cf.* Deutsch, 1973). In the three-factor model only the items of the sub-scales avoiding and yielding were grouped together, whereas the remaining two factors comprised the same items as in the four-factor model (*cf.*, Putnam and Wilson, 1982). Table 4 summarizes the measures of the GFI for the null- and one- through four-factor models. All measures show a gradual increase, and the four-factor model is superior to all other models. The χ^2/df -ratio is good; however, the AGFI is a little bit too low and the RMSEA is a little bit too high. Nevertheless the values are indicative of a sufficient to good fit. In all, the results show that the four-factor model constitutes a good representation of the interrelations among the 16 items of the DUTCH.

Discriminant validity

The third step in the analyses was to assess the discriminant validity of the scales of the DUTCH by computing the correlations between the latent factors. The values on the diagonal were set to 1 (the completely standardized solution). Table 5 shows the factor intercorrelations for the total group. The results support the discriminant validity of the scales, in that the intercorrelations between scales are generally low (the correlation of 0.33 between yielding and avoiding being the highest correlation).

Table 5. Factor intercorrelation matrix ($n = 301$)

| DUTCH-factors | 1 | 2 | 3 | 4 |
|------------------|-------------|--------------|---------------|---|
| 1. Yielding | – | | | |
| 2. Dominating | 0.12 (0.07) | – | | |
| 3. Collaborating | 0.12 (0.11) | 0.00 (–0.02) | – | |
| 4. Avoiding | 0.33 (0.23) | 0.13 (0.14) | –0.23 (–0.08) | – |

Note: Indices in brackets are correlations between manifest variables.

STUDY 3

Study 1 and 2 revealed that the lean version of the DUTCH has acceptable to good psychometric properties. As mentioned at the outset, however, some scholars argue that in addition to the four strategies identified in Dual Concern Theory, compromising should be considered as a distinct strategy rather than as a 'lazy form of problem solving' (*cf.* Pruitt and Rubin, 1986; Van de Vliert, 1997). If true, we should be able to measure compromising, and confirmatory factor analyses should reveal better fit for a five-factor rather than a four-factor model. In addition, multidimensional scaling should reveal a pattern of inter-correlations that fits a two-dimensional space with forcing, problem solving, yielding and avoiding occupying corner positions in a 2×2 space and compromising occupying a centre position (*cf.*, Figure 1). To examine these issues, Study 3 examined the psychometric properties of a five-scale version of the DUTCH. The instrument is identical to the one used in Study 1 and 2 but also includes four items to measure compromising.

Method

Sample

Data were collected from a heterogeneous sample of professionals ($n = 2403$). Mean age and work experience of the respondents were 34.14 ($SD = 8.41$) and 5.52 ($SD = 5.73$) years, respectively. Thirty per cent of the respondents were female.

Data gathering procedure

The DUTCH was placed on the web-site of the Dutch weekly magazine *Intermediair* (published by Elsevier / Reed). The magazine is targeted towards higher educated professionals in the fields of management, consulting, personnel counselling, financial administration and controlling, and law. Its aims include providing information about career possibilities and updates on technological and human resource developments in various professional fields. The web-site has been installed to support the printed paper version of the magazine, and contains various kinds of information, including several tests designed to screen one's own tendencies and policies. The DUTCH was part of this series of tests. Respondents were asked to answer several background questions tapping into their demographic characteristics and their work situation. Subsequently, they were presented with the 20 items of the DUTCH (four items measuring forcing, problem solving, compromising, yielding, and avoiding; see Appendix A). Questions were presented in a random order. In between December 1998 and March 1999, 2403 respondents completed the questionnaire. We screened the answers (including biographical data) to eliminate respondents that filled out the questionnaire more than once. This reduced the sample size to 2182.

Measures

The background questions assessed gender and age. In addition, respondents were asked whether they experienced most conflicts in their work situation with (1) their superior(s), (2) their peers and

colleagues, (3) their subordinate(s), or (4) other. Subsequently, respondents were asked 'how they tend to deal with conflict in their daily work situations.' The 20 items of the DUTCH were presented in a random order. When respondents had answered all questions, they were provided with a short description of the five conflict management strategies (respondents could not enter this site when they had not answered all questions). This description also contained some references for further reading, in case respondents were interested in learning more about conflict and conflict management in organizations.

Analysis and Results

Unidimensionality and interrelations of the five sub-scales

Table 6 reports the basic psychometric properties of the DUTCH sub-scales. The internal consistencies can be qualified as sufficient, and except for one χ^2/df -ratio, all fit indices show good fit. The AGFI values reveal excellent fit. Apparently the items fit well into their respective scales and no unwanted overlap between items within a scale is detected. From these data we conclude that each scale separately delivers reliable information with respect to unidimensionally measured constructs.

The next step was to test the proposed five-factor model by means of a maximum likelihood LISREL analysis of the covariance matrix of the 20 DUTCH items. In this model each of the items was allowed to load on its associated factor only, and the five factors (representing the five scales) were not allowed to correlate. In addition to the models computed in Study 2 we computed a five-factor model which included compromising as a distinct strategy. Table 7 summarizes the measures of the GFI for

Table 6. Internal consistencies and LISREL fit indices of the DUTCH scales

| | α | χ^2 | <i>df</i> | AGFI | RMSEA |
|-----------------|----------|--------------------|-----------|------|-------|
| Yielding | 0.65 | 0.44 | 2 | 1.00 | 0.00 |
| Compromising | 0.66 | 8.49 | 2 | 0.99 | 0.04 |
| Forcing | 0.70 | 1.73 | 2 | 1.00 | 0.00 |
| Problem solving | 0.68 | 19.50 [†] | 2 | 0.98 | 0.06 |
| Avoiding | 0.73 | 9.25* | 2 | 0.99 | 0.04 |

* $p < 0.01$; [†] $p < 0.001$.

Table 7. Goodness-of-fit indices for one-, two-, three-, four-, and five-factor models

| Model | χ^2 | <i>df</i> | AGFI | RMSEA |
|---------------------------------|-----------|-----------|------|-------|
| Null model | 9513.84** | 190 | 0.55 | 0.19 |
| One-factor model ^a | 5798.63** | 170 | 0.64 | 0.16 |
| Two-factor model ^b | 4358.11** | 169 | 0.74 | 0.12 |
| Three-factor model ^c | 2752.42** | 167 | 0.83 | 0.10 |
| Four-factor model ^d | 1980.36** | 164 | 0.87 | 0.08 |
| Five-factor model ^e | 1214.77** | 160 | 0.93 | 0.05 |

Note. AGFI = Adjusted Goodness-of-Fit Index; RMSEA = Root Mean Square Error of Approximation.

* $p < 0.001$.

^aDifference one-factor and null model: $\chi^2(20) = 3815.21$.*

^bDifference two and one-factor model: $\chi^2(1) = 1440.52$.*

^cDifference three and two-factor model: $\chi^2(2) = 1605.69$.*

^dDifference four and three-factor model: $\chi^2(3) = 772.06$.*

^eDifference four and five-factor model: $\chi^2(4) = 765.59$.*

the null- and one- through five-factor models. All measures show a gradual increase, and the five-factor model is superior to all other models. The AGFI and RMSEA values indicate a good fit. Although the χ^2/df -ratio is too high, our very large sample size can be held responsible for this high value of χ^2 , since χ^2 is dependent on sample size. A reanalysis with a random sample of 1000 respondents resulted in a decrease of χ^2 to 556, whereas the other indices remained the same. This shows that the five-factor model constitutes a good representation of the interrelations among the 20 items of the DUTCH.

Discriminant validity

The third step in the analyses was to assess the discriminant validity of the scales of the DUTCH by computing the correlations between the latent factors. The values on the diagonal were set to 1 (the completely standardized solution). Tables 8 and 9 show the factor intercorrelations for the total and gender groups, and for the groups that differ in hierarchical level of the conflict opponent respectively. Over all sub-samples the correlations show a consistent pattern. Although there are some fluctuations, these rarely exceed 0.10. The results support the discriminant validity of the scales, as the intercorrelations between scales are generally low (the correlations between yielding and compromising, yielding and avoiding, and compromising and problem solving are moderate, but for each scale enough specific variance remains).

Invariance across gender and hierarchical level

The fourth step in the analyses was to examine the invariance of the five-factor model of the DUTCH across different groups. Two analyses were performed: one for gender, and one for the hierarchical level of the conflict opponent. For each analysis the covariance matrices for the 20 DUTCH items were computed. We verified whether age was related to conflict management, and results showed it was not.

Table 8. *Factor Intercorrelation matrix for total and gender groups*

| DUTCH-factors | 1 | 2 | 3 | 4 | 5 |
|-------------------------------|---------------|---------------|---------------|---------------|---|
| <i>Total group (n = 2182)</i> | | | | | |
| 1. Yielding | – | | | | |
| 2. Compromising | 0.41 (0.20) | – | | | |
| 3. Forcing | –0.28 (–0.15) | 0.02 (0.04) | – | | |
| 4. Problem solving | 0.19 (0.10) | 0.50 (0.33) | 0.06 (0.08) | – | |
| 5. Avoiding | 0.51 (0.39) | 0.22 (0.20) | –0.21 (–0.15) | –0.20 (–0.11) | – |
| <i>Men (n = 1543)</i> | | | | | |
| 1. Yielding | – | | | | |
| 2. Compromising | 0.37 (0.23) | – | | | |
| 3. Forcing | –0.26 (–0.16) | 0.08 (0.08) | – | | |
| 4. Problem solving | 0.19 (0.11) | 0.52 (0.35) | 0.12 (0.11) | – | |
| 5. Avoiding | 0.51 (0.39) | 0.20 (0.19) | –0.21 (–0.16) | –0.18 (–0.10) | – |
| <i>Women (n = 639)</i> | | | | | |
| 1. Yielding | – | | | | |
| 2. Compromising | 0.50 (0.30) | – | | | |
| 3. Forcing | –0.35 (–0.20) | –0.12 (–0.04) | – | | |
| 4. Problem solving | 0.20 (0.07) | 0.46 (0.30) | –0.06 (0.00) | – | |
| 5. Avoiding | 0.51 (0.39) | 0.27 (0.25) | –0.21 (–0.14) | –0.24 (–0.13) | – |

Note: Indices in brackets are correlations between manifest variables.

Table 9. Factor intercorrelation matrix for hierarchical relation groups

| DUTCH-factors | 1 | 2 | 3 | 4 | 5 |
|--|---------------|---------------|---------------|---------------|---|
| <i>Conflict with superior (n = 564)</i> | | | | | |
| 1. Yielding | – | | | | |
| 2. Compromising | 0.46 (0.31) | – | | | |
| 3. Forcing | –0.17 (–0.09) | 0.15 (0.14) | – | | |
| 4. Problem solving | 0.22 (0.12) | 0.43 (0.29) | 0.06 (0.08) | – | |
| 5. Avoiding | 0.50 (0.38) | 0.24 (0.21) | –0.18 (–0.13) | –0.17 (–0.10) | – |
| <i>Conflict with colleague (n = 736)</i> | | | | | |
| 1. Yielding | – | | | | |
| 2. Compromising | 0.40 (0.23) | – | | | |
| 3. Forcing | –0.41 (–0.22) | –0.07 (0.00) | – | | |
| 4. Problem solving | 0.03 (0.01) | 0.50 (0.34) | 0.07 (0.08) | – | |
| 5. Avoiding | 0.62 (0.43) | 0.22 (0.20) | –0.22 (–0.16) | –0.28 (–0.16) | – |
| <i>Conflict with subordinate (n = 310)</i> | | | | | |
| 1. Yielding | – | | | | |
| 2. Compromising | 0.51 (0.33) | – | | | |
| 3. Forcing | –0.40 (–0.27) | –0.16 (–0.08) | – | | |
| 4. Problem solving | 0.33 (0.18) | 0.54 (0.36) | –0.09 (–0.02) | – | |
| 5. Avoiding | 0.47 (0.38) | 0.28 (0.25) | –0.19 (–0.14) | –0.05 (–0.01) | – |

Note: Indices in brackets are correlations between manifest variables.

For the total sample, the correlation with age was $r = 0.06, -0.03, -0.08, 0.06,$ and 0.05 for avoiding, dominating, compromising, yielding and problem solving, respectively. Further analyses revealed no differences between male and female respondents.

We estimated six models using LISREL and compared them sequentially. In Model 1 the pattern of factor loadings is held invariant. In Model 2 the pattern of factor loadings, and the factor loadings are held invariant. In Model 3 the pattern of factor loadings, the factor loadings, and the item intercepts are held invariant. In Model 4 the pattern of factor loadings, the factor loadings, the item intercepts, and the errors are held invariant. In Model 5 the pattern of factor loadings, the factor loadings, the item intercepts, the errors, and the variances/covariances are held invariant. In Model 6, finally, the pattern of factor loadings, the factor loadings, the item intercepts, the errors, the variances/covariances, and the mean are held invariant. Besides χ^2/df , and the RMSEA for these analyses the GFI- and Akaike's information criterion (AIC) indices are reported. The interpretation of the GFI index is similar to AGFI. AIC is a badness-of-fit indicator, with small values indicating good fits and large values poor ones. It is added because the difference in AIC when imposing more restrictions gives additional information about the parsimony of the model. Decreasing χ^2 by solving for more parameters will only be a benefit if χ^2 is decreased by more than 2.0 for each parameter added. If this is the case AIC will decrease as well (Loehlin, 1998). Tables 10 and 11 present the results with respect to the analysis of the factor invariance. Table 10 shows the results for gender, and Table 11 for the hierarchical level of the conflict opponent. (Participants were allowed to indicate whether they primarily had conflicts with their superior(s), their colleague(s), their subordinate(s), or 'other.' Those classifying themselves in the latter category are left out of these analyses.) Note that the first three models in this analysis are the most critical. The difference in χ^2 between Model 2 and Model 1 was significant for gender, indicating that the hypothesis of equal factor loadings for men and women must be rejected. However, the magnitude of the differences in Table 10 suggests this is not a severe problem. The tests for the differences of all other consecutive models were negative, implying equal item intercepts, errors, variances/covariances, and means for men and women. As AIC gradually decreases (except for the step from Model 1 to Model 2), one can conclude that the more restrictions are

Table 10. Invariance analysis across gender

| Model | AIC | GFI | χ^2 | df | RMSEA |
|---|---------|------|----------|-----|-------|
| 1. Equal factor pattern | 1751.39 | 0.92 | 1394.94* | 320 | 0.06 |
| 2. Model 1 + equal factor loadings [†] | 1752.72 | 0.92 | 1427.50* | 335 | 0.06 |
| 3. Model 2 + equal item intercepts [‡] | 1731.14 | 0.92 | 1436.96* | 350 | 0.06 |
| 4. Model 3 + equal errors [¶] | 1722.97 | 0.92 | 1464.18* | 370 | 0.05 |
| 5. Model 4 + equal variances/covariances [§] | 1710.95 | 0.92 | 1483.49* | 385 | 0.05 |
| 6. Model 5 + equal means ^{¶¶} | 1706.79 | 0.92 | 1490.16* | 390 | 0.05 |

Note. Male = 1543; female = 639. AIC = Akaike's information criterion; GFI = goodness-of-fit; RMSEA = root mean square error of approximation.

* $p < 0.001$.

[†]Model 2 - Model 1: $\chi^2(15) = 32.56$ ($p < 0.01$).

[‡]Model 3 - model 2: $\chi^2(15) = 9.46$ ($p < 0.85$).

[¶]Model 4 - model 3: $\chi^2(20) = 27.22$ ($p < 0.13$).

[§]Model 5 - model 4: $\chi^2(15) = 19.31$ ($p < 0.20$).

^{¶¶}Model 6 - model 5: $\chi^2(5) = 6.67$ ($p < 0.25$).

Table 11. Invariance analysis across hierarchical relationship to conflict opponent

| Model | AIC | GFI | χ^2 | df | RMSEA |
|---|---------|------|----------|-----|-------|
| 1. Equal factor pattern | 1757.22 | 0.91 | 1315.16* | 480 | 0.06 |
| 2. Model 1 + equal factor loadings [†] | 1721.85 | 0.90 | 1346.40* | 510 | 0.06 |
| 3. Model 2 + equal item intercepts [‡] | 1686.84 | 0.90 | 1371.69* | 540 | 0.05 |
| 4. Model 3 + equal errors [¶] | 1644.84 | 0.90 | 1414.52* | 580 | 0.05 |
| 5. Model 4 + equal variances/covariances [§] | 1647.97 | 0.89 | 1467.59* | 610 | 0.05 |
| 6. Model 5 + equal means ^{¶¶} | 1638.65 | 0.89 | 1476.44* | 620 | 0.05 |

Note. Conflict with superior = 564; conflict with colleague = 736; conflict with subordinate = 310. AIC = Akaike's information criterion; GFI = goodness-of-fit; RMSEA = root mean square error of approximation.

* $p < 0.001$.

[†]Model 2 - Model 1: $\chi^2(30) = 31.26$ ($p < 0.40$).

[‡]Model 3 - Model 2: $\chi^2(30) = 25.29$ ($p < 0.71$).

[¶]Model 4 - Model 3: $\chi^2(40) = 42.83$ ($p < 0.35$).

[§]Model 5 - Model 4: $\chi^2(30) = 53.07$ ($p < 0.01$).

^{¶¶}Model 6 - Model 5: $\chi^2(10) = 8.85$ ($p < 0.55$).

imposed upon the data the better they fit. This provides strong evidence of factor invariance for the inventory across gender.

The analyses for the various groups that are formed with respect to the hierarchical level of the conflict opponent show the hypotheses of equal factor loadings, equal item intercepts, equal errors, and equal means cannot be rejected for these groups (see Table 11). However, the difference in χ^2 between Model 4 and Model 5 was significant, indicating that the hypothesis of equal variances and covariances must be rejected. For all the other restrictions the model is invariant for hierarchical level, and with all the restrictions imposed the model seems to fit best (as shown by the decrease in AIC). Thus, we can conclude that the analyses support the factor invariance of the inventory for hierarchical level of the conflict opponent as well.

Multidimensional scaling

Although the results show that the DUTCH tends to have good psychometric quality, the question remains whether the ordering of the five sub-scales corresponds to what one would predict on the

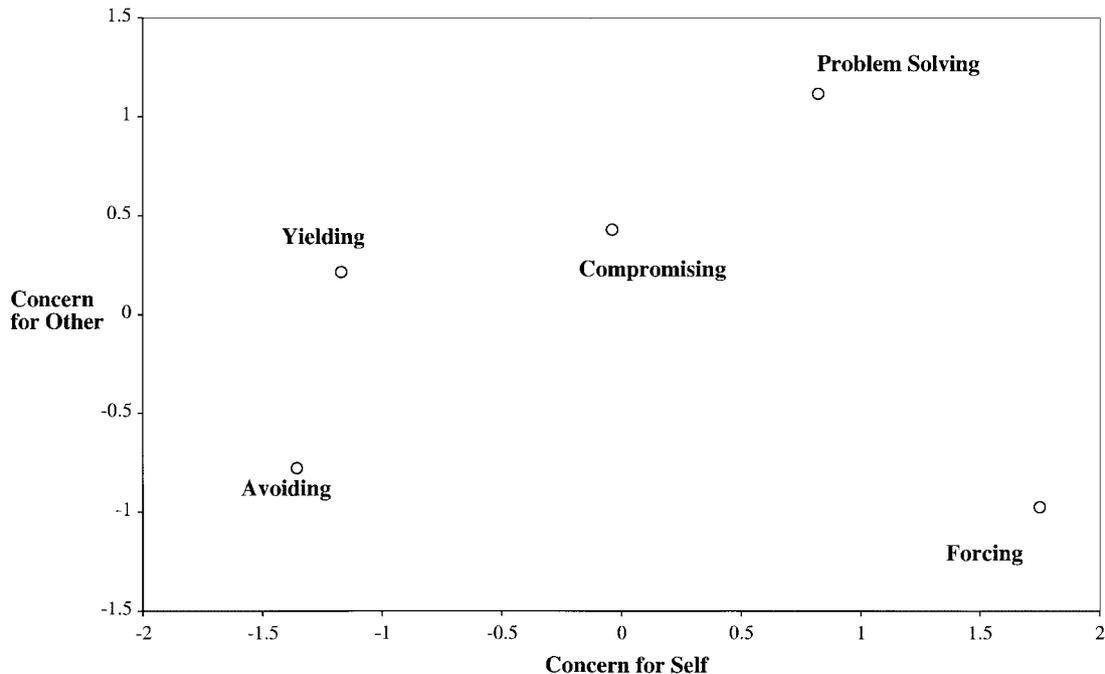


Figure 2. Empirical representation of the five conflict management strategies as a function of two dimensions (concern for self and concern for other)

basis of the Dual Concern Theory (see Figure 1). To answer this question, we conducted a multi-dimensional scaling of the data. The purpose of this procedure is to find a configuration of points whose Euclidean output distances reflect as closely as possible the rank order of input dissimilarities. Assuming the data fit one dimension (e.g., competition–cooperation) yielded an unsatisfactory fit (Young's $S = 0.19$, with $R^2 = 0.87$). Assuming two dimensions (i.e., concern for one's own outcomes, and concern for other) results revealed that Young's stress index was 0.00251 (0.00147 for the matrix), with $R^2 = 0.99$, which is both very good. The solution is displayed in Figure 2. As can be seen, compromising tends to be in the middle, while forcing, avoiding, problem solving and yielding tend towards the corners of the 2×2 matrix. It should be mentioned, however, that yielding is too close to avoiding. Nevertheless, the pattern of (Euclidean) distances tends to corroborate the theoretical pattern depicted in Figure 1.

Conclusions and General Discussion

To study conflict management strategies in the workplace, reliable and valid instruments are crucial. Unfortunately, instruments that survey in the literature and are used by scientists and practitioners to assess (preferences for) conflict management strategies may be criticized on methodological or practical grounds. The current research builds upon earlier work by Van de Vliert (1997) and was concerned with the psychometric qualities in the Dutch Test for Conflict Handling (DUTCH). We sought answers to two questions. First, do self-reports of conflict management strategies converge with

other (i.e., opponent) reports and do self-reports converge with actual conflict behavior? Second, what are the psychometric qualities of the DUTCH? We examined two versions of the DUTCH. In Studies 1 and 2 we used a 16-item instrument that measures problem solving, forcing, yielding, and avoiding. In Study 3 we examined a 20-item instrument that measured compromising in addition to the other four conflict management strategies.

Theoretical implications

Study 1 showed convergence between self-reports of problem solving, forcing, and yielding on the one hand, and opponent-reports of these strategies on the other. Moreover, Study 1 revealed the expected correlations between self-reports of forcing and problem solving and observer ratings of conflict behavior during negotiation. Less supportive results were obtained for avoiding. Although the psychometric qualities of the sub-scale for avoiding were good, self-reports of avoiding did not converge with reports by the conflict opponent, or with observer ratings. A possible explanation is that avoiding is the more ambiguous strategy open to multiple attributions. For example, a conflict party who consistently downplays the importance of the conflict issue may do this in order to avoid the issue and to reduce interaction to a minimum. The opponent, however, may perceive such behavior as a cunning way to get one's way, to buy time and to impose one's will on others (i.e., forcing). Perhaps avoiding, more than any of the other conflict management strategies, involves behaviors that are difficult to judge, making accurate understanding of underlying intentions more important. Because the individual has better knowledge about one's own intentions than opponents and neutral observers convergence between self-reports and other, reports of avoiding is likely to be low.

An issue that has generated some debate in the conflict literature is whether compromising is a 'lazy form of problem solving' (Pruitt and Rubin, 1986) or a truly distinct conflict management strategy (Van de Vliert, 1997). Up to now, the debate has been conceptual rather than empirical. However, if compromising is indeed a distinct strategy one should be able to design items that are distinct from items designed to measure problem solving and confirmatory factor analysis should reveal a better fit for a five-factor than a four-factor model. Study 3 showed both conditions can be satisfied. In addition, if compromising is a truly distinct strategy that results from intermediate concern for self and intermediate concern for others, multidimensional scaling should reveal a pattern of inter-correlations that closely fits the Dual Concern Theory depicted in Figure 1. Again, Study 3 (i.e., Figure 2) showed this condition can be satisfied: avoiding, forcing, problem solving and yielding occupied positions in the four corners of a two-dimensional space, while compromising tended towards a midpoint position. This pattern of results speaks to the construct validity of the instrument and the sub-scale measuring compromising in particular. More importantly, these results contribute to conflict theory in that they lend further (empirical) support for the argument that compromising is distinct from problem solving (*cf.*, Van de Vliert and Kabanoff, 1990; Van de Vliert, 1997). It is concluded that future research, theory development, and practice would benefit from closer attention to compromising as a distinct strategy for managing conflict at work.

The psychometric evidence for the DUTCH provides indirect support for Dual Concern Theory and, as such, complements experimental and field research (for reviews, see De Dreu *et al.*, 2000; Van de Vliert, 1997). Although Dual Concern Theory has been around for quite some time, many scholars continue to work with related but different models. For instance, the basic distinction between competition and cooperation continues to inspire much theoretical and empirical work (for a review, see Tjosvold, 1998). The current research indicates this basic distinction to be too broad and we suggest that future research and practice would benefit from the more fine-grained analysis offered by Dual Concern Theory.

The results of the three studies together suggest that for problem solving, forcing and yielding (but not for avoiding) self-reports converge with opponent-reports and with actual conflict behavior. Results of Studies 2 and 3 show that the lean and expanded version of the instrument has good psychometric qualities. Convergent and discriminant validity were good, and invariance across gender and hierarchical relationship was high. These studies show that the DUTCH is a psychometrically sound instrument that has, except for avoiding, good predictive validity. The DUTCH appears to be a flexible and parsimonious instrument that may be of use to both researchers interested in the relationships between conflict management strategies and related aspects of organizational life, as well as to practitioners interested in diagnosing (preferences for) conflict management strategies in organizational settings. Although direct, empirical comparisons await future research, the psychometric qualities of the DUTCH appear to compare favorably to other instruments in the literature and future research may benefit from using the DUTCH.

Self-serving biases

Study 1 revealed that self-ratings for problem solving were significantly higher than ratings by one's conflict opponent. This may reflect a self-serving bias in the assessment of one's conflict management. Self-serving bias has been observed in a wide variety of settings including conflicts in organizational settings, in close relationships and in interpersonal negotiation (for a review, see Johns, 1998). Current results are consistent with this past research. Our results suggest social desirability did not play an important role because social desirability would lead one to over-estimate one's tendency towards problem solving and to underestimate one's tendency to engage in forcing. The latter was not observed. It may well be that people tend to underestimate the extent to which their opponent engages in problem solving. Conflict research suggests people tend to overly emphasize other's negative traits and behaviors (De Dreu *et al.*, 1995) and tend to engage in 'hostile attributions' – suspecting ulterior motives underlying other's ambiguous behavior (Baron, 1997).

An interesting avenue for future research is to examine the conditions that foster or inhibit the individual's tendency to underestimate the opponent's tendency to engage in problem solving. The study by De Dreu *et al.* (1995) suggested that as conflict intensifies self-serving bias becomes more pronounced, presumably because conflict parties feel more threatened and develop a more negative view of their opponent (*cf.*, Rubin *et al.*, 1994). A recent study by Gelfand *et al.* (2000 – manuscript under review) showed that negotiators in an individualistic culture, such as the U.S. or the Netherlands, were more likely to develop self-serving perceptions of own and other's conflict management than negotiators in a collectivist culture, such as Japan. They explained this cultural difference in terms of the collectivist negotiator's stronger inclination to define oneself in terms of interdependent rather than independent social structures. Together, these studies suggest that self-serving perceptions of conflict management develop especially when conflict parties define themselves as different rather than similar from their conflict opponent.

Limitations and avenues for future research

The current research has strengths as well as weaknesses. We examined the psychometric qualities of the DUTCH in a variety of samples (psychology students in Study 1; employees in a manufacturing firm in Study 2; and a large sample of higher educated professionals in Study 3). In addition, we used multiple ways to gather data, including paper-pencil and computerized methodology. Consistency across studies suggests the specific way in which data are gathered does not substantially impact

the validity of the (sub) scales, but more controlled studies are needed to settle this issue. Also, results in Study 3 may have been influenced by self-selection, in that we had no control over who did, and who did not visit the web site, and who did decide (not) to participate in the study. Finally, we included two versions of the DUTCH, a lean version that included problem solving, forcing, yielding and avoiding, and an expanded version that also included compromising. Although both versions appeared to have sound psychometric qualities, the drawback of this approach is that we have no data regarding the convergence between self-reports and other-reports for compromising. This issue needs to be addressed in future research.

To understand the results for avoiding we distinguished between intentions and (observable) behaviors. Likewise, in discussing the self-serving perceptions of conflict management strategies, we distinguished between intentions and behavior. In the conflict literature, this distinction is not always explicit. Although we asked people what they do when in conflict, it may be safe to assume that the DUTCH is a measure of the individual's behavioral intentions, rather than his or her actual behavior. Sometimes, intentions translate into actual behavior, but sometimes they do not. Sometimes, intentions do translate into behavior but it is not perceived as such. Conflict theory, and future research on scale development, may benefit from a more thorough analysis of what individuals in conflict want to do, what they believe they should do, and what they actually do.

As mentioned at the outset, the DUTCH is not necessarily limited to the Dutch culture. The theoretical basis for the instrument generalizes across cultural boundaries, and we expect the psychometric properties to be constant across culture. This is not to say, however, that individuals from different cultures respond to conflict in similar ways. Cultural differences should reveal itself, however, in differences in the means and not in differences in factor structures and related psychometric properties. Future research is needed, however, to test the psychometric properties of the DUTCH in different cultures.

Preferences for conflict management: person or situation?

Before closing, we wish to address the question of whether conflict management is stable over time, or primarily the product of the situation. In Dual Concern Theory conflict management is seen as the product of concern for self and concern for others (see Figure 1). Concern for self and concern for others are, in turn, predicted by one's personality and the situation (De Dreu *et al.*, 2000; Pruitt and Rubin, 1986; Van de Vliert, 1997). For instance, stable individual differences in social value orientation correlate with concern for others: Parties with a pro-social orientation have higher concern for others than parties with an individualistic or competitive value orientation. Likewise, evidence suggests stable individual differences in collectivist versus individualistic values predict concern for others and that conflict parties that score high on agreeableness also tend to have higher concern for others. At the same time, instructions by constituents, incentive structures, the expectation of cooperative future interaction, and positive mood inductions all increase concern for others (De Dreu *et al.*, 2000).

The fact that conflict management is the product of both personality and the situation does not suggest necessarily that within a particular work setting conflict management cannot be accurately predicted on the basis of instruments like the DUTCH. Work settings tend to remain relatively stable over time. Employees interact with the same co-workers, incentive structures do not change overnight and employees do the same kind of work for longer periods of time and thus face the same (interpersonal) problems on a recurring basis. In addition, individuals within the same unit, team or department tend to influence one another (Salancik and Pfeffer, 1977), thus creating their own social environment with, most likely, rather stable preferences for dealing with conflict. The consequence is that an individual's actual and preferred conflict management strategies are likely to be relatively stable over time. We cannot know, however, whether this is due to stable individual differences, to the fact that the situation

is relatively impervious to change, or both. Consistent with Dual Concern Theory, however, we expect that the individual's conflict management strategies at work are relatively stable over time due to both stable individual differences and the relatively stable situations in which people work.

Conclusion

The current research reveals, first of all, that the DUTCH is a valid and reliable instrument that can be used to measure conflict management strategies in the workplace. The DUTCH may well complement the existing conflict management tests especially when flexibility and parsimony are important and psychometric quality is valued. Second, the current research indicates that conflict theory would improve by incorporating compromising as a separate conflict management strategy that is distinct from problem solving. Third, this study indicates that future research would benefit from using the DUTCH to assess an individual's conflict management strategies. Finally, this research suggests that practitioners should no longer rely on a broad competition–cooperation distinction, but consequently and consistently resort to a five-factor taxonomy of conflict management strategies when intervening in conflict situations, or assessing conflict management strategies in a particular organization.

Author biographies

Carsten K. W. De Dreu is Professor of Organizational Psychology at the University of Amsterdam and Director of Research of the Kurt Lewin Graduate School for Social Psychology. His research is concerned with social influence, group decision making, negotiation and organizational conflict.

Arne Evers is Associate Professor of Organizational Psychology at the University of Amsterdam. His research is concerned with test development and validation, occupational stress and vocational choice.

Bianca Beersma is a PhD student in Organizational Psychology at the University of Amsterdam. Her research concerns the motivational, cognitive and structural aspects of group negotiation, and team performance.

Esther Kluyer is Assistant Professor in Social and Organizational Psychology at Utrecht University. Her research interests are social conflict and social justice in close relationships and gender issues.

Aukje Nauta is Assistant Professor in the Department of Management and Organization at the University of Groningen, and Researcher at TNO Work and Employment. Her research interests include conflict and negotiation in organizations, organizational commitment, and human resource practices.

References

- Anderson JC, Gerbing DW. 1988. Structural equation modelling in practice: a review and recommended approach. *Psychological Bulletin* **103**: 411–423.
- Baron RA. 1997. Positive effects of conflict: insights from social cognition. In De Dreu CKW, Van de Vliert E (eds). *Using Conflict in Organizations*, Sage: London; 177–191.
- Bartram D. 1997. *Review of ability and aptitude tests (Level A) for use in occupational settings*. British Psychological Society Books: Leicester.

- Beersma B, De Dreu CKW. 1999. Negotiation processes and outcomes in prosocially and egoistically motivated groups. *International Journal of Conflict Management* **10**: 385–402.
- Bentler PM. 1990. Comparative fit indexes in structural models. *Psychological Bulletin* **107**: 238–246.
- Blake R, Mouton JS. 1964. *The Managerial Grid*. Gulf: Houston, TX.
- Carnevale PJD, Pruitt DG. 1992. Negotiation and mediation. *Annual Review of Psychology* **43**: 531–582.
- Crocker L, Algina J. 1986. *Introduction to Classical and Modern Test Theory*. Holt, Rinehart & Winston: Orlando, FL.
- De Dreu CKW, Nauta A, Van de Vliert E. 1995. Self-serving evaluation of conflict behavior and escalation of the dispute. *Journal of Applied Social Psychology* **25**: 2049–2066.
- De Dreu CKW, Harinck F, Van Vianen AEM. 1999. Conflict and performance in groups and organizations. *International Review of Industrial and Organizational Psychology* **14**: 376–405.
- De Dreu CKW, Giebels E, Van de Vliert E. 1998. Social motives and trust in integrative negotiation: the disruptive effects of punitive capability. *Journal of Applied Psychology* **83**: 408–422.
- De Dreu CKW, Weingart LR, Kwon S. 2000. Influence of social motives on integrative negotiation: a meta-analytical review and test of two theories. *Journal of Personality and Social Psychology* **78**: 889–905.
- Deutsch M. 1973. *The resolution of conflict: constructive and destructive processes*. Yale University Press: New Haven, CT.
- Euwema MC, Van de Vliert E. 1990. Gedrag en escalatie bij hiërarchische conflicten (Behavior and escalation in hierarchical conflicts). *Toegepaste Sociale Psychologie* **4**: 28–41.
- Evers A, Frese M, Cooper CL. 2000. Revisions and further developments of the Occupational Stress Indicator (OCI): LISREL results from four DUTCH studies. *Journal of Occupational and Organizational Psychology* **73**: 221–240.
- Janssen O, Van de Vliert E. 1996. Concern for other's goals: key to de-escalation of conflict. *International Journal of Conflict Management* **7**: 99–120.
- Johns G. 1998. A multi-level theory of self-serving behavior in and by organizations. *Research in Organizational Behavior* **21**: 1–38.
- Killman RH, Thomas KW. 1977. Developing a forced choice measure of conflict handling behavior. *Educational and Psychological Measurement* **37**: 309–325.
- Landy F. 1978. Conflict management survey. In Buros OK (ed). *Eighth mental Measurement Yearbook*, Vol. 2, Gryphon: Highland Park, NJ; 1173–1174.
- Loehlin JC. 1998. *Latent Variable Models. An Introduction to Factor, Path, and Structural Analysis, 3rd ed.* Lawrence Erlbaum: Mahwah, NJ.
- Pruitt DG. 1998. Social conflict. In Gilbert D, Fiske ST, Lindzey G. (eds). *Handbook of Social Psychology*, 4th edn, Vol. 2, McGraw-Hill: New York; 89–150.
- Pruitt DG, Rubin J. 1986. *Social Conflict: Escalation, Stalemate and Settlement*. Random House: New York.
- Putnam LL, Wilson CE. 1982. Communicative strategies in organizational conflicts: reliability and validity of a measurement scale. In *Communication Yearbook*, Vol. 6, Burgoon M. (ed). Sage: Beverly Hills, CA; 629–652.
- Rahim A, Magner NR. 1995. Confirmatory factor analysis of the styles of handling interpersonal conflict: first-order factor model and its invariance across groups. *Journal of Applied Psychology* **80**: 122–132.
- Rubin JZ, Pruitt DG, Kim S. 1994. *Social Conflict: Escalation, Stalemate, and Settlement*. McGraw-Hill: New York.
- Salancik GR, Pfeffer J. 1977. An examination of need satisfaction models of job satisfaction. *Administrative Science Quarterly* **22**: 427–456.
- Schumacker RE, Lomax RG. 1996. *A Beginners Guide to Structural Equation Modelling*. Lawrence Erlbaum: Mahwah, NJ.
- Shockley-Zalabak P. 1988. Assessing the Hall Conflict Management Survey. *Management Communication Quarterly* **1**: 302–320.
- Spector PE, Jex SM. 1998. Development of four self-report measures of job stressors and strain: interpersonal conflict at work scale, organizational constraints scale, quantitative workload inventory, and physical symptoms inventory. *Journal of Occupational Health Psychology* **3**: 356–367.
- Thomas KW. 1992. Conflict and negotiation processes in organizations. In Dunnette MD, Hough LM (eds). *Handbook of Industrial and Organizational Psychology*, 2nd ed, Vol. 3, Consulting Psychologists Press: Palo Alto, CA; 651–717.
- Thomas KW, Killman RH. 1978. Comparison of four instruments measuring conflict behavior. *Psychological Reports* **42**: 1139–1145.

- Tjosvold D. 1998. Cooperative and competitive goal approach to conflict: accomplishments and challenges. *Applied Psychology: An International Review* **47**: 285–342.
- Van de Vliert E. 1997. *Complex Interpersonal Conflict Behavior*. Psychology Press: London.
- Van de Vliert E, Kabanoff B. 1990. Toward theory-based measures of conflict management. *Academy of Management Journal* **33**: 199–209.

Appendix A

The Dutch Test for Conflict Handling (DUTCH)

When I have a conflict at work, I do the following:

Yielding

1. I give in to the wishes of the other party.
2. I concur with the other party.
3. I try to accommodate the other party.
4. I adapt to the other parties' goals and interests.

Compromising

5. I try to realize a middle-of-the-road solution.
6. I emphasize that we have to find a compromise solution.
7. I insist we both give in a little.
8. I strive whenever possible towards a fifty-fifty compromise.

Forcing

9. I push my own point of view.
10. I search for gains.
11. I fight for a good outcome for myself.
12. I do everything to win.

Problem solving

13. I examine issues until I find a solution that really satisfies me and the other party.
14. I stand for my own and other's goals and interests.
15. I examine ideas from both sides to find a mutually optimal solution.
16. I work out a solution that serves my own as well as other's interests as good as possible.

Avoiding

17. I avoid a confrontation about our differences.
18. I avoid differences of opinion as much as possible.
19. I try to make differences loom less severe.
20. I try to avoid a confrontation with the other.

Note. Items could be answered on a 5-point scale (1 = not at all, to 5 = very much). Items are translated from DUTCH and were presented in a random order.

The lean version (Study 1 and 2) does not include the *compromising* scale; the expanded version (Study 3) does include the *compromising* scale.