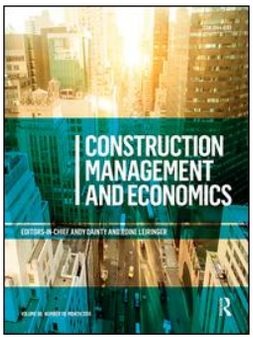

Routledge
Taylor & Francis Group

Construction Management & Economics

ISSN: 0144-6193 (Print) 1466-433X (Online) Journal homepage: https://www.tandfonline.com/loi/rcme20

# Analysis of value and project goal specificity in value management

Mei-Yung Leung & Anita M. M. Liu

**To cite this article:** Mei-Yung Leung & Anita M. M. Liu (2003) Analysis of value and project goal specificity in value management, Construction Management & Economics, 21:1, 11-19, DOI: 10.1080/0144619032000065081

**To link to this article:** https://doi.org/10.1080/0144619032000065081

*Construction Management and Economics* (2003) **21**, 11–19

Spon Press
Taylor & Francis Group

# Analysis of value and project goal specificity in value management

MEI-YUNG LEUNG[1]* and ANITA M. M. LIU[2]

[1]*Department of Building and Construction, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong, Hong Kong*
[2]*Department of Real Estate and Construction, University of Hong Kong, Pokfulam, Hong Kong*

Received 4 July 2001; accepted 8 August 2002

Value is a subjective term and is manifested in different ways such as attitude, belief, desire, preference, need and criteria. In this paper, a cognitive value management model for construction procurement is developed to examine how value is influenced by previous project outcomes and other environmental dynamics that affect project goal setting and conflict resolution in the value management process. The relationships among the variables of value specificity, goal specificity, conflict resolution and participant satisfaction are investigated in a behavioural model of value management. It is postulated that value-goal specificity and conflict resolution (integration) level in the value management process have a direct impact on satisfaction of project participants. The findings in a questionnaire survey indicate that more specific value and goal and higher conflict resolution (integration) level in the goal setting process can improve the participants' satisfaction.

*Keywords*: Value management, project goal specificity, conflict resolution, satisfaction

## Introduction

In construction projects, a common complaint is that the client's brief is inadequate as a document for communicating the goals to the project participants. A primary purpose of value management, therefore, is to specify the client's and participants' values and goals explicitly through a decision-making process. However, values and goals may be implicit and largely unspecified, quantitatively or qualitatively, or they may be quite explicit and detailed through the use of targets and quotas. Moreover, conflict (e.g. alternative proposals and other constraints) often arises during the decision process. Hence, the determination of value and goal specificity for the project and the management of conflict among the participants are fundamental in value management in order to determine the 'best' value by consensus/compromise.

While value may be analysed in term of cultural value as in anthropology, social value as in sociology or motivation as in psychology, value is defined as 'a conception (cognitive) of the desirable (affective) that influences the selection (conative) from available modes, means and ends of action' (Kluckhohn, 1959, p. 395) in this paper. A value management model is developed on the basis of a dynamic decision process and an organizational behaviour system that stems from premises of decision rationality, psychological value and goal setting theory (Lewin *et al.*, 1944; Kluckhohn, 1959; Locke and Latham, 1990).

## Towards a behavioural model

Traditional value management is mostly based on economic aspects emphasizing techniques, such as brainstorming, functional analysis (Dell'Isola, 1982; Kelly and Male, 1992) and weighted evaluation (Green, 1994), to solve 'hard' technical problems. However, such approach often fails to consider the management process holistically since both the technical tasks and the human resources variables are equally important. A total

*Author for correspondence. E-mail: bcmei@cityu.edu.hk

*Construction Management and Economics*
ISSN 0144–6193 print/ISSN 1466-433X online © 2003 Taylor & Francis Ltd
http://www.tandf.co.uk/journals
DOI: 10.1080/0144619032000065081

project orientation in a holistic perspective is more desirable than the fragmented approach in treating value engineering as a procedural subsystem.

The nature of the project process can be depicted as a flow of information that (1) stimulates and controls the flow of materials (Winch *et al.*, 1998) and (2) provides feedback for guiding the project participants' behaviour in attaining project goals (Liu and Walker, 1998). Liu and Walker (1998) argue that goal definition (in terms of its specificity translated from individuals' values) leads to types of project participants' behaviours that aggregate to performance; the discrepancy between the goal level (the level which is set) and the performance level (the level which is achieved) provides a basis for evaluating outcome (such as satisfaction). Hence, project goal setting is fundamental to the initiation of the project process.

Personal goals may often, but not necessarily, conflict with group goals. In the construction industry, personal goals refer to those of the various participants such as the client, architect and structural engineer. While the client's objectives should, arguably, represent that of the project team's, consensus project goals are resultants of decision making through resolution of certain latent and manifest conflict among project participants, say, at a value engineering (VE) workshop. Dynamism/changes of project goals occurs as a result of value-shift, i.e. changes, modifications by designers and amendments to legislation.

Project development comprises decision making that occurs in various stages, such as conception, feasibility and realization (Walker, 1996). At a decision stage such as that in a VE workshop, value is an assigned objective of the particular project representing the client's requirements or any criteria decided/chosen by the client in previous project development phases and a consensus project goal can be considered as a participative decision outcome as a resultant of the VE workshop. Thus, value for money represents the 'best value' indicative of the client's requirements being translated into project goals. Specific values have to be identified in order to create specific goals. The project participants then aspire to perform well in the project tasks to improve the final outcome (e.g. satisfaction).

The aim of this paper is to develop a value management model from the behavioural paradigm of goal-action-outcome to encompass:

- the translation of value specificity to goal specificity;
- the relationship of value conflict and goal setting; and
- the relationship of conflict resolution and project outcome.

## Concept of value

Value has been defined in different theoretical contexts, such as need, desire, interest, standard/criteria, beliefs, attitudes and preference (Katzell, 1964; Rescher, 1969; Rokeah, 1973). In value management, objective setting considers the participants' psychological needs and desires; subsequent analysis considers the deviation between desired value and that offered by the existing macro and microenvironments. Once the deviation (i.e. value's gap) has been identified, criteria ratings are applied by the participants to seek the (specific) desirable value. Further search in the decision process is carried out for the creation /suggestion of a number of alternatives for the decision-maker to make evaluation and judgement /choice.

There are two dimensions of *value*, an affective dimension and a cognitive dimension. The affective dimension of value involves three major components: person, object and environment. Since people are capable of representations and transformations of needs (Rokeach, 1973), values must be judged by individuals therefore subjectiveness is inevitable and related with human wants, needs, interest, etc. The interdependence of persons, objects and environment impacts upon such value judgement. Values must involve both the person who is engaged in valuing and the object that is being valued (Feather, 1975).

In construction development, the object is a building product that exists in an environment and influences the environment. Each project participant's judgement of the value-object is affected by two variables: person (self) and environment. The environmental variable consists of external factors – including culture, society, politics, regulation and economics – that influence the individual to internalize shared conceptions of the desirable. The personal (self) variable is viewed as consisting those internal factors inherent in an individual, such as past experience, future wishes and fears, and the present actual situation (which includes the individual's ability and knowledge, the intensity of the need, the hierarchy of the values and the difficulty of the tasks (refer Lewin *et al.*, 1944)).

Values affect project goal setting through an individual's emotions which stem from the valence of past success/failure (Lewin *et al.*, 1944) or level of satisfaction/dissatisfaction (Locke, 1969; Locke and Latham, 1990). The cognitive dimension of value (in a rational system) is manifested in an individual's choice of actions, i.e. the process of choosing among alternatives/options. It involves rational analysis of value itself and the determination of the discrepancy between subjective value and the existing (project) environment. In the rational system, value can be analysed by eight elements, including modality, content, generality, intent, intensity, explicitness, extent and organization (Kluckhohn, 1959). Of particular importance in the development of a value management model in this paper are the elements of generality

(governing thematic and specific values) and intent (governing instrumental and terminal values). Thematic values emphasize the general conception of desirable/undesirable modes/means/ends of action; specific values emphasize certain situations and content areas. In order to distinguish specific values (focal values) from general conception (value premises), value has to be distinguished as instrumental and terminal values under the means-ends principle. Instrumental value relates to an act or an object that 'actors and groups conceive as means to further ends', and terminal value is the 'aim and virtue that societies and individuals make for themselves' (Kluckhohn, 1959, p. 413). Feather (1975) points out that terminal values influence the valence of specific outcomes or end-states and that instrumental values influence the valence of specific instrumental behaviours or means to ends. Consider project participants in a VE workshop. Values influence both the valence of project goals or ends and the valence of means or types of activity that can lead to ends. An individual must consider both terminal and instrumental values in order to move a desired (or utopian) value from the domain of value premises (general conceptual values) to that of the focal values (specific values). This is manifested in the VE workshop when ideals (utopian values) are brought to a focal consensus of commonly acceptable specific value and are translated to attainable project.

## A conflict model of value management

Value management is a method to help the client better achieves their goals (Connaughton *et al.*, 1996; Male *et al.*, 1998). In order to identify a specific project goal, both specificity and conflict resolution play important roles in the whole process. A traditional value management job plan involves six phases for transforming assigned specific values (from the client) to (participatively set) specific goals (see Table 1). For example, specific value is presented by the client in the first phase (i.e. information phase), then debated upon and concluded by the participants in the final phase (i.e. presentation phase). The intermediary stages of functional analysis, idea creation, choice evaluation and proposal determination stimulate and resolve the latent and manifest conflict of the participants – aiming at transforming value specificity to goal specificity, so that the task at the last stage of the workshop will be more specific than that at the commencement stage.

In the value management model in Figure 1, the transformation of values into goals – as a decision-making process – comprises objective setting, objective analysis (including determining the objectives hierarchy) and alternatives evaluation. Specific value refers to the basic requirement that may be defined in previous decision point or assigned by the client in the initial stage. Value specificity influences goal setting in the decision making process, therefore specific goal is identified by the participative decision process in the value management model. Specific value (through specific goals) guides performance towards successful project outcome(s) through subsequent implementation of project management. Such project goals being set will initiate required actions towards project realization (i.e. producing an outcome).

Conflict can be systematically viewed using a structural model or a process model (Thomas, 1976). The process model considers conflict in a dynamic management process that includes $\text{Value}_{(\text{frustration})}$, $\text{Goal}_{(\text{conceptual})}$, Action and Outcome stages, while the structural model concentrates on the parties' behaviour (action). The basic concept of value management is to look for the 'best' value (translated to client's project goals) through decision making, in which latent conflict can be stimulated and solved, and a specific goal can be devised with higher commitment.

Conflict is not merely related to behaviour (e.g. a struggle), but also relates to *value* and *goal* (Rahim *et al.*, 2000). It is generally divided into two types: intra-psychic and psychosocial conflict (Rahim, 1983). Intra-psychic value–goal conflict focuses on any incompatibility within a person, while psychosocial value–goal conflict concerns incompatibility amongst persons, groups or organizations. In intra-personal conflict, sources of conflict arise from the valences of alternatives and the probability of outcome, which may involve

**Table 1** Specificity and conflict resolution in six phases of value engineering

| Phases in the value engineering[a] | Major characteristics in the value management model[b] |
|---|---|
| 1. Information | ┐ Value Specificity (assigned) |
| 2. → Function analysis | ┘ Value Specificity (assigned) |
| 3. → Creative | ┐ Conflict resolution |
| 4. → Evaluation | ┤ Conflict resolution |
| 5. → Development | ┘ Conflict resolution ┐ Goal Specificity (participated) |
| 6. → Presentation | ┘ Goal Specificity (participated) |

[a]See SAVE (1998) and Male *et al.* (1998); [b]see Figure 1.

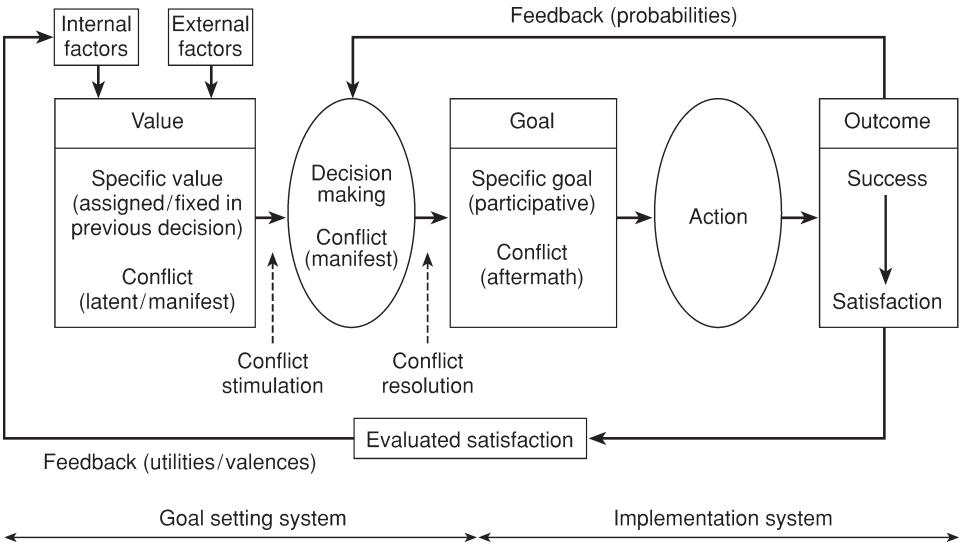


**Figure 1** A conflict model of value management

uncertainty, unacceptability and incomparability (March and Simon, 1967). The nature of conflict in the research model (see Figure 1) arises from the expected *probabilities* of options and *utilities /valences* of possible outcome at both the intrapersonal and the interpersonal level. Value conflict can be better managed when the utilities and event probabilities are clearly 'assigned' by the individual in the cognitive decision process, and the participants' satisfaction can be increased by the proximity of expected value–goal and actual value–goal.

In the construction industry, professionals exercise and contribute their particular skills, based on a variety of intrinsically different viewpoints. Though the diversity of views can be the source of creative insights (Hughes, 1994), the inherent conflict with such diversity has to be managed and resolved to lead to a satisfying decision. Conflict management comprises conflict stimulation and conflict resolution (Robbins, 1974). Conflict stimulation is initiated from the manifest conflict that is explicit in specific values. Latent conflict that is implicit in the values can be transformed into manifest conflict through stimulation techniques, e.g. brainstorming. Once the conflict (latent and manifest) is exposed in the value–goal transformation process, the conflict must be resolved in order to determine the best value appropriate for project goal setting. Conflict resolution consists of five modes: forcing, smoothing, avoiding, compromising and problem-solving (Thomas, 1976; Rahim and Magner, 1995). According to previous research, problem-solving is the best behavioural mode with which to handle conflict, while forcing is the worst (Al-Sedairy, 1994; Swierczerk, 1994; Friedman *et al.*, 2000). Excessive conflict can break the relationship among the participants, hence, moderate conflict level may be most appropriate for stimulating creative decision and improving performance and final outcome (e.g. Rahim and Bonoma, 1979).

It is postulated in the model (see Figure 1) that during the VE workshop, consensus on the best value(s) leads to formulation of project goal(s). Such project goals are viewed as decision outcome (called conflict aftermath) which are devised through successful management of conflict in the decision making process. The final outcome (such as degree of success /level of satisfaction) can be expressed as positive or negative and, via feedback, will influence the aspiration of any desired value in future projects. Such feedback is fundamental as each participant considers viable alternatives, compares with expectations, adjusts efforts in the repetition of the pre-decision, partial decision and post-decision stages (see Zeleny 1982; Liu 1997) of decision making. Hence, feedback is part of the goal–behaviour–performance–outcome cycle (Liu and Walker, 1998) that guides the individuals' behaviours (through considerations of options) towards goal attainment.

## Research plan

It is postulated that participant satisfaction is dependent on value–goal specificity and value–goal conflict levels in decision-making, hence, giving rise to the following hypotheses:

(1) *Value specificity leads to goal specificity*, i.e. the more specific the participants' desirable values are at the commencement of project goal setting,

the more specific the goal levels set. Value specificity is the level of clarity and explicitness of the value that influences goal setting (see Steers and Porter, 1983) and is expressed as a function of the relationships of the person (i.e. project participants), the object (i.e. the project) and the environment. Goal specificity refers to the level of clarity and explicitness of the goal, which relates to the definition of a target level for performance (Wofford, 1982).

(2) *Higher goal specificity and value-goal conflict resolution (by means of problem solving) lead to higher participant satisfaction*. Project goal is specified through the appropriate conflict management process. Problem solving mode is the most appropriate style in managing conflict, because it concerns both self and others inthe decision making process. Higher degree of goal specificity and greater conflict resolution (integration) can improve performance (Rahim and Bonoma, 1979) and, hence, produces satisfaction.

A questionnaire survey is adopted to identify component elements of research variables followed by detailed analyses of project cases that have undergone VM. This paper reports on the findings from the survey only to: (1) define the measurable factors used in the hypotheses; and (2) test the hypotheses based on the analysed factors (a group of variables) and individual variables.

The target respondents in this survey are project team participants who can be identified through the membership records of various professional institutions. These groups of individuals are selected on the basis of the following: (1) each is believed to be a qualified professional in the construction industry in Hong Kong; (2) he/she has direct experience in the projects key decision making process involving client/end-users and other project team members; and (3) he/she must possess experience in a (perceived) successful project. The experiences of these project participants are crucial to test /reveal the relationship of the variables in the hypotheses. A questionnaire consisting of 15 questions which related to project goals and outcome has been designed on the basis of (1) specificity dimensions (Locke and Latham, 1990), (2) conflict resolution dimensions (Rahim and Bonoma, 1979; Pinkley, 1990) and (3) satisfaction dimensions (Liu and Walker, 1998). These questions are indicated in Table 2 as v.1 to v.15. Five-point Likert scales were provided to assist respondents to express their perceptions on the specificity, conflict and satisfaction variables.

The target respondents to this survey are project team participants undertaking new building works in the major consulting firms and government departments. Ninety questionnaires are returned, representing 36% of the 250 sent out; 75 are fully completed, representing a response rate of 30% in terms of usable data. A total of 64% of the selected projects are funded by government, while the remaining 34.7% and 1.3% are private developers, or joint-venture projects respectively.

In this study, two methods, factor analysis and linear regression, are employed to group the variables into meaningful factors (i.e. a factor-reduction process) and to determine the variables associated with value specificity, goal specificity, conflict resolution and participant satisfaction.

Factor analysis refers to a class of multivariate statistical techniques used to analyse the interrelationships among a large number of variables. Its purpose is to identify the underlying dimensions or factors that account for the relationships that are observed among the variables. The techniques of factor analysis have two basic uses: firstly, to study the underlying structure of psychological constructs involving the structure of behaviour and experience; and secondly, to reduce a large number of variables to a smaller, more manageable set of data (Leary, 1991; Norušis, 1993). Due to many variables included in the questionnaire of this research, the

**Table 2** Descriptions of the hypothetical variables in the research

| Variable | Value label | Measurement |
|---|---|---|
| Assigned specificity | v.1–v.4 | Specificity in client's requirements on a Likert scale of 1–5 (very vague–very clear) |
| Goal specificity | v.5–v.9 | Specificity of project goal on a Likert scale of 1–5 (very vague–very clear) |
| Conflict resolution | v.10–v.12 | Conflict resolution amongst client, project manager and project team members on a Likert scale of 1–5 (must win/lose–very willing to integrate) |
| Satisfaction | v.13 | Satisfaction with organizational structure on a Likert scale of 1–5 (satisfaction–dissatisfaction) |
| | v.14 | Satisfaction with resource planning and control on a Likert scale of 1–5 (satisfaction–dissatisfaction) |
| | v.15 | Overall satisfaction of the project on a Likert scale of 1–5 (satisfaction–dissatisfaction) |

technique of factor analysis is used to examine whether, and, if so, how the variables considered in the questionnaire can be grouped so that their number is reduced for further evaluation using multiple regression and correlation coefficients.

In multiple regression, the values of one variable (the dependent variable Y) are estimated from those of two or more other variables (the independent variables $X_1$, $X_2$, ... $X_n$). This is achieved by the construction of a linear equation. To express the usefulness of regression equation, the multiple correlation coefficients, ranging from 0.00 to 1.00, and symbolized by the letter R, is calculated. It describes the degree of relationship between the criterion variable (Y) and the set of predictor (X) variables (Norušis, 1993; Kinnear and Gray, 1995). The major variables/factors for determination of value specificity and the participant satisfaction can be analysed by a linear regression (with 'enter' method) in testing the hypotheses.

## Results

### Factor analysis

As discussed, the responses to the questionnaire items are first factor-analysed by varimax rotation to identify the components of the variables. The major factors observed among the variables in the questionnaire are identified in Table 3. Five factors were extracted which account of 78.17% of the common variance of the 15 items. Items loading 0.50 or greater were retained in these factor if their loadings were greater than 0.50 (Rahim *et al.*, 2000). Results of this analysis (see Table 3) indicate that the items loaded on the appropriate factors, with the exception of client specificity (v.4) that shared a relatively low loading (0.328 and 0.430) with the assigned specificity (F2) and the goal specificity (F3) factors. Since all of those are lower than 0.50, client specificity (v.4) are deleted in the following data analyses.

Based on the result shown in Table 3, project specificity is divided into three main elements including 'primary value specificity (assigned)' (F1), 'secondary value specificity' (assigned) (F2) and 'goal specificity (participative)' (F3). Normally, the primary purpose of a project/investment and the client's requirements are assigned to the project team at the project commencement stage and specific project goals will then be set. Therefore, specificity is elicited in two ways, mainly: value specificity (assigned) and goal specificity (participative) is shown in Figure 2.

### Regression analysis

In order to investigate the relationship of value and goal specificity in hypothesis 1 and the relationship of goal specificity, conflict resolution and participants' satisfaction in hypothesis 2 clearly, linear regression analyses with enter method are employed in testing the hypotheses.

**Table 3** Factor analyses of hypothetical variables

| Factor label | | Variables | | Factor loading |
|---|---|---|---|---|
| | *Specificity* | | | |
| F1 | Primary value specificity (assigned) | v.1 | Specificity in prime purpose of the investment | 0.854 |
| F2 | Assigned value specificity (assigned) | v.2 | Specificity in client's requirements for budget | 0.889 |
| | | v.3 | Specificity in client's requirements for schedule | 0.880 |
| F3 | Goal specificity (participative) | v.5 | Specificity in goal setting, including type of contract | 0.924 |
| | | v.6 | Specificity in goal setting, including forms of contract | 0.903 |
| | | v.7 | Specificity in goal setting, including specification | 0.778 |
| | | v.8 | Specificity in goal setting, including degree of detailed design | 0.557 |
| | | v.9 | Specificity in goal setting, including project schedule with milestone dates | 0.501 |
| | | v.4 | Specificity in client's requirements for specification | 0.430 |
| | *Conflict resolution* | | Interpretation in resolving goal setting conflict: | |
| F4 | Win/lose vs. compromise | v.10 | between client's contact and project team | 0.917 |
| | | v.11 | between project manager and project team | 0.899 |
| | | v.12 | between client's contact and project manager | 0.881 |
| | *Satisfaction* | | | |
| F5 | Project satisfaction | v.13 | Satisfaction with organizational structure | 0.871 |
| | | v.14 | Satisfaction with resource planning and control | 0.832 |
| | | v.15 | Overall satisfaction of the project | 0.752 |

Note: Cumulative variance = 78%; Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.685 ; and Eigenvalues of F1, F2, F3, F4 and F5 = 1.085 (0.072% of variance), 1.310 (0.087%), 4.509 (0.306%), 3.195 (0.213%) and 1.627 (0.109%), respectively.

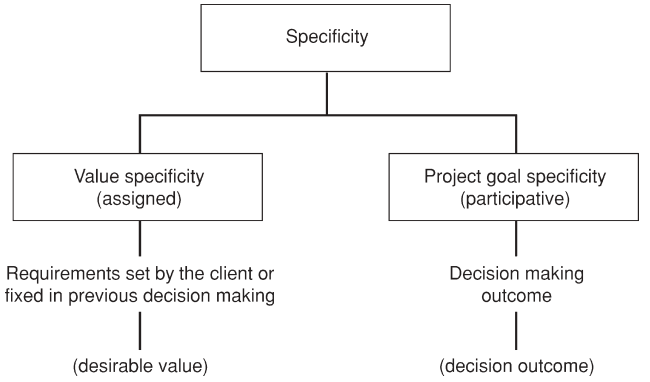


**Figure 2** Value-goal specificity

The results for the relationships between primary value specificity (assigned), secondary value specificity (assigned) and goal specificity (participative) are obtained from five multiple regression equations (see Table 4). These equations indicate that there is a significant correlation between value specificity and goal specificity (Eqs 4 and 5). Although $R^2$ is of a relative low 0.248 involving primary value specificity and goal specificity (refer Eq. 1), the relationships between (1) primary value specificity and secondary value specificity ($R^2 = 0.945$) (2) secondary value specificity and goal specificity ($R^2 = 0.724$) are strongly significant when interpreted in stages. In fact, Eq. 3 in Figure 4 shows that $R^2 = 0.998$ when primary value specificity is regressed against secondary value specificity and goal specificity. Hence, these results provide empirical support that there is significant relationship between value specificity and goal specificity.

For hypothesis 2, the relationship between participant satisfaction, goal specificity and conflict resolution is investigated by means of multiple regression (Table 5), where participant satisfaction (F5) is used as a dependent

**Table 4** Multiple regression results (for hypothesis 1)

| Eq. | Dependent variable | $R^2$ | | Variables in the equations | (Constant) *B* | Sig. |
|---|---|---|---|---|---|---|
| (1) | Primary value specificity (F3) | 0.248 | | *Goal Specificity* (refer variables in F3) | (–1.046) | 0.001 |
| | | | v.5 | Specificity in goal setting, including detailed design | –0.154 | |
| | | | v.6 | Specificity in goal setting, including project schedule | 0.471 | |
| | | | v.7 | Specificity in goal setting, including specification | –9.72E-02 | |
| | | | v.8 | Specificity in goal setting, including type of contract | –0.766 | |
| | | | v.9 | Specificity in goal setting, including form of contract | 0.821 | |
| (2) | Primary value specificity (F3) | 0.945 | | *Secondary Value Specificity* (refer variables in F2) | (–6.148) | 0.000 |
| | | | v.2 | Specificity in client's requirements for budget | 0.743 | |
| | | | v.3 | Specificity in client's requirements for schedule | 0.749 | |
| (3) | Primary value specificity (F3) | 0.998 | | *Secondary Value Specificity* (refer variables in F2) and *Goal Specificity* (refer variables in F3) | (–5.319) | 0.000 |
| | | | v.2 | Specificity in client's requirements for budget | 0.815 | |
| | | | v.3 | Specificity in client's requirements for schedule | 0.716 | |
| | | | v.5 | Specificity in goal setting, including detailed design | –0.171 | |
| | | | v.6 | Specificity in goal setting, including project schedule | 0.139 | |
| | | | v.7 | Specificity in goal setting, including specification | –0.183 | |
| | | | v.8 | Specificity in goal setting, including type of contract | –0.111 | |
| | | | v.9 | Specificity in goal setting, including form of contract | 6.613E-02 | |
| (4) | Secondary value specificity (F2) | 0.724 | | *Goal Specificity* (refer variables in F3) | (–3.216) | 0.000 |
| | | | v.5 | Specificity in goal setting, including detailed design | 0.488 | |
| | | | v.6 | Specificity in goal setting, including project schedule | 0.193 | |
| | | | v.7 | Specificity in goal setting, including specification | 0.743 | |
| | | | v.8 | Specificity in goal setting, including type of contract | 0.393 | |
| | | | v.9 | Specificity in goal setting, including form of contract | –0.922 | |
| (5) | Value specificity (including primary F1 and secondary F2) | 0.490 | | *Goal Specificity* (refer variables in F3) | (–4.262) | 0.000 |
| | | | v.5 | Specificity in goal setting, including detailed design | 0.334 | |
| | | | v.6 | Specificity in goal setting, including project schedule | 0.664 | |
| | | | v.7 | Specificity in goal setting, including specification | 0.646 | |
| | | | v.8 | Specificity in goal setting, including type of contract | –0.373 | |
| | | | v.9 | Specificity in goal setting, including form of contract | –0.101 | |

Note: F1, F2 and F3 are the factors analysed by Factor Analysis (see Table 3).

**Table 5** Multiple regression results (for hypothesis 2)

| Dependent variable | $R^2$ | Independent variables in the equation | (Constant) *B* | Sig. |
|---|---|---|---|---|
| Satisfaction (F5) | 0.402 | *Goal Specificity and Conflict resolution* (F3 & F4, refer Table 2) | (–2.768) | 0.001 |
| | | v.5 Specificity in goal setting, including detailed design | 0.575 | |
| | | v.6 Specificity in goal setting, including project schedule | 0.210 | |
| | | v.7 Specificity in goal setting, including specification | –0.333 | |
| | | v.8 Specificity in goal setting, including type of contract | –2.27E-02 | |
| | | v.9 Specificity in goal setting, including form of contract | –5.4E-02 | |
| | | v.10 Conflict resolution between client's contact & project team | 4.55E-03 | |
| | | v.11 Conflict resolution between project manager & project team | 0.447 | |
| | | v.12 Conflict resolution between client's contact & project manger | 8.48E-03 | |

Note: F3, F4 and F5 are the factors analysed by Factor Analysis (see Table 3).

variable and variables in goal specificity (F3) and conflict resolution (F4) are used as the independent variables.

The regression analysis in Table 4, which accounts for up to 40% of variance at the significance level of 0.000, indicates that goal specificity and conflict resolution are associated with participant satisfaction. Both goal specificity and conflict resolution have significant linear relationships with project satisfaction.

Conflict can provide an opportunity for the participants to think through ideas, reinforce commitment (Al-Sedairy, 1994; Swierczerk, 1994), provide better performance and improve organizational effectiveness (Rahim and Bonoma, 1979), but excessive levels of value–goal conflict can and do hinder organizational effectiveness. However, adoption of the integrative style of conflict resolution allows participants an opportunity to participate in the discussion, clarify the problems, suggest procedures and ground rules for resolving incompatibility.

## Conclusion

The model in this paper postulates that the client's requirements represent the assigned 'value specificity' in the decision process, while the project goal is considered to represent 'goal specificity' which is arrived through project members' participation in decision making. Results from the regression analyses provide a positive endorsement that goal specificity is influenced by primary value specificity and the client's requirements. In addition, goal specificity and conflict resolution are associated with the final outcome (satisfaction) in construction projects. This means that a higher degree of value–goal specificity and greater conflict resolution (integration) improve the final outcome (satisfaction) and influence the following task subsequently. The primary purpose of value management is to specify the participants' values and goals through the conflict stimulation and conflict resolution processes.

However, potential limitations in our research design should be noted. The relatively small sample used for this study may limit the generalizability of the results. However, all the respondents in this survey are identified through the membership records of various professional institutions including the Hong Kong Institute of Architect, Hong Kong Institute of Engineer and Hong Kong Institute Surveyor. They had direct experience in the construction projects in the key decision-making process. Therefore, we are assured that our results are not biased by differential response to the measured variables.

On the other hand, since lateral studies can only be effective when confounding variables are constrained and controlled, case studies are recommended to cross-validate the relationship of specificity, conflict and outcome over time. It should be emphasized that the quantitative data analysis undertaken provided the context and support for subsequent qualitative studies. Triangulation should, therefore, be employed to provide the necessary 'leverage' to assist in attaining a better understanding and generalization through exploratory case studies, lateral research and their interaction.

## References

Al-Sedairy, S.T. (1994) Management of conflict: public-sector construction in Saudi Arabia. *International Journal of Project Management*, **12**(3), 143–51.

Connaughton, J.N. and Green S.D. (1996) *Value Management in Construction: A Clients Guide*, Construction Industry Research and Information Association, London.

Dell'lsola, A.J. (1982) *Value Engineering in the Construction Industry*, 3rd edn, Van Nostrand Reinhold, New York.

Feather, N.T. (1975) *Values in Education and Society*, The Free Press, New York.

Friedman, R.A., Tidd, S.T., Currall, S.C. and Tsai, J.C. (2000) What goes around comes around: the impact of personal conflict style on work conflict and stress. *International Journal of Conflict Management*, **11**(1), 32–55.

Green, S.D. (1994) Beyond value engineering: SMART value management for building projects. *International Journal of Project Management*, **12**(1), 49–56.

Hughes, W.P. (1994) Improving the relationship between construction law and construction management, *International Conferences: Charting the Course to the Year 2000 – Together*, The First Multidisciplinary Conference on Co-operative Creative Problem Solving in the Construction Industry, University of Kentucky, USA. Available online: http://www.rdg.ac.uk./~kcshuwill/publish/kentucky.htm1#druckerx (Accessed 3 July 1998).

Katzell, R.A. (1964) Personal values, job satisfaction, and job behavior. In Borow H. (ed.), *Man in a World at Work*, Houghton Mifflin, Boston, pp. 341–63.

Kelly, J. and Male, S. (1992) Functional analysis method. *Value and the Client*. Papers in a Conference on 29 January 1992 at The Royal Institution of Chartered Surveyors, UK, pp. 13–24.

Kinnear, P. R. and Gray, C.D. (1995) *SPSS for Windows Made Simple* (revised edn), Erlbaum (UK) & Taylor & Francis, London.

Kluckhohn, C. (1959) Values and value-orientations in the theory of action. In Parsons Shils, E. A. (ed.), *Toward a General Theory of Action*, Harvard University Press, Cambridge, MA, pp. 388–433.

Lawley, D.N. and Maxwell, A. E. (1971) *Factor Analysis as A Statistical Method*, 2nd edn, Butterworth & Co. (Publishers) Ltd, London.

Leary, M.R. (1991) *Introduction to Behavioral Research Methods*, SAGE Publications, Inc., Thousand Oaks.

Lewin, K., Dembo, T., Festinger, L. and Sears, P.S. (1944) Level of aspiration. In Hunt, J.McV. (ed.), *Personality and the Behavior Disorders*, vol.1, Ronald Press, New York, pp. 333–378.

Liu, A.M.M. (1997) A model for application of conjoint analysis in value management. In Davidson C.H. and Tarek A. Abdel Meguid (eds), *Procurement – A Key to Innovation, CIB Proceeding*, CIB Publication no. 203, pp. 413–22.

Liu, A.M.M. and Walker, A. (1998) Evaluation of project outcomes. *Construction Management and Economics*, **16**(2), 209–19.

Locke E.A. and Latham G.P. (1990) *A Theory of Goal Setting and Task Performance, Prentice Hall*, Englewood Cliffs, NJ.

Locke, E.A. (1969) What is job satisfaction? *Organizational Behavior and Human Performance*, Academic Press, New York, pp. 309–36.

Male, S., Kelly, J., Fernie, M. and Bowles, G. (1998) *Value Management: The Value Management Benchmark: A Good Practice Framework for Clients and Practitioners*, Thomas Telford, London.

March, J.G. and Simon, H.A. (1967) *Conflict in Organizations*, John Wiley & Sons, Inc., USA, pp. 112–35, 213–48.

Norušis, M.J. (1993) *SPSS 7.5 Guide to Data Analysis*, Prentice Hall, Upper Saddle River, NJ.

Pinkley, R.L. (1990) Dimensions of conflict frame: disputant interpretations of conflict. *Journal of Applied Psychology*, **75**(2), 117–26.

Rahim, A. (1983) Measurement of organizational conflict. *The Journal of General Psychology*, **109**, 189–99.

Rahim, A. and Bonoma, T.V. (1979) Managing organizational conflict: a model for diagnosis and intervention. *Psychological Reports*, **44**, 1323–44.

Rahim, A., Magner, N.R. and Shapiro, D. (2000) Do justice perceptions influences styles of handling conflict with supervisions? *International Journal of Conflict Management*, **11**(1), 9–31.

Rahim, M.A. and Magner, N.R. (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**(1), 122–32.

Rescher, N. (1969) *Introduction to Value Theory*, Prentice-Hall Inc., New Jersey.

Robbins, S.P. (1974) *Managing Organizational Conflict*, Prentice-Hall, Inc., New Jersey.

Rokeach, M. (1973) *The Nature of Human Vales*, The Free Press, Collier Macmillan Publication, New York.

SAVE (1998) *Function Monographs*, SAVE International 'The Value Society'. Available online: http://www.value-eng. com/pdf/funcmonograph.html (accessed 3 July 1999).

Steers, R.M. and Porter, L.W. (1983) *Motivation and Work Behavior*, McGraw-Hill Book Company, New York.

Swierczek, F.W. (1994) Culture and Conflict in Joint V entures in Asia. *International Journal of Project Management*, **12**(1), 39–41.

Thomas, K. (1976) Conflict and conflict management. In Dunnette, M.D. (ed.), *Handbook of Industrial and Organizational Psychology*, Rand McNally College Publishing Company, Chicago, pp. 889–935.

Walker, A. (1996) *Project Management in Construction*, 3rd edn, Blackwell Science Ltd., Oxford.

Winch, G., Usmani, A. and Edkins, A. (1998) Towards total project quality: a gap analysis approach. *Construction Management and Economics*, **16**, 193–207.

Wofford, J.C. (1982) Experimental tests of the goal-energy-effort requirement theory of work motivation. *Psychological Reports*, **50**, 1259–1273.

Zeleny, M. (1982) *Multiple Criteria Decision Making*. McGraw-Hill Book Company, New York.