TRUST: ONE DIMENSION OR TWO?

Carmel Herington
Griffith University

Track: Market Orientation and Relationship Marketing

Introduction

Trust is a concept which has received extensive attention in the marketing literature (for example, Doney & Cannon 1997; Ganesan 1994; Ganesan & Hess 1997; Moorman, Deshpandé & Zaltman 1993; Morgan & Hunt 1994; Shemwell & Cronin 1995). Trust has received particular attention as a key concept in relationship marketing (for example, Morgan & Hunt 1994). Two competing models have generally been utilised to represent the trust concept. Whilst trust has frequently been measured using a unidimensional model (for example Doney & Cannon 1997; Dwyer, Schurr & Oh 1987; Larzelere & Huston 1980; Morgan & Hunt 1994, more recently attention has been given to using a two-dimensional approach to modelling the concept (for example Bowen & Shoemaker 1998; Ganesan 1994; Ganesan & Hess 1997; Kumar,Scheer & Steenkamp 1995). Two dimensions, representing benevolence and credibility (or honesty) are the most usually identified separate dimensions of trust. Hence, the decision as to how best to measure trust in marketing related research is confusing, given the equally successful approaches to modelling the concept reported in the literature.

Despite this confusion, trust continues to play an important part in marketing research. Having been identified as a key variable in assessment of relationship marketing models (for example Morgan and Hunt 1994), trust is consistently being utilised in increasingly complex relationship marketing models. Therefore, it is important to find some consensus as to how best to measure trust in relationship marketing, especially as the models develop and grow. In addition, treatment of trust as multi-dimensional adds to the complexity of the model building and assessment. Such complexity may be unnecessary, if a two-dimensional model does not provide a substantially better fit than a unidimensional model.

Hence, this paper focuses on examining the dimensionality of trust by examining two different measures of trust. The paper also assess empirically Doney and Cannon's (1997) assertion that trust is better treated as a unidimensional construct.

The measurement of trust (literature review)

Kumar et al (1995), Bowen and Shoemaker (1998) and Ganesan and Hess (1997) have all posited trust as consisting of two separate dimensions; credibility (or honesty) and benevolence. And certainly, a majority of definitions of trust entail the belief in the reliability (benevolence) and integrity (credibility) of the relationship partner (for example Ganesan 1994; Ganesan & Hess 1997; Hennig-Thurau & Hansen 2000; Moorman, Deshpandé & Zaltman 1993; Morgan & Hunt 1994; Rotter 1967). Morgan and Hunt (1994, p. 23) summarised the literature on trust as suggesting that "…confidence on the part of the trusting party results from the firm belief that the trustworthy party is reliable and has high integrity, which are associated with such qualities as consistent, competent, honest, fair, responsible, helpful and benevolent".

Ganesan (1994) and Ganesan and Hess (1997) based their two-dimenisonal trust model on the identification of credibility and benevolence as being distinctive components. They justified this by arguing that credibility is faith in the abilities of the relationship partner, whilst benevolence is the belief that the motives and intentions of the other partner are honourable. Ganesan and Hess (1997) provided evidence of a good fitting model. Bove and Johnson (2000) and Siguaw, Simpson and Baker (1998) have subsequently found support for this model.

Likewise, Kumar, Scheer and Steenkamp (1995) also developed and found support for their similar two-dimensional trust model, and subsequent support has been reported by other researchers (for example Wetzels, de Ruyter & van Bergelen 1998). They justified their position using the social psychology literature. However, whilst the literature they referenced does mention two essential elements of trust, it should be noted that Larzelere and Huston (1980), nevertheless, still treated trust as unidimensional.

Alternatively, Doney and Cannon (1997) noted that with both of these scales, although support for the discriminant validity of the two dimensions was reported, both dimensions were highly correlated. Doney and Cannon (1997, p.43) suggested that this might mean that benevolence and credibility "may be so intertwined that in practice they are operationally inseparable". This would support Larzelere and Huston's (1980) position of treating these elements as different aspects of trust rather than separable dimensions.

It has been previously noted that although a good fit might be found for a proposed outcome model, the data might be better represented by other models (Anderson & Gerbing 1988; Bollen 1989; Byrne 1994; MacCallum 1995). Other researchers such as Bollen (1989), Byrne (1994), Hull, Tedlie and Lehn (1995), Hoyle (1995), MacCallum (1995), Maruyama (1998), Mulaik and James (1995) and Anderson and Gerbing (1988) describe model assessment procedures involving the specification and estimation of plausible alternative models to the proposed theoretical model, with Kelloway (1998) stating that "the focus of assessing model fit almost invariably should be on comparing the fit of competing and theoretically plausible models (p.39)". Such an approach has not been used with regards to the assessment of the two-dimensional trust scales, despite evidence within the literature supporting an alternative single-factor model. And yet, such an approach might serve to solve the confusion about the two opposing models. Hence, this research utilises these two recent and important measures of trust to further examine the dimensionality of the trust concept, based on their well-established psychometric properties, frequency of their use and lack of comparison with a competing single-factor model.

Methodology

Assessment of the scales is based on two randomly selected sample sets of 200 cases, each extracted from a larger dataset of employees from a single firm. Respondents covered the gamut of positions and levels within a large, successful tourism firm. They were typical of the services industry, being mostly female (73%), aged 20-29 (53%) and working with their employer for an average of three years. This was done to overcome problems encountered with χ^2 in large sample sizes (Baumgartner & Homberg 1996; Hair et al. 1995), whilst still being large enough to accommodate the preferred ratio of ten observations for each estimated parameter for structural equation modelling (Hair et al. 1995). The use of two samples also enabled cross-validation of results (DeVellis 1991; Fabrigar et al. 1999; Maruyama 1998). The survey was administered as a self-complete on-line survey. Responses to individual items

of the questionnaire were captured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

EQS was used for all analyses. Analysis commenced with maximum likelihood confirmatory factor analysis because the dimensionality of the two scales was previously well-established (Gerbing & Anderson 1988). As recommended by Anderson and Gerbing (1982) and Hair et al (1995), the unidimensionality of each factor was assessed first. Comparisons of the scales were based on the use of the Akaike Information Criteria (AIC), and model fit indices. The AIC is a recommended statistic to compare different models using the same data (Ullman 2001), as it accounts for both fit and the number of parameters (Bentler 1995; Byrne 1994). A smaller AIC is generally indicative of a better fit and greater parsimony (Hair et al 1995) and hence a more useful model (Bentler 1995).

Results

Using the first random sample (Sample 1), analysis commenced using confirmatory factor analysis to examine the fit of the data to the Ganesan trust scale. Results of the analyses are presented in Table 1 (columns 2-4). An acceptable fit was found for the two separate factors (S-B $\chi^2_{(df)}$ = 44.65$_{(20)}$, p = 0.001, CF1* = 0.93, SRMR = 0.05, α = 0.86 for credibility; $\chi^2_{(df)}$ = 23.08$_{(2)}$, p = 0.001, CF1 = 0.94, SRMR = 0.05, α = 0.79 for benevolence) as well as for the overall second order factor model (S-B $\chi^2_{(df)}$ = 40.35$_{(52)}$, p = 0.88, CF1* = 1.00, SRMR = 0.04). The AIC (4.51) was small for the overall model, indicating a parsimonious model.

Table 1 - Fit indices for the Ganesan trust scale

1	2	3	4	5	6	7	8	9
	Sample 1				Sample 2			
Fit index	Credibility	Benevolence	2 factor, 1 higher order factor solution	Single factor	Credibility	Benevolence	2 factor, 1 higher order factor solution	Single factor model
χ^2(df)	54.523(20)	23.077(2)	108.507 (52)	113.551 (54)	36.454 (20)	23.074(2)	120.181(53)	93.577 (54)
P*	0.001	0.001	0.001	0.001	0.01359	0.001	0.001	0.001
S-B χ^2	44.6532	-	40.3494	98.7053	28.2562	15.7291	86.2809	76.8701
P*	0.00123	-	0.87986	0.00020	0.10347	0.00038	0.00262	0.02212
* CFI	0.931	-	1.000	0.948	0.967	0.886	0.929	0.951
CFI	0.951	0.938	0.959	0.957	0.962	0.892	0.916	0.951
SRMR	0.045	0.048	0.040	0.041	0.041	0.068	0.046	0.039
χ^2/df	2.2							
GFI	0.946	0.960	0.938	0.936	0.959	0.941	0.906	0.925
NFI	0.926	0.933	0.925	0.922	0.920	0.885	0.862	0.930
α	0.856	0.789	0.9042	0.9042	0.831	0.751		.9031
AIC	14.52259	19.07685	4.50701	4.55122	3.54582	19.07485	14.18087	14.42320

In order to confirm the overall plausibility of the model, a single factor model was also assessed against the data. This single factor model also provided an acceptable fit to the data (S-B $\chi^2_{(df)}$ = 98.71$_{(54)}$, p = 0.00, CF1* = 0.95, SRMR = 0.04, α = 0.90) and an equally parsimonious solution (AIC = 4.55).

The second sample dataset was then used as a confirmatory test of the model. Results are reported in Table 1 (columns 6-9). Again, the unidimensionality of each of the two factors

was assessed and supported, using confirmatory factor analysis. An acceptable fit was also found for the two factor, one higher-order factor model (S-B_^{2}$_{(df)}$ = 86.28$_{(54)}$, p = 0.003, CF1* = 0.93, SRMR = 0.05, AIC = 14.18). Once again, an similarly acceptable fit was also found for a competing single factor model (S-B_^{2}$_{(df)}$ = 76.87$_{(54)}$, p = 0.02, CF1* = 0.95, SRMR = 0.04, α = 0.90, AIC = 14.42).

The second trust scale of Kumar, Scheer and Steenkamp (1995) was then assessed for fit and parsimony. As with the Ganesan scale, analysis commenced with an examination of the two previously identified dimensions of the scale, using the first sample dataset. All results are reported in Table 2 (columns 2-5). An acceptable fit to the data was found for the separate dimensions (S-B_^{2}$_{(df)}$ = 1.73$_{(2)}$, p = 0.42, CF1* = 1.00, SRMR = 0.01, α = 0.76 for credibility; S-B_^{2}$_{(df)}$ = 9.93$_{(5)}$, p = 0.08, CF1*= 0.99, SRMR = 0.02, α = 0.87 for benevolence), although some overfitting of the data was present for the credibility dimension with the _^{2}/df = 0.93 (Hair et al 1995). The two factor model also provided an acceptable fit to the data (S-B_^{2}$_{(df)}$ = 14.32$_{(25)}$, p = 0.96, CF1* = 1.00, SRMR = 0.02, AIC = 14.65). Assessment of a competing single factor model against the dataset also provided a good fit (S-B_^{2}$_{(df)}$ = 35.58$_{(27)}$, p = 0.12, CF1* = 0.99, SRMR = 0.03, α = 0.90, AIC = 8.33).

Table 2 – Fit indices for the Kumar, Scheer and Steenkamp trust scale

1	2	3	4	5	6	7	8	9
	Sample 1				Sample 2			
Fit index	Credibility	Benevolence	2 factor, 1 higher order factor solution	Single factor	Credibility	Benevolence	2 factor, 1 higher order factor solution	Single factor
_^{2}(df)	1.860(2)	12.925(5)	35.350(25)	45.670(27)	0.032(2)	7.973(5)	44.686(26)	52.993(27)
*P**	0.39451	0.02409	0.08205	0.01380	0.98395	0.15773	0.01274	0.00202
S-B_^{2}	1.7264	9.9303	14.3176	35.5804	0.0376	5.7970	27.2698	41.2211
*P**	0.42180	0.07723	0.95591	0.12477	0.98138	0.32647	0.39529	0.03921
* CFI	1.000	0.987	1.000	0.988	1.000	0.997	0.998	0.976
CFI	1.000	0.988	0.991	0.984	1.000	0.994	0.980	0.972
SRMR	0.014	0.024	0.024	0.028	0.002	0.021	0.035	0.039
_^{2}/df	0.9	2	0.6	1.3	0.02	1.6	1.04	
GFI	0.997	0.982	0.974	0.966	1.000	0.984	0.947	0.937
NFI	0.994	0.980	0.971	0.962	1.000	0.984	0.953	0.944
_	0.761	0.871		0.898	0.879	0.802	-	0.91
AIC	2.13978	2.92472	14.64980	8.32978	3.96765	2.02703	7.31379	1.00670

Findings were also similar using the second, confirmatory sample, dataset to assess the Kumar, Scheer and Steenkamp (1995) scale. The two dimensions were each found to provide a satisfactory fit (S-B_^{2}$_{(df)}$ = 0.04$_{(2)}$, p = 0.98, CF1* = 1.00, SRMR = 0.002, α = 0.88 for credibility; S-B_^{2}$_{(df)}$ = 5.80$_{(5)}$, p = 0.33, CF1*= 1.00, SRMR = 0.02, α = 0.80 for benevolence). However, evidence of overfitting was again found for the credibility factor (_^{2}/df = 0.02). The single factor model was then assessed against the fit of the data from Sample 2, with an acceptable fit being found (S-B_^{2}$_{(df)}$ = 41.22$_{(27)}$, p = 0.04, CF1* = 0.98, SRMR = 0.04, α = 0.91, AIC = 1.01).

O particular note, in the case of the Kumar, Scheer and Steenkamp (1995) scale, the AIC was much lower for the single factor model than the two-dimensional model (AIC = 8.32 for the single scale versus AIC = 14.65 for the two-dimensional model for Sample 1; AIC = 1.01 for the single scale versus AIC = 7.31 for the two-dimensional model for Sample 2).

Discussion and Conclusions

The results of the assessment indicate that an acceptable fit for both two-dimensional models was found. This indicates in the first instance that the scales did in fact perform as previously for both scales. And, as these scales have been treated previously, the examination could have concluded at that point.

However, the question this paper asks is whether the two-dimensional models actually provided the best solution. This is the assessment which has frequently not been considered in previous trust research. For both scales, a single factor model was found to represent the data just as well as the two-dimensional, second order model and in fact much better for the Kumar scale. Using the principal of parsimony, one has to conclude that both scales might actually be best represented by unidimensional models (Hull, Lehn & Tedlie 1991).

There is considerable supporting evidence in the literature for trust to be treated as unidimensional (for example Chenet, Tynan & Money 2000; Doney & Cannon 1997; Dorsch, Swanson & Kelley 1998; Dwyer, Schurr & Oh 1987; Larzelere & Huston 1980; Morgan & Hunt 1994; Rempel, Homes & Zanna 1985; Rotter 1967; Shemwell & Cronin 1995; Zineldin & Jonsson 2000). Many of these scales also measured the same elements of benevolence and credibility which have been distinguished as separate dimensions by Ganesan (1994) and Kumar, Scheer and Steenkamp (1995).

It could be argued that the results might be unique to the data, which provides a limitation to the research. Future research using new data will overcome this limitation. In addition, particular support is found in the literature where Doney and Cannon (1997) treated trust as unidimensional. They acknowledged findings that credibility and benevolence could be conceptually distinct. However, they treated trust as unidimensional because the two dimensions were also consistently found to be highly correlated, stating that this might be due to the dimensions being so intertwined that in practice they are operationally inseparable.

Hence, the findings present a suggestion to researchers that it is important to not only assess the fit of our proposed models, but to also assess equally theoretically plausible models to ensure that we are supporting the most parsimonious model.

Future research includes replication of this study using new data from a variety of situations, such as different industries and types of organisations. In addition, assessment of aspects of nomological and construct validity is also warranted. This would provide further assessment of the dimensionality of trust within the broader context of a model that includes antecedents and consequences of trust.

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