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# How Often Versus How Long

## The Interplay of Contact Frequency and Relationship Duration in Customer-Reported Service Relationship Strength

Tracey S. Dagger  
*University of Queensland*

Peter J. Danaher  
Brian J. Gibbs  
*Melbourne Business School*

This study investigates the effects of customer contact frequency and relationship duration on customer-reported relationship strength (CRRS). We embed our analysis of these two relationship-quantity variables within a larger model that considers the effects of relationship-quality variables—commitment, trust and satisfaction—on CRRS. We additionally control for customer demographics and service type. Using a fully national sample of 591 service consumers, we find that both contact frequency and relationship duration have a positive effect on CRRS, and that duration moderates the effect of frequency. Specifically, we observe a relationship-maturity effect: for shorter-duration relationships, contact frequency enhances CRRS, but for longer-duration relationships, contact frequency has no effect on CRRS. Furthermore, employing an iso-contact analysis, we find that for relationships with about the same number of total contacts, those with longer duration are perceived to be stronger, while those with greater contact frequency are not.

**Keywords:** *service relationship; relationship strength; relationship duration; contact frequency*

Make new friends, but keep the old;  
One is silver and the other is gold.  
New-made friendships, like new wine,  
Age will mellow and refine.

—Girl Scout song, also attributed to  
Dr. Joseph Parry

The benefits of creating and maintaining strong customer relationships are now well established (Gwinner, Gremler, and Bitner 1998; Palmatier et al. 2006). Strong relationships equate with greater customer loyalty and retention (Gwinner, Gremler, and Bitner 1998), which ultimately results in higher sales, market share, and profits (Crosby, Evans, and Cowles 1990; Morgan and Hunt 1994). Given the importance of strong customer relationships, firms need to understand the factors that are associated with customer perceptions of relationship strength (Bove and Johnson 2000; Crosby, Evans, and Cowles 1990; Palmatier et al. 2006).

Strong customer relationships do not just happen overnight; they evolve over time and repeated encounters (Cooil et al. 2007; Czepiel 1990). Through this process both parties learn and adjust due to shared experiences (Altman and Taylor 1973; Bell, Auh, and Smalley 2005), trust and commitment develop (Czepiel 1990; Doney and Cannon 1997; Palmatier et al. 2006), and satisfactory experiences

serve to reinforce customer loyalty (Cooil et al. 2007). Certainly, few customers would perceive their relationship with a service provider to be strong if they were often dissatisfied with the service or could not trust the provider. Commitment, trust, and satisfaction might thus be regarded as basic ingredients of a strong relationship.

Even more basic than these variables relating to relationship *quality* are two objective variables relating to relationship *quantity*, namely, contact frequency (the number of customer contacts per period of time) and relationship duration (the length of time the relationship has existed). Drawing on the obvious analogy with interpersonal relationships (Swann and Gill 1997), it would be expected that having a strong relationship typically depends on having sufficient contact frequency and relationship duration. However, these fundamental relationship-quantity variables are often only regarded as ancillary to commitment, trust, and satisfaction in forming strong relationships. Consequently, few published studies have examined the impact of contact frequency and relationship duration per se on relationship strength (Palmatier et al. 2006). Moreover, a critical issue that has not been addressed is how frequency and duration *interactively* affect the strength of a relationship. For example, how commensurable are contact

frequency and relationship duration? Consider the case of two customers with the same overall quantity of contact with a service provider. One customer has a 1-year relationship with the service provider and has monthly contact with the provider, while the other customer has only yearly contact, but the relationship spans a 12-year period. Both customers have the same number of total contacts (frequency times duration), but do they consider their relationships with their providers equally strong?

The purpose of this study is to examine how customer contact frequency and relationship duration together influence customer-reported relationship strength (CRRS). This fundamental issue has not been addressed by prior empirical studies, despite the acknowledged importance of frequency and duration to developing strong relationships (Doney and Cannon 1997; Palmatier et al. 2006) and despite the recognition that relationships evolve through an incremental process of time and encounters (Altman and Taylor 1973; Cooil et al. 2007).

We propose, as a conceptual starting point, the principle that CRRS is a positive function of the simple quantity of relationship between the customer and service provider. That is, we hypothesize that contact frequency and relationship duration both have positive effects on CRRS. However, we also propose that relationship duration has an inordinate influence on customer perceptions of CRRS (Alba and Hutchinson 1987; Bolton 1998; Boulding, Kalra, and Staelin 1997; Collopy 1996; Hsee 1996; Hsee et al. 1999; Nicholson, Compeau, and Sethi 2001; Yeung and Soman 2007), and this gives rise to our two critical hypotheses. First, we hypothesize a relationship-maturity effect: an interaction between frequency and duration such that the effect of contact frequency on relationship strength diminishes at longer relationship durations. Second, we hypothesize a *para-contact* duration effect, whereby there is a positive effect of duration on CRRS over and above its effect on total contacts. In other words, we predict an asymmetric trade-off favoring duration over frequency such that, for relationships with about the same number of total contacts, customers will perceive high-duration, low-frequency relationships as stronger than low-duration, high-frequency relationships. Finding that these hypotheses hold would have important implications for firms' decisions about how to manage their customer relationships. Firms aware of the greater relative importance of relationship duration in making relationships strong could use this result to manage their relationships with customers. For example, a historically low-contact but high-duration customer likely needs less "maintenance" than one that has recently taken up the firm's services.

Thus, we address the issue of the interplay between contact frequency and relationship duration more thoroughly than has prior research, and we seek to provide a deeper understanding of how these relationship-quantity variables affect CRRS. Given the wider network of relationship issues commonly studied in the services literature, we embed our examination of frequency and duration within a larger model that also considers the effects of commitment, trust, and satisfaction on CRRS and controls for customer demographics and three different business-to-consumer service categories. In the following sections, we discuss these variables and develop our research hypotheses.

## Customer-Reported Relationship Strength and Its Antecedents

Relationship strength is the extent, degree, or magnitude of the association between a customer and service provider (Barnes 1997; Shemwell and Cronin 1995), and various terms have been used to describe it, including relationship closeness, quality, intensity, and depth (Barnes 1997). Irrespective of the terminology used, a strong relationship with a firm or its staff has been found to lead to customer loyalty and retention (Gwinner, Gremler, and Bitner 1998; Palmer and Bejou 1994) and ultimately higher sales, market share, and profits (Crosby, Evans, and Cowles 1990; Morgan and Hunt 1994). In the present research, we take a direct approach and focus on relationship strength as perceived and reported by the customer. CRRS emphasizes that the best definition of a strong relationship is that provided by the relationship partners themselves (Barnes 1997). This conception of relationship strength is thus behaviorally based, and so a relationship is considered weak or strong depending on, in the case of our study, customers' reporting of the felt strength of the relationship they have with their service provider.

### Relationship-Quantity Variables: Contact Frequency and Relationship Duration

Frequency of contact is the number of interactions per period between exchange partners (Crosby, Evans, and Cowles 1990; Doney and Cannon 1997; Palmatier et al. 2006). In the present study, we use the term *contact frequency*, but this variable is also referred to in the literature as frequency of interaction (Homburg and Stock 2004; Nicholson, Compeau, and Sethi 2001); and it has been used to capture or reflect interaction intensity (Crosby, Evans, and Cowles 1990), relationship depth (Bolton, Lemon, and Verhoef 2004), and relationship experience (Bolton, Kannan, and Bramlett 2000). Contact

frequency is generally measured as the number of actual transactions that occur over a period of time (Bolton, Kannan, and Bramlett 2000; Homburg and Stock 2004) or assessed as part of a self-report scale measuring level of interaction and communication between exchange partners (Crosby, Evans, and Cowles 1990; Doney and Cannon 1997; Nicholson, Compeau, and Sethi 2001). We take the former approach and measure contact frequency as the number of customer-provider interactions estimated over a period of time (one year).

Several studies have examined the effects of interaction frequency on relationship constructs. Repeated interactions have been found to assist in developing relational bonds, which build customer loyalty (E. Anderson and Weitz 1989; E. W. Anderson and Sullivan 1993). The frequency of interaction between relational partners reflects effort, or commitment to the relationship (Nicholson, Compeau, and Sethi 2001), and this effort is a key determinant of relationship continuity (Crosby, Evans, and Cowles 1990). Conversely, a strong relationship is unlikely to develop in situations where there is limited interaction between a buyer and seller. As a consequence, interaction frequency should be closely associated with CRRS (Crosby, Evans, and Cowles 1990). We therefore hypothesize a frequency effect.

*Hypothesis 1:* The greater the frequency of contact in a relationship, the higher will be the customer-reported level of relationship strength.

The duration of a relationship is the length of time that a relationship between exchange partners has existed (Cooil et al. 2007; Palmatier et al. 2006). Relationship duration corresponds to customer retention (versus defection), which can be considered the probability that a customer continues (versus ends) the relationship with an organization (Bolton, Lemon, and Verhoef 2004). In the present study, we generally use the term *relationship duration* (Claycomb and Frankwick 2004; Lee et al. 2004), but other terms have also been used in the literature, including relationship age (Kumar, Scheer, and Steenkamp 1995; Verhoef, Franses, and Hoekstra 2002) and relationship length (Bolton, Lemon, and Verhoef 2004; Cooil et al. 2007). Consistent with the literature, we measure relationship duration as the length of time that the customer-firm relationship has existed (Cooil et al. 2007; Palmatier et al. 2006).

Various studies have considered the time-dependent effect of relational constructs from a social psychology and/or marketing perspective (Doney and Cannon 1997; Swann and Gill 1997; Verhoef, Franses, and Hoekstra

2002). Studies in social psychology show that people in long-term relationships have more opportunities to gather information about one another, more motivation to acquire information (Berscheid et al. 1976), and more motivation to integrate that information into coherent representations (Murray and Holmes 1993) compared to individuals in the early stages of relationship development. Similarly, marketing studies show that long-term relationships are more stable than younger relationships (E. Anderson and Weitz 1989) because time allows for unsatisfactory relationships to end and for adjustments to occur in surviving relationships so that they achieve a higher degree of relational fit (E. Anderson and Weitz 1989) or familiarity (Verhoef, Franses, and Hoekstra 2002).

Over time, relationship partners are also better able to predict behavior, as the outcomes of previous episodes provide a framework for subsequent interactions (Doney and Cannon 1997; Nicholson, Compeau, and Sethi 2001). The longer a relationship continues, the greater the investment both parties make in the relationship (Doney and Cannon 1997; Grayson and Ambler 1999) and the greater the opportunity for experience-based benefit to accrue (Hannan and Freeman 1984). Because relationship investments represent value to exchange partners, the length of time that a relationship has existed may correspond to greater levels of relationship value (Yeung and Soman 2007) and hence to a stronger customer-provider relationship (Palmatier et al. 2006). Thus, CRRS may reasonably be expected to be a function of the length of the customer-provider relationship, and we therefore hypothesize a duration effect.

*Hypothesis 2:* The longer the duration of a relationship, the higher will be the customer-reported level of relationship strength.

## The Interaction of Frequency and Duration

We propose that the way in which duration and frequency influence CRRS is more complex than can be captured by main effects alone. Relationships are evolutionary, time-adjusted associations that develop through repeated interactions between exchange partners (Cooil et al. 2007). The nature of this process is incremental, with customers updating their perceptions over the duration of the relationship (Bolton 1998). At an abstract level, the notion of relationship investment (Doney and Cannon 1997; Kumar, Scheer, and Steenkamp 1995) is captured both by the frequency with which relationship partners interact (Crosby, Evans, and Cowles 1990; Nicholson, Compeau, and Sethi

2001) and by the duration of the relationship (E. Anderson and Weitz 1989; Doney and Cannon 1997).

We suggest that while the strength of a relationship may increase with both relationship duration and contact frequency, the importance of contact frequency diminishes as the duration of the relationship increases. This conjecture is consistent with research by Boulding, Kalra, and Staelin (1997) and Bolton (1998), who found that as customers gain more experience over time, they weigh early assessments of the service more heavily, placing less emphasis on later experiences. It is also consistent with the finding that younger buyer-seller relationships require more frequent interaction than older buyer-seller relationships due to the need for lengthy norm development in the early relationship phases (Nicholson, Compeau, and Sethi 2001). Furthermore, it may be the case that long-term customers have experienced market and firm cyclic effects, such as management change, takeovers and layoffs, all of which contribute to the internal culture of a firm. This deeper level of service experience and understanding can generally only be appreciated by genuinely long-term customers, as even high-contact customers over a short duration (e.g., one year) cannot have been exposed to the spectrum of these cyclic effects. As a result, once a relationship has reached a certain level of maturity, it becomes less dependent on actual customer-provider contact to remain strong. Simply stated, over time, customer contact will have diminishing returns in terms of customer perceptions of relationship strength. We therefore hypothesize a relationship-maturity effect.

*Hypothesis 3:* Relationship duration moderates the effect of contact frequency such that contact frequency will enhance CRRS more when relationship duration is short than when relationship duration is long.

Finally, relationship duration may play a special, incremental role in strong relationships over and above its role (in combination with contact frequency) in determining the total number of contacts between the customer and provider. Attribute-evaluability theory suggests that decision makers rely more heavily on easily evaluated attributes when making consumption evaluations (Alba and Hutchinson 1987; Hsee 1996; Hsee et al. 1999); and the duration attribute is relatively easy for consumers to evaluate, in part because it presents itself in the marketplace in a way that provides information about its effective range, neutral reference point, and/or value distribution. Consistent with this, in the context of computer-usage judgments, Collopy (1996) found that clients' self-reports of their system usage levels are driven more by simple duration information (connect time) than by their actual amount of interactive use of the system. Furthermore, Yeung and Soman (2007) found that

consumers use the duration cue as a way of simplifying the process of evaluating services; and duration could similarly function as a convenient heuristic cue in judgments of relationship strength as well. Thus, while contact frequency and relationship duration together determine the total number of contacts between the customer and service provider (i.e., total contacts = frequency × duration), and we obviously expect higher numbers of total contacts to correspond to higher levels of relationship strength, we also expect duration to have an additional, separable effect on CRRS. Specifically, we predict an asymmetric trade-off between frequency and duration in favor of duration: Controlling for total number of contacts, higher duration relationships will be stronger, while higher frequency relationships will not. That is, we hypothesize an asymmetric frequency-duration trade-off effect.

*Hypothesis 4:* Among relationships with the same number of total contacts, longer relationship duration will be associated with greater CRRS, but higher contact frequency will not.

### **Relationship-Quality Variables: Commitment, Trust and Satisfaction**

Although the primary focus of our study is on relationship-quantity variables, and specifically on the interplay of contact frequency and relationship duration in determining CRRS, we formulate our frequency and duration hypotheses within a wider set of relations commonly studied in the service relationship literature. Accordingly, we incorporate the role of commitment, trust and satisfaction in strengthening relationships, treating these relationship-quality constructs as akin to control variables.<sup>1</sup>

*Commitment* is the consumer's voluntary willingness to remain in and make efforts towards maintaining a relationship<sup>2</sup> (De Wulf, Odekerken-Schröder, and Iacobucci 2001; Morgan and Hunt 1994; Palmatier et al. 2006) and can be thought of as the foundation on which relationships are built (Berry and Parasuraman 1991). Committed customers experience relationship closeness (Geyskens, Steenkamp, and Kumar 1999; Verhoef, Franses, and Hoekstra 2002), which over time leads to confidence about the relationship (Gill, Swann, and Silvera 1998). Based on the relationship literature, which suggests that commitment drives relationship quality (Wong and Sohal 2002) as well as the key service outcomes of attitudinal loyalty (Rauyruen and Miller 2007), behavioral intentions (Rosenbaum, Massiah, and Jackson 2006), and word-of-mouth intentions (Brown et al. 2005), we expect that as commitment increases so too will CRRS.

*Trust* is the consumer's confident belief in the reliability and integrity of a service provider (Crosby, Evans, and Cowles 1990; De Wulf, Odekerken-Schröder, and Iacobucci 2001; Morgan and Hunt 1994; Palmatier et al. 2006) and has been considered the basis of relationship stability (Garbarino and Johnson 1999). Trust captures the belief that the seller will stand by its word (J. Anderson and Narus 1990) and fulfill promised role obligations (Dwyer, Schurr, and Oh 1987; Scheer and Stern 1992). Trust promotes long-term relationships by reducing uncertainty and the likelihood of opportunistic behavior (Hausman 2001). We expect that increased trust will lead to higher CRRS. We base this expectation on findings that trust drives relationship quality (Wong and Sohal 2002) and important service outcomes including loyalty (Rauyruen and Miller 2007), referrals (Verhoef, Franses, and Hoekstra 2002), and behavioral intentions (Rosenbaum, Massiah, and Jackson 2006).

*Satisfaction* is a key aspect of buyer-seller relationships (Crosby, Evans, and Cowles 1990; De Wulf, Odekerken-Schröder, and Iacobucci 2001) and is critical to relationship continuity (E. W. Anderson and Sullivan 1993). In the present study, we do not limit our definition of satisfaction to an appraisal of only the service relationship; rather we construe satisfaction as the customer's affective appraisal of the overall service itself (E. W. Anderson, Fornell, and Lehmann 1994; Oliver 1997; Verhoef, Franses, and Hoekstra 2002). We expect that higher levels of satisfaction will yield greater CRRS. Satisfaction may relate to the customer's continuing the relationship as well (Nicholson, Compeau, and Sethi 2001), but irrespective of any effect on relationship duration or contact frequency, we expect a main effect of satisfaction on CRRS. This follows from previous findings that satisfaction drives loyalty (Rauyruen and Miller 2007), referrals (Verhoef, Franses, and Hoekstra 2002), and behavioral (Rosenbaum, Massiah, and Jackson 2006) and word-of-mouth intentions (Brown et al. 2005).

### Control Variables: Service Type and Customer Demographics

The customer relationship literature points to the possible effects of service type on relationship strength. Gwinner, Gremler, and Bitner (1998), for example, suggested that the importance and degree to which relational benefits are received depends on the type of service being considered. Similarly, Barnes (1997) posited that relationship development may depend on the nature of the industry in which a service firm operates. In short, some service types may be more conducive to fostering

strong customer-firm relationships (Lovelock, Patterson, and Walker 2007). It would be expected, for example, that closer relationships form with the family doctor than with a fast-food outlet. Hence, in the present research, we control for service-type influences on CRRS.

Likewise, the literature indicates possible effects of customer demographics on relationship strength, and we consider the impact of age, sex, education and income (Patterson 2007; Jones, Mothersbaugh, and Beatty 2000). Age is particularly relevant to us because relationship duration is likely to be confounded with an individual's age (Barnes 1997; Berscheid, Snyder, and Omoto 1989). For example, it is unlikely that customers aged 20 will have service relationships of as long duration as a customers aged 60.

A pictorial summary of the above discussion is given in Figure 1.

## Research Method

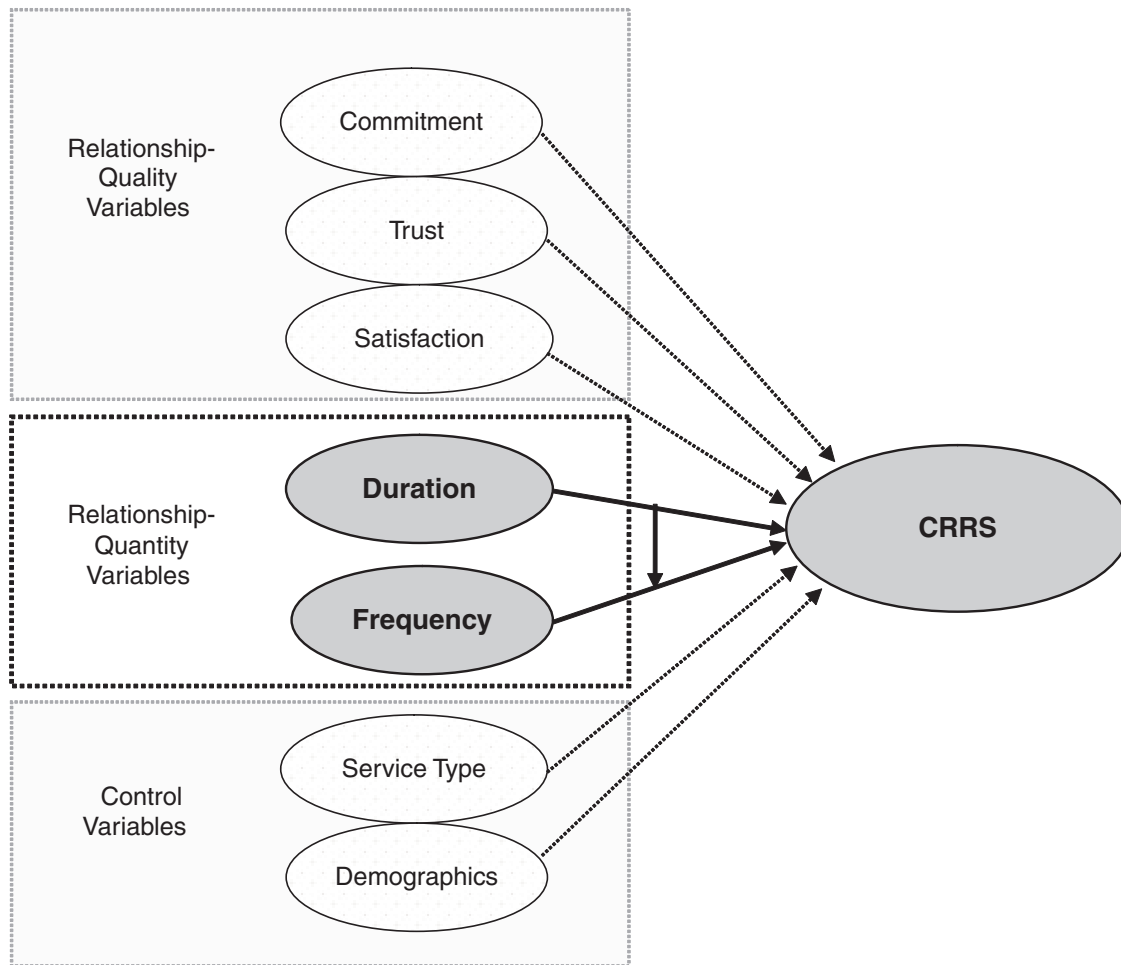
### Questionnaire and Sample

Because customer-provider relationships are important across a range of service industries, we did not focus on a single industry but included nine service provider types in our study. Following Gwinner, Gremler, and Bitner (1998), we used Bowen's (1990) classification typology to ensure that we selected services from a wide range of industries. While there are a number of typologies for grouping services available in the literature (e.g., Kellogg and Chase 1995; Lovelock 1983; Silvestro et al. 1992), Bowen's typology is one of the few with an empirical underpinning. Specifically, three high-contact, *customized* services (travel agents, hairdressers, and family doctors); three moderate-contact, *semicustomized* services (photo printing service, general banking, and pest control); and three moderate-contact, *standardized* services (cinemas, airlines, and fast-food outlets) were selected for inclusion in the study. Specific services were chosen based on the exemplars supplied by Bowen and the recommendations of Gwinner, Gremler, and Bitner.

The questionnaire, which had been piloted on a representative sample of 30 consumers, had three versions corresponding to the Bowen (1990) categories given above. The questionnaire cover page listed just three service industries, all from the same Bowen category, and asked respondents to "choose one service provider from the following list that you feel you have a current relationship with." The remainder of the questionnaire evaluated aspects of only that service provider.<sup>3</sup>

A fully national sample of 3,000 people aged 18 or older in Australia was selected via a systematic random draw

**Figure 1**  
**Conceptual Model of the Antecedents to Customer-Reported Relationship Strength (CRRS)**



from a commercially available mailing list. Questionnaires were posted to these addresses in mid-July 2007 and were returned throughout the subsequent 6 weeks. Some 68 questionnaires were “returned to sender” because the intended recipient had left without a forwarding address. In total, 591 usable questionnaires were returned, resulting in a response rate of  $591/(3000 - 68) = 20.2\%$ , which is at the upper end of the response-rate range typical in postal surveys of consumers (Dillman 2007).

Table 1 shows the distribution of responses across the service industries and reveals that banks, family doctor, airlines, hairdressers, and fast-food outlets dominate as popular service providers with whom customers have formed relationships; at the level of the Bowen (1990) typology, no one service category dominates. Table 2 shows the demographic profile for the sample, which is

reasonably balanced by gender and is well spread over age, income, and education groups.

### Measures

Where possible, the measures used in this study were adapted from existing scales. Our CRRS, frequency, and duration measures use a self-report format.

*Customer-reported relationship strength* is the perceived extent, degree, or magnitude of the association between the customer and service provider (Barnes 1997; Shemwell and Cronin 1995). We conceptualize CRRS as a behavioral variable, not unlike share-of-wallet (Keiningham, Perkins-Munn, and Evans 2003; Mattila 2006) or job performance (Cummings, Jackson, and Ostrom 1989). Accordingly, CRRS was measured by directly asking

**Table 1**  
**Summary Statistics for Contact Frequency and Relationship Duration**

Questionnaire Version	Service Type	Customer-Reported Relationship Strength (CRRS): Mean	Number of Respondents	Frequency of Contact (Times per Year)		Duration of Relationship (Years)		Total Contacts (Frequency × Duration)	
				Mean	Median	Mean	Median	Mean	Median
1	Travel agency	4.68	23	7.9	3.0	3.8	1.0	26.8	4.0
1	Hairdresser	4.77	66	9.2	8.5	5.6	3.0	61.4	20.0
1	Family doctor	5.17	116	10.5	6.0	11.0	8.8	103.3	45.0
2	Photo processing	3.77	23	15.4	12.0	3.0	2.0	34.9	19.0
2	Bank	4.63	185	107.9	96.0	15.2	12.0	1598.5	82.5
2	Pest control	4.20	5	1.0	1.0	10.3	6.5	10.3	6.5
3	Cinema	4.07	41	24.7	24.0	11.2	10.0	246.8	134.3
3	Airline	4.09	71	6.8	3.0	13.1	10.0	123.8	40.0
3	Fast food	4.05	61	50.0	32.0	6.7	4.6	344.1	180.0
	Overall	4.55	591	45.5	12.0	10.9	7.6	602.0	84.0

**Table 2**  
**Demographic Profile (N = 591)**

	Percentage
Gender	
Male	43
Female	57
Age	
15–24	25
25–34	10
35–44	11
45–54	18
55–64	18
65+	18
Income	
<20k	37
≥20k to <40k	24
≥40k to <60k	21
≥60k to <80k	8
≥80k	10
Education	
High school	43
Technical	25
University	32

customers to assess the strength of their relationship with a service provider on an 8 point scale, where 0 represented *no relationship*, 1 represented a *weak relationship*, and 7 represented a *strong relationship*. Support for the use of self-report measures in the business literature (Cummings, Jackson, and Ostrom 1989; Heneman 1974; Lysonski 1985), recognition of the value of behavioral variables such as share-of-wallet (Keiningham, Perkins-Munn, and Evans 2003; Mattila 2006), and support for the predictive

validity of single item measures (Bergkvist and Rossiter 2007) together argue for the viability of our CRRS measure. Following Gwinner, Gremler, and Bitner (1998), the term *relationship* was not defined but left open for the respondent to interpret.

*Contact frequency* is defined as the number of interactions per unit of time between exchange partners (Crosby, Evans, and Cowles 1990; Doney and Cannon 1997; Palmatier et al. 2006). As we were interested in capturing user-defined contact levels, we allowed respondents to attach their own meaning to the term *contact*. This is important because the nature of contact between the firm and customer is likely to differ depending on the type of service and characteristics of the individual customer. Our single-item measure asked respondents, “Approximately how frequently have you been coming to or using this service provider?” Response options included the number of contacts per week, month, or year, and we standardized these to be the number of contacts per year. Importantly, we did not tie the estimation of frequency to the past 12 months but simply asked for a general estimate over a period of time. This avoids the problem of a customer’s having had an anomalously high or low level of interaction over any given predetermined period of time (e.g., the *previous* 12 months). Also note that contact can be customer- or firm-generated, so our measure is flexible enough to permit respondents to make their own interpretation of contact frequency, although the likelihood is that survey respondents interpret our measure as being customer-initiated contact.

*Relationship duration* is defined as the length of time that the relationship between the exchange partners has

existed (Bolton, Lemon, and Verhoef 2004; Cooil et al. 2007; Palmatier et al. 2006). We note that this definition is behavioral rather than emotional in that it reflects the length of time a customer has been retained by the organization. The term *relationship* is used to represent the spectrum of relationship phases—from functional beginnings through to a more evolved stage of relationship development. Our single-item measure asked respondents, “Approximately how long have you been coming to or using this service provider?” Answers were coded into years for the purpose of analysis.

*Commitment* is defined as the consumer’s voluntary willingness to remain in, and make efforts toward, maintaining a relationship (De Wulf, Odekerken-Schröder, and Iacobucci 2001; Morgan and Hunt 1994; Palmatier et al. 2006). Three items were adapted from Hennig-Thurau, Gwinner, and Gremler (2002) to form our commitment scale.

*Trust* is defined as the consumer’s belief in the reliability and integrity of a service provider (Crosby, Evans, and Cowles 1990; De Wulf, Odekerken-Schröder, and Iacobucci 2001; Morgan and Hunt 1994; Palmatier et al. 2006). Four items were adapted from Morgan and Hunt (1994) and Doney and Cannon (1997) to form our trust scale.

*Satisfaction* is defined as the customer’s affective appraisal of the consumption experience (E. W. Anderson, Fornell, and Lehmann 1994; Hennig-Thurau, Gwinner, and Gremler 2002; Oliver 1997; Verhoef, Franses, and Hoekstra 2002). Satisfaction was measured on a three-item scale adapted from Oliver (1997) and Hennig-Thurau, Gwinner, and Gremler (2002). The exact wording of the items measuring relationship strength, commitment, trust, and satisfaction are given in Appendix A.

## Reliability and Validity of Measures

A correlation matrix of the constructs and variables in Figure 1 is given along with summary statistics in Table 3. The measures used in the study were subjected to confirmatory factor analyses. The result of these analyses supported the distinctions among the satisfaction, trust, and commitment constructs. Cronbach’s alpha indicated that these scales could be used with confidence, with reliabilities of .93, .97, and .93, respectively, for commitment, trust, and satisfaction. Analysis of the measurement model resulted in adequate fit, and all items were found to serve as strong measures of their respective constructs,  $\chi^2(32) = 127.66$ ,  $p = .00$ , confirmatory fit index (CFI) = .99, incremental fit index (IFI) = .99, root mean square error of approximation (RMSEA) = .07. Furthermore, analysis also indicated high levels of construct reliability and average variance extracted for all latent variables. As all  $t$  values were significant ( $p < .01$ ) and the average variances

extracted were greater than .50, convergent validity was established. Discriminant validity between the constructs was established through Fornell and Larcker’s (1981) stringent test. Given these findings, composites were created for commitment, trust, and satisfaction by averaging the scores over the corresponding items (Bagozzi and Foxall 1996; Bagozzi and Heatherton 1994).

## Results

### Summary Statistics

Table 1 gives the average frequency of contact (times per year) and duration of relationship (in years) for each service type. Not surprisingly, it shows that the longest relationships are with banks, airlines, and family doctors. A less obvious long-duration relationship turns out to be with cinemas. High contact frequency occurs for banks, cinemas, and fast food, as might be expected. Also notice that the means are larger than the medians, indicating that the data are skewed to the right, with some customers having very high contact-frequency or relationship-duration levels in each of the service categories.

A further consideration is the possible correlation between frequency of contact and relationship duration, where again banks score highly on both measures. However, Table 3 shows that the correlation between frequency of contact and relationship duration across all nine service types is .20, which is relatively low.

### Test of Hypotheses

Our hypotheses are tested in the context of the overall conceptual model depicted in Figure 1, which is mathematically described by a regression model, as follows.

$$RS_i = \alpha + \beta_1 F_i + \beta_2 D_i + \beta_3 F_i \times D_i + \beta_4 \text{Commitment}_i + \beta_5 \text{Trust}_i + \beta_6 \text{Satisfaction}_i + \beta_7 \text{Service\_Category}_i + \beta_8 \text{Demographics}_i + \varepsilon_i \quad (1)$$

where  $F_i$  is frequency of contact and  $D_i$  is duration of the relationship. Although there are nine service industries, as listed in Table 1, we group them into the three established Bowen (1990) categories of personalized, semi-customized, and standardized services. As a result,  $\text{Service\_Category}_i$  is one of two dummy variables indicating the Bowen category for the service evaluated by person  $i$ . The baseline Bowen category is standardized services. The demographic variables are those listed in Table 2 and were dummy-coded when appropriate.<sup>4</sup>

Because the frequency, duration, commitment, trust, and satisfaction variables are on different scales, we

**Table 3**  
**Correlation Matrix for the**  
**Constructs and Variables in Figure 1**

	Customer- Reported Relationship Strength (CRRS)	Commitment	Trust	Satisfaction	Frequency
Commitment	.56**				
Trust	.47**	.62**			
Satisfaction	.49**	.61**	.81**		
Frequency	.08*	-.03	-.14**	-.11*	
Duration	.23**	.20**	.01	-.02	.20**
Mean	4.55	4.41	5.43	5.29	—
SD	1.68	1.62	1.29	1.26	—

\* $p < .05$ . \*\* $p < .01$ .

normalize each of them by subtracting its mean and dividing by its standard deviation. We also normalize the dependent variable CRRS. As a result, the reported regression coefficients for these variables are the standardized (beta) coefficients.

Table 4 gives the estimated regression coefficients for the model in Equation 1. We checked for possible multicollinearity problems by calculating variance inflation factors for each independent variable. None exceeded 3.5, which is well below the recommended upper limit of 10 (Hair et al. 1998). Therefore, collinearity does not appear to influence our results. Notice also that the  $R^2$  value, at 42%, is relatively high for a cross-sectional study and indicates that this set of antecedent variables is reasonably good at explaining the variation in relationship strength.

Of the key variables, Table 4 shows that commitment, trust, and satisfaction are significant<sup>5</sup> at the 5% level. Hence, all three of the relationship-quality constructs play a role in driving CRRS for our range of service industries. It is worth commenting that the  $t$  statistics for commitment, trust, and satisfaction are among the largest<sup>6</sup> in Table 4, and so these constructs are crucial elements of relationship strength, as previously demonstrated by De Wulf, Odekerken-Schröder, and Iacobucci (2001).

The main effects of frequency and duration are statistically significant and positive, supporting Hypotheses 1 and 2. In addition, the interaction between frequency and duration is significant, and negative. This means that as either frequency or duration increases, the direct main effect of the other variable on CRRS is attenuated. That is, both frequency and duration are potential moderators of the link between frequency and CRRS and between duration and CRRS.

**Table 4**  
**Regression Results for the Model in Equation 1**

Variable	Estimated Coefficient <sup>a</sup>	Standard Error	$t$ Statistic	$p$ Value
Intercept	-.11	.12	-0.88	.38
Frequency	.18	.04	4.55	.00
Duration	.19	.04	5.30	.00
Frequency $\times$ Duration	-.08	.03	-2.55	.01
Commitment	.29	.04	6.91	.00
Trust	.15	.06	2.74	.01
Satisfaction	.20	.05	3.58	.00
Customized	.37	.08	4.39	.00
Semicustomized	.03	.09	0.36	.72
Standardized	0	—	—	—
Gender (female)	.09	.07	1.27	.20
Age	-.004	.002	-1.74	.08
Income				
<20k	0	—	—	—
$\geq$ 20k to <40k	.06	.09	0.68	.50
$\geq$ 40k to <60k	.18	.09	1.92	.06
$\geq$ 60k to <80k	.17	.13	1.31	.19
$\geq$ 80k	.26	.12	2.09	.04
Education				
High school	0	—	—	—
Technical	-.03	.08	-0.32	.75
University	.03	.08	0.35	.72

Note:  $R^2 = .42$ ,  $F(16, 565) = 25.59$ ,  $p < .0001$ ,  $n = 582$ .

a. Estimated coefficients for frequency, duration, commitment, trust, and satisfaction are standardized coefficients.

To the extent possible, we validate our regression model findings using a LISREL method to model latent variable interactions.<sup>7</sup> Using this approach, we specify an alternative model that considers the interrelationship between commitment, trust, and satisfaction. Full details are given in Appendix B. In sum, they show that frequency, duration, and their interaction have a significant effect on CRRS, in precisely the same way as found by our regression model approach.

We now test to see which of frequency or duration acts as the dominant moderator. In doing so, we continue only with the regression method.

### Moderation Test

To get an initial perspective on the relative moderation effects of frequency and duration, we place each survey respondent into low and high categories of frequency and duration based on a median split of these two variables. Figure 2 plots the mean CRRS values at each of the low/high conditions for frequency and duration. It is

apparent that at low duration there is a significant difference in mean CRRS between low and high contact frequency (3.9 vs. 4.4, respectively,  $p < .01$ ). However, for the high-duration condition, the mean CRRS values at low and high contact frequencies are the same (both are 5.0). In contrast, the reverse pattern is not observed. That is, at low frequency levels, there is a significant difference between mean CRRS values for low and high duration (3.9 vs. 5.0, respectively,  $p < .001$ ), and this difference remains significant at high frequency levels (4.4 vs. 5.0, respectively,  $p < .01$ ), despite getting smaller (1.1 down to 0.6). In sum, Figure 2 shows that associations between frequency and CRRS and between duration and relationship strength are moderated, respectively, by duration and frequency. However, the two moderation effects are not symmetric, with duration being a stronger moderator of frequency than vice versa.

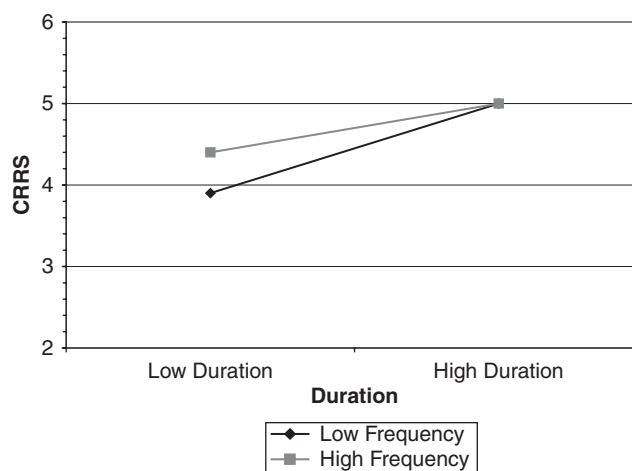
While the data depicted in Figure 2 give some initial evidence that duration is a stronger moderator than frequency, the foregoing analysis ignores the concomitant effects of the relationship-quality, control, and demographic variables. A more thorough analysis requires the use of a regression model based on our complete conceptual model, as given in Equation 1. In Appendix C, we demonstrate how Equation 1 can be adapted to test for the relative dominance of the moderation effects of frequency and duration.<sup>8</sup> The resultant test uses the estimated regression coefficients for just frequency, duration and their interaction. As shown in Appendix C, to demonstrate that duration moderates the association between frequency and CRRS, but that frequency does not moderate the association between duration and CRRS, four conditions must hold:

$$\begin{aligned} \beta_1 &> 0 \\ \beta_1 + \beta_3 &= 0 \\ \beta_2 &> 0 \\ \beta_2 + \beta_3 &> 0. \end{aligned} \quad (2)$$

We tested the conditions in Equation 2 by fitting the regression model in Equation 1, but with the frequency and duration variables operationalized as low/high dummy variables based on median splits, as above.

The main effects of frequency and duration are statistically significant and positive ( $\hat{\beta} = .63$ ,  $p < .001$ ;  $\hat{\beta} = .93$ ,  $p < .001$ ). Moreover, the test of  $\beta_1 + \beta_3 = 0$  gives an  $F$  statistic of 2.91 ( $p = .09$ ), showing that the sum of these coefficients is not significantly different from 0. Finally, the test of  $\beta_2 + \beta_3$  gives an  $F$  statistic of 13.36 ( $p < .001$ ), showing this sum of coefficients is positive. Hence, all four components of the test summarized in Equation 2 are

**Figure 2**  
Customer-Reported Relationship Strength (CRRS) for Low and High Frequency and Duration Levels



satisfied, and we can conclude that the initial results also generalize to the complete regression model. Relationship duration dominates over contact frequency in determining CRRS. That is, CRRS increases as the duration of the relationship grows, even at high levels of contact frequency; but in contrast, CRRS increases with contact frequency only when relationship duration is relatively short, not once the relationship has become established over time. In other words, in support of our third hypothesis, the importance of contact frequency diminishes as relationship duration increases, to the point where it eventually has no significant influence on CRRS.

Last, note from Table 4 that the customized service coefficient is significantly different at the 5% level from semicustomized and standardized service types. Also notice that the only significant demographic variable is income, with the medium- and highest-income groups having significantly stronger relationships than the low-income group.

### Iso-Contacts

Figure 2 and the moderation test suggest that duration plays a more important role than frequency when customers form perceptions of the strength of a relationship they have with a service provider. As further evidence of the dominance of duration, we now consider the situation in which the total customer-firm contacts are the same, but the combinations of frequency and duration that comprise these total contacts (contacts = frequency × duration) are different. For example, one person sees a service provider

monthly but has been with the provider for just 1 year, whereas another person sees a provider only twice per year but has been with that provider for 6 years. Both customers have 12 total contacts. A reasonable question might be, “Do these two customers consider their relationships to be equally strong?” If not, then as we hypothesized, does the customer with the longer relationship duration experience greater relationship strength (for equivalent levels of commitment, trust, and satisfaction)? To answer this question, we calculated the total number of contacts for each person in our data set, and then created five quintiles of total contacts. Respondents within the same quintile have approximately the same number of total contacts with their service provider, so we call these quintiles “iso-contacts.”

A regression model similar to Equation 1, but incorporating the iso-contact levels,<sup>9</sup> is

$$RS_i = \alpha + \beta_1 F_i + \beta_2 D_i + \beta_3 \text{Contact\_Dummies}_i + \beta_4 \text{Commitment}_i + \beta_5 \text{Trust}_i + \beta_6 \text{Satisfaction}_i + \beta_7 \text{Service\_Category}_i + \beta_8 \text{Demographics}_i + \varepsilon_i \quad (3)$$

and is used to see if there are any remaining frequency or duration effects given a particular total-contact level has been achieved. For instance, if  $\beta_2 > 0$  in Equation 3, this would be evidence that even allowing for an equal number of contacts for different people and service types, a longer relationship duration results in a stronger CRRS. If, additionally,  $\beta_1 = 0$ , this would indicate that duration matters, but frequency of contact does not, conditional on customers having (approximately) the same number of contacts. We fit this regression model, and the results are given in Table 5. This table shows that, indeed, duration effects are significant ( $p = .04$ ), while frequency effects are not ( $p = .11$ ), controlling for the number of total contacts. This supports our fourth hypothesis.

Figure 3 illustrates how CRRS varies across the iso-contact levels as a function of frequency and duration. Evident are several plateaus, which correspond to the iso-contact levels. For instance, the highest plateau is for consumers with more than 730 total contacts with the service provider. The hyperbolic-curved section of this highest plateau corresponds to the various different ways that frequency and duration can combine to produce total contacts of 730 (e.g., frequency = 36.5 and duration = 20 years, or frequency = 146 and duration = 5 years). Notice also that this plateau is not completely flat, but increases in the direction of rising duration, showing that, even for people with the same number of contacts, a longer length of relationship increases their perception of the strength of that relationship with their service provider. However,

**Table 5**  
**Regression Results for the Model in Equation 3**

Variable	Estimated Coefficient <sup>a</sup>	Standard Error	t Statistic	p Value
Intercept	-.60	.15	-4.12	.00
Frequency	.08	.05	1.62	.11
Duration	.09	.04	2.06	.04
Contact <sub>1</sub>	0	—	—	—
Contact <sub>2</sub>	.35	.10	3.48	.00
Contact <sub>3</sub>	.65	.11	5.99	.00
Contact <sub>4</sub>	.65	.12	5.39	.00
Contact <sub>5</sub>	.68	.18	3.87	.00
Commitment	.25	.04	6.00	.00
Trust	.16	.05	2.93	.00
Satisfaction	.20	.05	3.74	.00
Customized	.46	.08	5.49	.00
Semicustomized	.03	.09	0.28	.78
Standardized	0	—	—	—
Gender (female)	.08	.07	1.14	.25
Age	-.004	.002	-2.17	.03
Income				
<20k	0	—	—	—
≥20k to <40k	.10	.09	1.11	.27
≥40k to <60k	.17	.09	1.92	.05
≥60k to <80k	.19	.13	1.53	.13
≥80k	.30	.12	2.52	.01
Education				
High school	0	—	—	—
Technical	-.02	.08	-0.19	.85
University	.05	.08	0.63	.53

Note:  $R^2 = .45$ ,  $F(19, 562) = 24.59$ ,  $p < .0001$ ,  $n = 582$ .

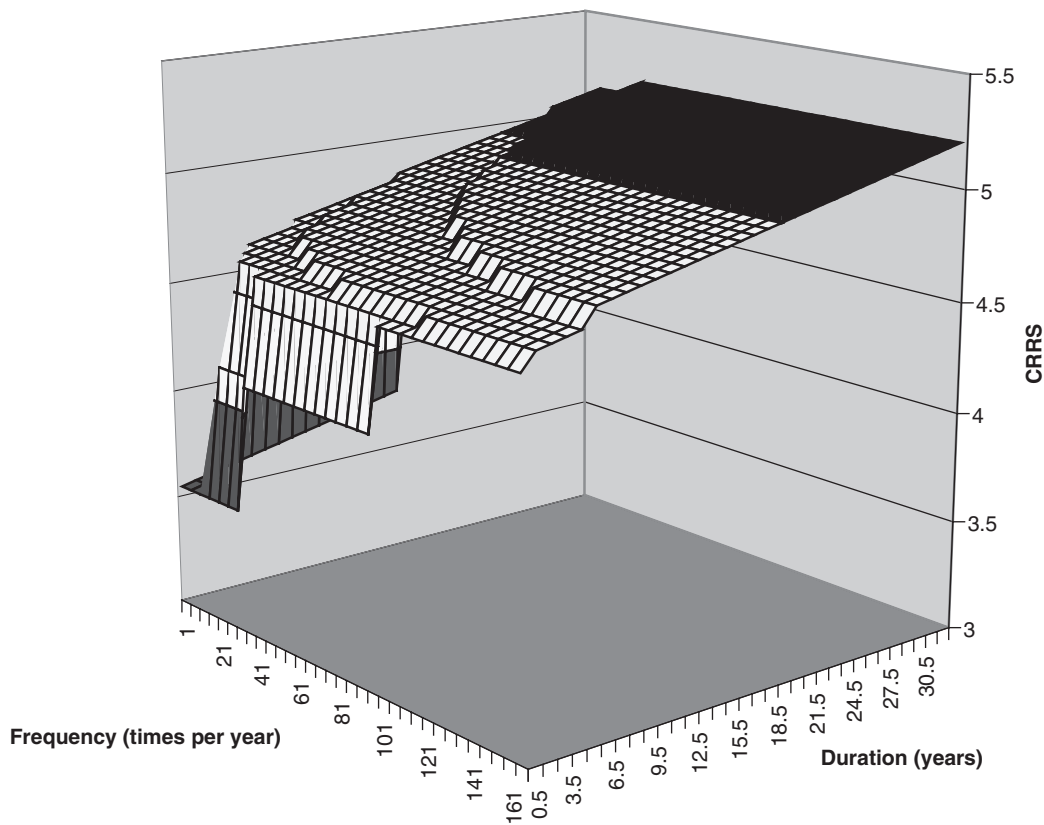
a. Estimated coefficients for frequency, duration, commitment, trust, and satisfaction are standardized coefficients.

there is no apparent change in CRRS for increasing frequency of contact. This demonstrates how duration is more important than frequency in the formation of customers' perceptions of relationship strength.

## General Discussion and Conclusions

Our study empirically advances understanding of the relation between the quantity of a service relationship and CRRS in four ways. First, our findings indicate that both contact frequency and relationship duration have a positive effect on CRRS and that duration moderates the effect of frequency. Specifically, for shorter duration relationships, contact frequency enhances CRRS; but for longer duration relationships, contact frequency has little influence on CRRS. Thus, when a relationship is young, relationship strength can be enhanced by increasing frequency of contact, but this is not the case for mature relationships, in which customer perceptions of relationship

**Figure 3**  
**Customer-Reported Relationship Strength (CRRS) Versus Contact Frequency and Duration for Five Iso-Contact Levels**



strength are driven more by relationship duration than contact frequency. Suppose, for example, that a firm observes historical behavior of infrequent contact by a customer, but that customer has been patronizing the firm for a long time. In some circumstances, this might be a cause for concern. However, as long as there is evidence of similar contact frequency, the firm need not be alarmed that the customer's perception of relationship strength is waning. The firm can reinforce this perception of CRRS by emphasizing the enduring nature of the relationship.

Second, by controlling for total number of contacts, our analysis reveals that duration has its own incremental effect on CRRS. Whereas frequency and duration both increase CRRS indirectly, by increasing total contacts, only duration also increases CRRS directly, above and beyond its impact on total contacts. The total number of contacts a customer has had with a firm is the product of the length of the relationship and the frequency of contact, but customers with the same number of total contacts can achieve that total in different ways. One

customer may have high frequency and low duration, while another may have low frequency and high duration, and the firm might reasonably believe that it has generated the same amount of service experience with the two customers. We find in our analysis, however, that for customers within the same iso-contact band, duration of the relationship has a significant positive effect on perceived relationship strength, but frequency of contact has no such effect. That is, accounting for the total number of contacts customers have had with a firm, those customers with greater relationship duration report their relationships with the firm to be stronger, while those customers with greater contact frequency do not.

These findings have strategic implications for service firms. The maturity effect implies that early on in a service relationship, the firm can strengthen that relationship by facilitating more frequent contact between itself and the customer.<sup>10</sup> However, once the relationship matures over time, more frequent contact no longer enhances relationship strength; in contrast, relationship duration does continue to contribute to relationship strength even

at higher levels of contact frequency. Moreover, the asymmetric trade-off we discovered that favors duration over frequency suggests that, for a given investment in total customer contacts, service providers can create stronger relationships by working on maintaining and highlighting relationship duration rather than on encouraging contact frequency. In fact, managers aiming to achieve high CRRS could make the decision “up front” to allocate their fixed supply of service resources more toward duration-based strategies than toward frequency-based ones. For example, to remind the customer of the longevity of the relationship, banks, retail stores, and airlines could prominently use the “member since” tactic in communications with card holders, frequent shoppers, or frequent flyers. Similarly, hairdressers, dentists, doctors, and the like could send reminder cards to their customers that function less to encourage customer contact than to make relationship duration salient. Service providers, in general, should date “membership” from the earliest possible point of association and design notices, statements, and other communication materials to highlight the customer’s tenure with the firm. Because information on duration and/or frequency is relatively easy for firms to acquire via their customer information systems, these strategic implications of our findings could be efficiently implemented in practice.

Third, because we integrated our examination of contact frequency and relationship duration within the wider system of relationship constructs commonly studied in the services literature and included in our model the effects of commitment, trust, and satisfaction on CRRS, our conclusions regarding the relationship-quantity variables take into account the effects of the major relationship-quality variables. By the same token, we are able to examine the relationship-quality variables while taking relationship quantity into account, and in this controlled analysis commitment, trust and satisfaction are seen to be important drivers of relationship strength, as previously identified in the literature (e.g., De Wulf, Odekerken-Schröder, and Iacobucci 2001). In our research model incorporating both relationship-quantity and relationship-quality variables, five factors emerged as the strongest drivers of perceived relationship strength: commitment, duration, frequency, satisfaction, and trust (in descending order of effect strength). Furthermore, using a LISREL approach to modeling latent variable interactions, we were also able to show that our findings hold even when accounting for the interrelationship between commitment, trust, and satisfaction.

Fourth, our analysis found that CRRS was stronger for customized services (travel agents, hairdressers, and family doctors) than for semicustomized (photo printing,

general banking, and pest control) and standardized services (cinemas, airlines, and fast-food outlets). The finding that these service categories are differentially conducive to fostering strong customer-firm relationships suggests that relationship development depends on the nature of the industry in which a service firm operates (Barnes 1997; Gwinner, Gremler, and Bitner 1998). The finding that CRRS is higher for customized services than for semicustomized or standardized services is not surprising given that these services are highly personalized and often result in a relationship being developed with an individual service provider. We note, however, that even though CRRS is higher for customized services, this does not alter our core findings regarding the effects of contact frequency and relationship duration on CRRS.

Overall, we conclude that managers concerned with developing strong customer-firm relationships should attend to both the relationship-quantity and the relationship-quality antecedents of perceived relationship strength that were revealed in the present study. In particular, our examination of the interplay of frequency and duration in determining relationship strength consistently demonstrates the more important role played by duration.

## Limitations and Future Research

Although we obtained a fully national sample in one market, and examined nine service types that are indicative of the range of services available in the marketplace, replication in other markets and with additional service categories would further increase confidence in our findings. As our study focuses on services that have a varying degree of interpersonal contact, research examining the role of contact frequency and duration on CRRS for service delivered wholly by technology would provide an interesting contrast to our study. While customer self-reports are common in the business literature, a useful extension of the research would be to verify our findings using objective records of the key relationship-quantity antecedents of perceived relationship strength.

Because the purpose of our study was to examine the effect of frequency and duration on CRRS, our model is limited to a subset of possible constructs. Future research could consider, for example, the role of price, value, and sacrifice in predicting CRRS. It may also be that customers’ expectations of relationship development, as well as their perceptions of relationship importance, could affect the customer-firm relationship and thereby change the associations between relationship quantity and CRRS that we observed. In this study, we define relationship duration

and contact frequency based on behavioral measures. We recognize, however, that service relationships potentially have an emotional component, so future studies could attempt to separate emotional and behavioral effects. Another future enhancement is to establish whether the relationship is with an individual or the firm.

Finally, our findings point to the potential for an interesting program of experimental work, which could manipulate the presentation and salience of duration information as a means of increasing customers' perceptions of relationship strength, even in the absence of changes in the actual quality or quantity of the service relationship. Our findings also give rise to several questions about the nature of the contact between the service provider and customer, namely, whether having contact with the same employee affects CRRS, whether the "pattern" of contact changes as the relationship matures, whether the quality of contact affects CRRS, and whether firm-initiated and customer-initiated contact differ in their effect on CRRS.

### Appendix A

#### Item Measures for Relationship Strength, Commitment, Trust, and Satisfaction

Construct	Items
Relationship strength <sup>a</sup>	On the following scale, how would you rate your relationship with this service provider?
Commitment <sup>b</sup>	My relationship with the service provider is very important to me My relationship with the service provider is something I really care about My relationship with the service provider deserves my maximum effort to maintain
Trust <sup>b</sup>	This service provider can be trusted This service provider can be counted on to do what is right This service provider has high integrity This service provider is trustworthy
Satisfaction <sup>b</sup>	I am always delighted with this service provider's service Overall I am satisfied with this service provider I feel good about using this service provider

a. Scale for relationship strength: 0 = *no relationship*, 1 = *weak relationship*, 7 = *strong relationship*.

b. Scales for commitment, trust, and satisfaction: 1 = *strongly disagree*, 7 = *strongly agree*.

### Appendix B

Here, we validate our regression model findings using a LISREL method. It allows us to maintain a multiple indicator approach and to examine interrelationships between trust, commitment, and satisfaction while modeling the frequency/duration interaction. We begin by replicating our regression analysis using LISREL. That is, we examine the direct effects of frequency, duration, commitment, trust, and satisfaction on customer-reported relationship strength (CRRS). We also examine the effect of the frequency and duration interaction term on our outcome variable using the guidelines recommended by Ping (1995, 1996a, 1996b, 1996c). The model has adequate fit to the data,  $\chi^2 = 178.47(60)$ , incremental fit index (IFI) = .98, confirmatory fit index (CFI) = .98, root mean square error of approximation (RMSEA) = .06. The findings show that the direct effects of frequency and duration ( $\beta = .13, p < .05$ ;  $\beta = .15, p < .05$ , respectively) on CRRS are significant and positive, and the interaction between these variables is significant and negative ( $\beta = -.07, p < .05$ ). As with our regression analysis, commitment, trust, and satisfaction ( $\beta = .33, p < .05$ ;  $\beta = .13, p < .05$ ;  $\beta = .21, p < .05$ , respectively) are significant drivers of CRRS.

We now additionally specify a model that allows for interrelationships between trust, commitment, and satisfaction. Specifically, we posit satisfaction as influencing commitment and trust (Caceres and Paparoidamis 2007); trust as influencing commitment (Caceres and Paparoidamis 2007; Ulaga and Eggert 2006); and trust, commitment, and satisfaction as directly influencing CRRS. The model fits the data adequately,  $\chi^2 = 232.48(66)$ , IFI = .98, CFI = .98, RMSEA = .07; and findings indicate that satisfaction drives both commitment ( $\beta = .33, p < .05$ ) and trust ( $\beta = .83, p < .05$ ) and that trust has a significant impact on commitment ( $\beta = .32, p < .05$ ). Importantly, allowing for these interrelationships between the constructs does not alter our main findings that frequency and duration ( $\beta = .13, p < .05$ ;  $\beta = .16, p < .05$ , respectively) have a direct impact on CRRS and that the interaction term ( $\beta = -.07, p < .05$ ) associated with these variables is significant and negative. Thus, our analysis of latent variable interactions supports our regression findings: As frequency or duration increase, the impact of the other variable on CRRS decreases.

## Appendix C

We isolate just the frequency and duration variables in Equation 1 and set the remaining independent variables at their mean levels. This results in a simplified regression model as follows.

$$RS = \alpha + \beta_1 F + \beta_2 D + \beta_3 F \times D, \quad (A1)$$

where  $F$  and  $D$  are frequency of contact and duration of relationship, respectively. If we dummy-code the low and high values of  $F$  and  $D$ , respectively, as 0 and 1 in Equation A1, then four resulting values of  $RS$  are obtained.

Frequency of Contact	Duration of Relationship	$RS$
Low = 0	Low = 0	$RS_1 = \alpha$
Low = 0	High = 1	$RS_2 = \alpha + \beta_2$
High = 1	Low = 0	$RS_3 = \alpha + \beta_1$
High = 1	High = 1	$RS_4 = \alpha + \beta_1 + \beta_2 + \beta_3$

First, consider the situation with low relationship duration. The difference between the  $RS$  values for the low and high frequency values is  $RS_3 - RS_1 = \beta_1$ . For a high relationship duration, the difference between the  $RS$  values across the low and high frequency conditions is  $RS_4 - RS_2 = \beta_1 + \beta_3$ . Using Figure 2 as an illustration, duration moderates the association between frequency and relationship strength if  $RS_3 - RS_1 > 0$  and  $RS_4 - RS_2 = 0$ , that is, if  $\beta_1 > 0$  and  $\beta_1 + \beta_3 = 0$ .

By a similar line of reasoning, frequency moderates the association between duration and relationship strength if  $RS_2 - RS_1 > 0$  and  $RS_4 - RS_3 = 0$ , that is, if  $\beta_2 > 0$  and  $\beta_2 + \beta_3 = 0$ . However, if instead  $\beta_2 + \beta_3 > 0$ , then frequency *does not* moderate duration's effect on relationship strength. Taken together, to test the asymmetric pattern of moderation effects seen in Figure 2, we require the four conditions for the parameters of the regression model as given in Equation 2.

## Notes

1. As an extension we also consider the interrelationship of these constructs, positing satisfaction as influencing commitment and trust (Caceres and Paparoidamis 2007); trust as influencing commitment (Caceres and Paparoidamis 2007; Ulaga and Eggert 2006); and trust, commitment, and satisfaction as directly influencing customer-reported relationship strength (CRRS).

2. Strictly speaking, this is a definition of affective commitment, but we abbreviate to just *commitment* throughout.

3. We acknowledge that relationships can be formed with an individual (especially in the case of customized service) or a firm but use the generic term *service provider* throughout.

4. Note that the Service\_Category and Demographic variables are, in fact, vectors, comprising, respectively, two and eight variables.

5. Tests for interactions between frequency and commitment, between trust and satisfaction, and between duration and each of these variables resulted in no significant effects on relationship strength. This indicates that neither frequency nor duration moderates any of the links from commitment, trust, and satisfaction to relationship strength.

6. Bring (1994) showed that the  $t$  statistic in multiple regression is a robust measure of the relative importance of each independent variable.

7. We do not use a LISREL model to validate our full regression model because LISREL cannot be used for the later iso-contact analysis.

8. The test is based on a method developed by Aiken and West (1991), in which the regression slope coefficients are compared for differing levels of the two potential moderating variables. Aiken and West (1991, pp. 16-21) chose these levels to be one standard deviation below and above each moderator's mean value. Since the standard deviation exceeds the mean for both frequency and duration, we instead use low and high levels of frequency and duration based on median splits.

9. There is no frequency $\times$ duration interaction term in this model because it is implicit in the definition of iso-contacts.

10. Although our measure of contact frequency is likely interpreted by survey respondents as customer-initiated contact, it needs to be appreciated that firms too can initiate contact by, for example, direct mail or courtesy calls from personal bankers.

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**Tracey S. Dagger** is Senior Lecturer in Marketing at the University of Queensland. Her research interests include service quality and satisfaction, the economic and social outcomes of services, relationship development, co-creation in service contexts, and advertising research. She has won several international research awards and has previously published in the *Journal of Service Research* and *Journal of Services Marketing*.

**Peter J. Danaher** the Coles Myer Chair of Marketing and Retailing at the Melbourne Business School. He was previously at the University of Auckland and has had visiting positions at London Business School, The Wharton School, and MIT. He serves on the

Editorial Board for the *Journal of Marketing*, the *Journal of Marketing Research*, *Marketing Science* and the *Journal of Service Research*. He is also an Area Editor for the *International Journal of Research in Marketing*. His primary research interests are media exposure distributions, advertising effectiveness, television audience measurement and behavior, internet usage behavior, customer satisfaction measurement, forecasting and sample surveys.

**Brian J. Gibbs** (PhD, University of Chicago) is an associate professor (Marketing and Behavioral Science) at the Melbourne Business School.

His research, which focuses on the psychology of judgment and decision making, includes studies of taste self-manipulation, situational desire-proneness, consumption effort, intuitive hedonics, loss aversion in pricing, and the illusion of control. He has been a faculty member at Stanford and Vanderbilt Universities, as well as a visiting faculty member at MIT, and has taught graduate courses on consumer behavior, marketing management, marketing strategy, and behavioral decision making.