

7-2004

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Recommended Citation

Dellande, Stephanie, Mary C. Gilly, and John L. Graham. "Gaining compliance and losing weight: the role of the service provider in health care services." *Journal of Marketing* 68.3 (2004): 78-91.
DOI:10.1509/jmkg.68.3.78.34764

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This article was originally published in *Journal of Marketing*, volume 68, issue 3, in 2004. DOI: [10.1509/jmkg.68.3.78.34764](https://doi.org/10.1509/jmkg.68.3.78.34764)

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Gaining Compliance and Losing Weight: The Role of the Service Provider in Health Care Services

This research provides and empirically tests a conceptualization of health care services in which customer compliance outside of the service organization is necessary for successful health outcomes. Using data from service providers and customers in a weight-loss clinic, the authors examine the provider's role in gaining customer compliance. They find that provider expertise and attitudinal homophily play a role in bringing about customer role clarity, ability, and motivation. This study demonstrates that compliance leads to goal attainment, which results in satisfaction. More important, compliance also leads to satisfaction directly; consumers who comply with program requirements have greater satisfaction with the program.

The examination of compliance in health care services is important because many of today's major societal problems (e.g., high-fat diets, poor physical fitness, smoking) exist because of the poor health care choices that people make. Petty and Cacioppo (1996) indicate that most of the leading causes of death in the United States could be reduced substantially if people at risk would change just five behaviors: noncompliance with healthful behaviors, poor diet, lack of exercise, smoking, and alcohol and drug abuse. The many societal ills associated with noncompliance and the dearth of knowledge on customer compliance warrant this investigation.

It is important to understand the magnitude of the issue of health care compliance, particularly the social consequences of obesity and overweight. In 2002, people in the United States spent \$1.3 trillion (i.e., 12.7% of gross domestic product, or \$4,765 per capita) on health care-related products and services (Euromonitor International 2003). Obesity is among the most costly medical conditions. According to the National Institutes of Health, 60% of U.S. adults are overweight or obese. The relationship of obesity to other illnesses such as type 2 diabetes, hypertension, heart disease, stroke, and arthritis is significant; obesity now is the cause of more health problems than smoking, heavy drinking, or poverty (American Obesity Association 2002).

As a result of the problem of overweight and obesity, consumers are spending ever-increasing amounts on

weight-loss efforts. In the United States, 40% of women and 25% of men are trying to lose weight at any given time, and approximately 45 million people begin a diet each year. Consumers spend approximately \$30 billion per year trying either to lose weight or to prevent weight gain, approximately \$1 billion to \$2 billion of which is spent on medically supervised and commercial weight-loss programs (American Obesity Association 2002).

The solution to the problem of maladaptive consumer behavior does not lie in scientific breakthroughs in medicine, but in finding how to gain consumer compliance with directives of health care providers. As Jayanti and Burns (1998, p. 6) state, "The marketing challenge is considerable in that unhealthy habits and routines are firmly entrenched in consumers." Our purpose is to provide a conceptualization and empirical investigation of the service delivery process for health care services in which customer/patient compliance outside of the service organization is a necessary condition for a successful health outcome. Given that in many health care situations it is expected that patients continue to engage in certain behaviors for their long-term health after they leave the service organization (Bowen 1986; Bowman, Heilman, and Seetharaman 2002), it is crucial that health care providers understand the factors that influence patients' continuing to perform the prescribed behaviors.

Among social influences on health behavior, the health care provider is important (Jayanti and Burns 1998) and is more easily controlled by the health care organization. Bowman, Heilman, and Seetharaman (2002, p. 8) state that "the most powerful cue for compliance is the instruction" from the health care provider. In the weight-control context, behavioral counselors must provide their patients with support for their efforts as well as skills in lifestyle modification (Foreyt and Poston 1998). Given the importance of health care providers, our focus is on the provider's role in gaining compliance. When a service is complex, customized, and delivered over a series of transactions (e.g.,

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health care services), the relationship between the service provider and consumer is key (Crosby, Evans, and Cowles 1990). We seek to identify and relate providers' characteristics and consumers' attributes to both compliance and its outcomes.

Literature Review and Research Model

The success of most health care services depends on the consumer's compliance with instructions received from providers. Mills, Chase, and Margulies (1983) posit that the service production process entails a transaction that requires direct involvement of the customer; this involvement can affect a firm's productivity, its positioning relative to that of competitors, its service quality, and its customers' satisfaction (Bowen 1986). In health services, the patient provides the vital information about prior health behavior and the raw material input, such as knowledge and motivation, that is necessary for the transformation. This input is typically received through direct interface with the health care employee. Thus, productivity of health care services entails more than the performance of the service employee; patient performance must be assessed.

A Model of Compliance Antecedents and Outcomes

This research focuses on gaining compliance and particularly on the role of the health care professional in helping the customer attain the necessary attributes to comply. The model of customer compliance in Figure 1 highlights the ways provider characteristics are expected to affect customer attributes that are necessary for customer cooperation in the process of health care services.

Moorman and Matulich (1993) provide an excellent review of health models, drawing on literature from various behavioral fields. The overarching theory for our model is what they classify as a behavioral model: social cognitive theory (SCT). The SCT perspective perceives human behavior as a dynamic interaction between personal factors, behavior, and the environment (Bandura 1977). A person's thoughts, emotions, and so on are developed and modified by social influences in the environment, and these personal factors influence behavior. Thus, our model recognizes the potential of the health service provider to affect consumer attributes that provide direction for behavior (i.e., compliance).

Although several characteristics have been advanced as contributing to interpersonal influence, two that have received a great deal of attention are expertise and homophily (Crosby, Evans, and Cowles 1990; Gilly et al. 1998). Expertise is the mastery of a particular subject (in this case, weight loss), and homophily is the similarity between individual parties. Homophily is a provider characteristic in that it represents the extent to which the provider is similar to the customer; customers will respond to providers as homophilous only if they perceive providers as such (Parrott et al. 1998).

For the customer to take part in the delivery of health services, certain customer attributes are necessary. To the

extent that the health care provider possesses expertise and homophily with the customer, the provider will influence the customers' acquisition of the role clarity, ability, and motivation that are necessary for the customer to perform as expected. Role clarity involves understanding the role that must be performed, ability involves the skills needed to perform that role, and motivation is customers' incentive to carry out their role.

On leaving the supervision of the health care provider, customers' compliance with instructions is vital. The model posits key causal paths: (1) Compliance leads to goal attainment (i.e., realization of the targeted outcome); (2) should customers attain their goal, they are more likely to be satisfied with the service; and (3) compliance itself leads to satisfaction. Satisfaction is a favorable response to an outcome (in this case, the weight-loss program). A detailed discussion of the model elements follows.

Provider Characteristic: Expertise

Expertise entails having a special skill or knowledge that represents mastery of a particular subject (Stewart 1989). Simons, Berkowitz, and Moyer (1970) suggest that the greater the expertise of a communicator, the greater is the change toward the position advocated. Research in the sales literature (e.g., Busch and Wilson 1976) supports the idea that experts are more influential than nonexperts. In particular, in long-term buyer-seller relationships, the quality of the relationship is enhanced by seller competency (Crosby, Evans, and Cowles 1990). Thus, the communicator's expertise significantly affects audience reactions to persuasive communication.

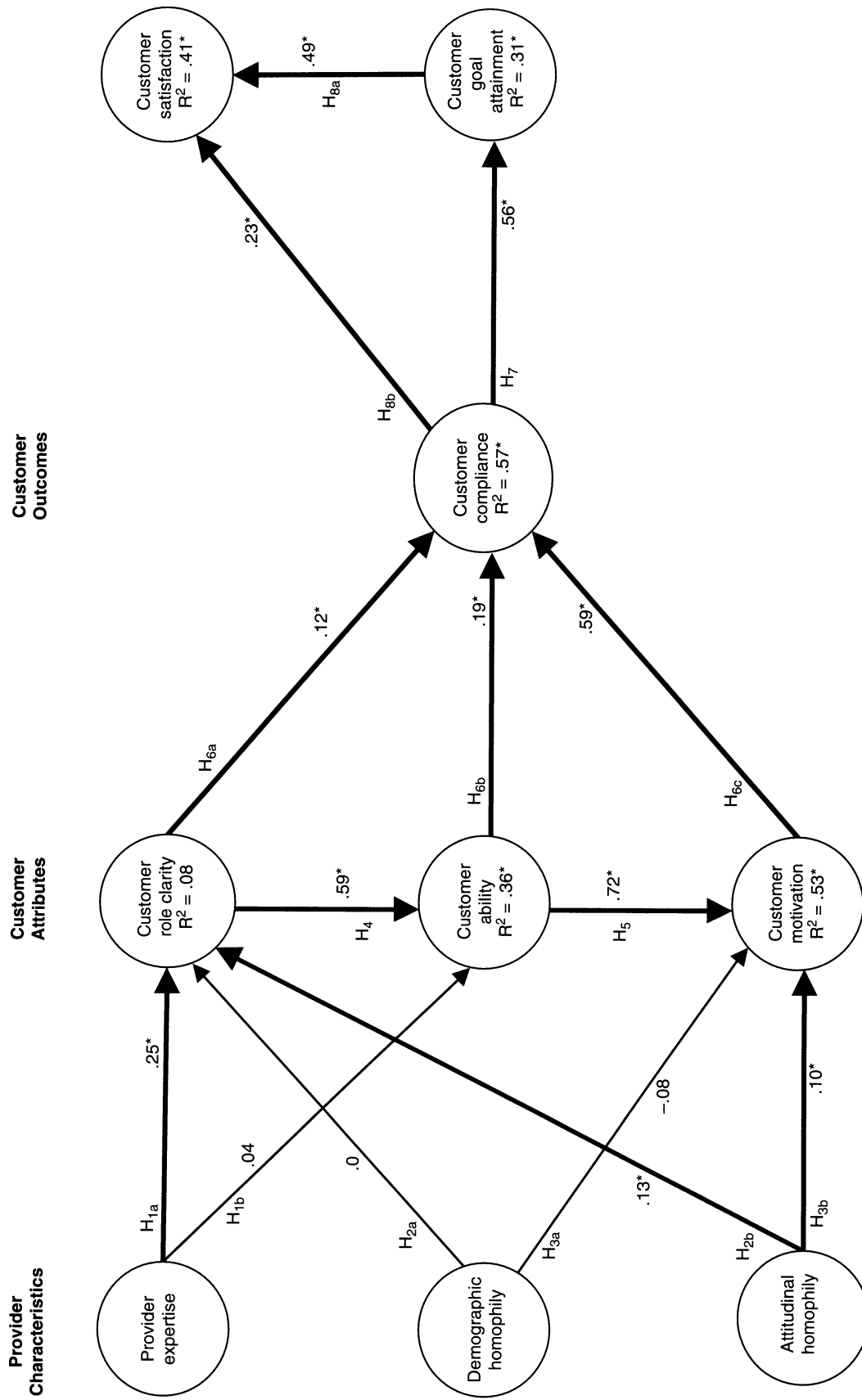
Expert providers can take a more active role in structuring the information environment and in clarifying the patient's role. Better-educated nurses tend to have better critical-thinking skills (Tanner 2003). Weight-clinic patients need orientation to address such questions as "Why should I use a pedometer?" The greater the provider's knowledge or expertise about such customer questions, the more likely the provider is to influence positively the customer's role clarity and abilities. Expert behavioral counselors can customize interventions with their patients to maximize their understanding of which changes must be made to lose weight successfully (Foreyt and Poston 1998). Customer education or training can take the form of formal orientation programs, written literature, and so on. Lovelock and Young (1979) and Winslow (1992) suggest that such efforts play a role in helping consumers know which behaviors to adopt and how to perform them. Although expert providers may also need such characteristics as communication skills and effort to affect customer attributes, the foregoing discussion supports the following hypothesis:

H₁: Increased service provider expertise results in customers having (a) greater role clarity and (b) greater ability to carry out their role.

Provider Characteristic: Homophily

Homophily refers to the degree to which people in a dyad are similar on certain attributes, such as demographic variables, attitudes, beliefs, and values (Touhey 1974). The lit-

FIGURE 1
Estimated Latent Variable Model



* $p < .05$.

Notes: Statistically significant relationships ($p < .05$) are indicated by bold lines between constructs.

erature suggests that homophily promotes attitude change and/or cooperation in two ways: by clarity of communication and by trust and liking. In the first case, the literature indicates that when a greater degree of homophily exists between communicators (e.g., between a medical expert and a patient), they are more likely to share common meanings for the messages they exchange (Rogers, Ratzan, and Payne 2001). Furthermore, when a target finds a source similar, the target is more likely to listen attentively to the source (Gotlieb and Sarel 1992). Simpson and colleagues (2000) suggest that when the receiver perceives him- or herself as similar to the source of the message, communication between the two is more effective in shaping or changing attitudes. That is, communication is more accurate and efficient.

In the second case, many researchers have noted that similarity leads to feelings of trust and respect (Simons, Berkowitz, and Moyer 1970) and to assumptions about common needs and goals (McGuire 1968). Crosby, Evans, and Cowles (1990, p. 71) add that in goal-interdependent contexts, "similarity (particularly attitude similarity) may be a cue for expecting the other party to facilitate one's goals." In a review of the literature on motivation for health behavior, Carter and Kulbok (2002) identify variables that explain motivation across several studies; a variable they identify is "social support and approval." In a weight-loss clinic setting in which the consumer is assigned to one service provider, the provider is key in offering social support and approval. Foreyt and Poston (1998) stress the importance of the health care provider's developing a collaborative relationship with the patient by using counseling and listening skills. Such a relationship is easier to establish between homophilous parties.

The theoretical support for the importance of demographic homophily has been consistent. For example, Fischer, Gainer, and Bristor (1997, p. 364) suggest that "in service settings where the customer expects to have extensive, repeated interactions" with the provider, customers may anticipate better service from demographically homophilous people because they are more comfortable interacting with them. In many health care services, customer and provider interactions are extensive and repeated. However, the empirical support for the salience of demographic homophily has been spotty (e.g., Brown and Reingen 1987; Fishman 1995). In general, demographic variables are easy to obtain, whereas assessment of customer attitudes requires more effort on the part of the health care organization. This study affords the opportunity to assess the importance of demographic and attitudinal homophily separately to determine whether demographic homophily is sufficient to influence customer attributes.

To the extent that communication between homophilous nurses and patients is clearer and more efficient, we expect that role clarity will be enhanced. The establishment of role clarity is mostly a matter of information and accurate communications, including receiver listening, and homophily can be expected to promote both of these. Relatedly, similarity between nurses and their patients can be expected to enhance the patients' motivation to comply. That is, homophily leads to relationships of liking and trust and

therefore motivates the patient to cooperate in the weight-loss program. Again, other provider characteristics, such as communication skills, may moderate the predicted relationships, but this discussion leads to the following hypotheses:

H₂: Service provider–customer dyads that are (a) demographically homophilous and/or (b) attitudinally homophilous result in customers having greater role clarity to carry out their role.

H₃: Service provider–customer dyads that are (a) demographically homophilous and/or (b) attitudinally homophilous result in customers having greater motivation to carry out their role.

Customer Attributes: Ability, Role Clarity, and Motivation

The services marketing literature has focused on customer participation in the service organization, citing the role of customers in service creation. For example, Bowen (1986) and Kelley, Donnelly, and Skinner (1990) suggest that service organizations view customers as quasi employees and manage their behavior in the service organization similarly to other employees. However, the services marketing literature has not invested much effort in customer participation outside of the service organization, which is a requirement of many health care services.

Bowen's (1986) model of the determinants of employee behavior in service performance supports the importance of the role clarity, ability, and motivation attributes in bringing about behavior change. He suggests that these determinants may also prove useful for understanding *consumer* behavior in service production and delivery. Bowers, Martin, and Luker (1990, p. 62) suggest a three-step process to enhance customer participation that mirrors Bowen's attributes but also provides guidance as to the order of the variables: "Step 1: Define the customer's job. Step 2: Train the customer to perform his or her job. Step 3: Retain the valuable customer by rewarding the customer for a job well done." Thus, we expect that role clarity leads to ability, which in turn leads to motivation. Patients who are not clear on what their role is in the process will be unable to acquire the needed skills to participate appropriately in the process. Furthermore, patients without the ability to perform needed behaviors will become frustrated and will lose motivation. Performance of the role will suffer if the role is not clear, even if patients are motivated and possess the ability to perform the role (Kearney 1978).

H₄: As customers gain role clarity, their ability to perform necessary behaviors increases.

H₅: As customers gain the ability to perform appropriate behaviors, their motivation to do so increases.

Compliance

For many health care services, service quality and customer satisfaction depend on the customer/patient complying with behaviors prescribed by the health care professional. However, compliance to prescribed medical regimens is notoriously low. Typically, adherence rates are only approximately 50% for prescribed medications, and compliance with instructions to lose weight or to stop smoking is much

lower. Long-term success rates on these lifestyle prescriptions are lower than 10% (Haynes, McDonald, and Garg 2002).

The literature on compliance is extensive, and research has been conducted in many fields, such as psychology, medicine, and consumer behavior. Often, researchers focus on consumers' compliance with a specific onetime request, considering different ways that the request can be made, including vocal intensity and touch (Remland and Jones 1994), postcompliance touch as an incentive for performing a task (Nannberg and Hansen 1994), impression management strategies (Jackson and Latane 1981; Rind 1992), and the foot-in-the-door technique (Rind and Benjamin 1994). The health literature is less concerned with onetime requests and more concerned with behavior change over a period of time. Fishman (1995) offers additional variables that are important to gaining compliance. He posits that there is mounting evidence that the patient's family, friends, and social support system offer significant contributions to compliance and subsequent improved health. Yet the variable that most consistently has been found to be associated with compliance is the patient-physician relationship.

Without the requisite role clarity, ability, and motivation, compliance is less likely. For example, Bostelman and colleagues (1994) find that between the time the patient is discharged from inpatient hospitalization and before the first appointment for outpatient treatment, many clients experience a personal or mental health crisis and need renewed connections with the health care system. What comes into question is whether the crisis is due to the patient's lack of clarity regarding his or her role, the patient's inability to perform prescribed roles, and/or a lack of motivation to perform when the patient is away from the service organization.

The health belief model (HBM) of compliance supports the predicted relationship between motivation and compliance (Becker 1976; Foxall, Barren, and Houfek 1998). The HBM was originally developed to explain preventive health actions (e.g., vaccinations), but it has subsequently been applied in studies of compliance with medical regimens. The HBM postulates that two key elements determine the likelihood of patients engaging in recommended health behaviors: the patient's (1) readiness to take an action and (2) evaluation of the feasibility and efficaciousness of the action (Aalto and Uutela 1997). Cues (motivation) to act trigger readiness to take an action. Cues can be internal (e.g., discomfort associated with excess weight) or external (e.g., advice from others, media campaign).

Moorman and Matulich (1993) find that ability and motivation affect consumers' health behaviors, though the influence depends on the health behavior being examined and the health ability characteristic being measured. Jayanti and Burns (1998) include health motivation, knowledge, and what they call "consciousness," a construct similar to role clarity, in their model of preventive health behaviors. In examining the influence of these three exogenous variables on preventive health behaviors, they find that only health motivation and consciousness are significant. Thus, we predict the following:

H₆: The greater the customer's (a) role clarity, (b) ability, and (c) motivation, the greater is the customer's compliance with service provider directives.

Outcomes: Goal Attainment and Satisfaction

When service customers take responsibility for their service outcomes, there is a greater likelihood that they will achieve their goals (Bagozzi and Dholakia 1999). As a result of complying or taking part in the service delivery process, customers become empowered. In so doing, the customer naturally becomes accountable for the performance of the activities involved in the service delivery process. Mills, Chase, and Margulies (1983) indicate that customers not only are involved in their own goal achievement but also must accept some responsibility for their satisfaction with the ensuing results.

As a result of complying with the role outside of the service organization, customers are expected to make progress on their goals, thus influencing their satisfaction with the service delivery process. Although individual customers may have medical conditions that interfere with weight loss, when the customer complies with the service provider's guidelines, he or she is more likely to attain the goal. The discrepancy between what is anticipated and what is received (i.e., disconfirmation) has been shown to predict satisfaction (Oliver 1996). As such, the closer the outcome is to the desired goal, the more likely it is that the customer will be satisfied.

Satisfaction is both a cognitive and an affective evaluation of the service experience (Mano and Oliver 1993; Westbrook 1987). We expect that the cognitive process of assessing goal attainment influences satisfaction directly. In addition, the affective evaluation of the health care experience associated with compliance may enhance satisfaction. Dubé, Bélanger, and Trudeau (1996) find that positive emotions are most important in patient satisfaction with medical care. Furthermore, Dubé (2003, p. 34) states, "Patient satisfaction is not only determined by cognitive expectations and perceptions of quality on a set of dimensions but also by the memories one has of the emotions experienced along the service process."

Kellogg, Youngdahl, and Bowen (1997) find that satisfaction is associated with several customer participation behaviors. Similarly, Kelley, Skinner, and Donnelly (1992) find that satisfaction results from customers contributing to their own service quality. Thus, we also expect that compliance influences satisfaction directly, because achievement of proximate behavioral goals may be satisfying even when the ultimate outcome goals are not attained. Consumers may experience pleasure in the consumption process that leads to satisfaction independent of disconfirmation (Wirtz and Bateson 1999). This is particularly likely in health services in which the consumer is actively involved in the service encounter (Price, Arnould, and Deibler 1995). For example, Johnson and colleagues (2002, p. 182) find that for some types of patients, "compliance with treatment ... [is] significantly associated with patient satisfaction."

H₇: The greater the customer's compliance with service provider directives, the greater is the customer's goal attainment.

H₈: The greater the customer's (a) goal attainment and (b) compliance, the greater is the customer's satisfaction.

Research Methods

Setting

The setting for this study was Lindora Comprehensive Weight Control, established in 1971 by Marshall B. Stamper as a comprehensive, medically based weight-control program with clinics throughout Southern California. As a comprehensive program, both the physiology and the psychology of the customer are addressed to promote permanent lifestyle change. As a medically supervised program, the customers are guided by clinic nurses, who are either registered nurses (RNs) or licensed vocational nurses (LVNs).

Visits to the Lindora clinic are an essential part of the program. The information and support provided exclusively by the customer's assigned nurse during each visit help the customer stay on task and motivated.¹ The program comprises three phases: weight loss, metabolic adjustment, and lifetime maintenance. This study focuses on the weight-loss process. During weight loss, customers' one-on-one visits provide counseling and medically based solutions to make dietary compliance more comfortable.

Data Collection

We collected data using three methods: Nurses and patients were asked to complete questionnaires, we obtained archival data, and a small group of nurses and patients were interviewed in depth.

Participants and questionnaires. Participants in the study included nurses and their assigned patients. We drew samples from several of the Lindora clinics throughout Southern California. A total of 376 patients (37.6% response rate) and 36 nurses (90% response rate) completed the questionnaires. Surveys were distributed to 40 nurses across 18 clinics. Nurses completed the survey independently and used a postage-paid envelope addressed to the researchers to return the survey. A cover sheet attached to the survey requested nurses' identification to match them to their respective patients. When matching was completed, the cover sheets were destroyed to maintain anonymity.

Each nurse was asked to distribute the patient survey to approximately 25 patients. Patients completed the survey without the supervision of the nurses and returned the survey using a postage-paid envelope addressed to the researchers. A cover sheet attached to the patients' surveys requested the patients' and their nurse's identification for matching purposes. When matching was completed, the cover sheets were destroyed to maintain anonymity.

Archival data. With patients' permission, Lindora also provided data from the records of 213 of the 376 patients in the study. The data included the percentage of required vis-

its made by patients to the clinic and the amount of weight lost by each patient. Such data offer an objective view of customer compliance behavior (albeit narrowly defined) and goal attainment, respectively.

Interviews. On removal of the survey cover sheet, the names of patients and their nurses were noted as potential participants for in-depth telephone interviews. Eight patient participants and nine nurse participants took part in the interviews. In qualitative research, in general, data collection continues until no new insight is provided; McCracken (1988) suggests that usually eight participants are sufficient. The first author conducted structured telephone interviews that lasted approximately 30 minutes each. In general, participants declined to be recorded; thus, the first author took extensive notes.

To better understand the quantitative results, interview questions of nurse and patient participants included, "What nurse characteristics or qualifications are needed to gain customer compliance with the weight-loss program?" "How did you get matched up with your nurse (patient)?" and "In what ways are you similar/dissimilar?" Additional questions were asked about the role the nurse played in clarifying the customer's role and in motivating and enabling the customer to adhere to his or her role. Participants were also asked whether the program works.

Measures

We measured provider expertise in three ways. First, we measured customers' perceptions of providers' expertise using a five-item scale adapted from Bruner and Hensel (1994) ($\alpha = .99$). Second, nurses were asked to report their credential: "none, RN, or LVN." Third, nurses also reported their years "of experience in the field of nutrition and weight loss." We summed the five-item scale and properly modeled the indicators of the three potentially unrelated aspects of expertise as formative indicators of provider expertise.

We measured demographic homophily using the four characteristics used previously by Brown and Reingen (1987). We gathered data on the sex, education, ethnicity, and age of patients. We also asked patients for their perceptions of their provider on the same items. We then calculated the similarity in the ratings across patient and nurse on each of the four demographic items using formulas such as age homophily = (-1) (absolute value of customer age - provider age), and gender homophily = same sex (1), different sex (0). Because we did not necessarily expect the four types of homophily to be correlated, we combined the four scores as formative indicators in the partial least squares (PLS) analysis (Diamantopoulos and Winklhofer 2001; Jarvis et al. 2003).

We measured and modeled attitudinal homophily in an analogous manner, comparing patients' attitudes and patients' perceptions of nurses' attitudes across four separate seven-point items (see the Appendix). Questions about patients' attitudes appeared at the beginning of the questionnaire, and questions about patients' perceptions of nurses' attitudes appeared near the end of the questionnaire.

We measured the customer attributes of role clarity, ability, and motivation using the patients' questionnaires.

¹Support group meetings in which customers, led by a program counselor, share their dieting experiences are not an aspect of Lindora's program; thus, a single provider is the primary contact for the customer.

For each of the three constructs, we developed six-item scales based on the six separate components of Lindora's weight-loss program (see the Appendix). Thus, we modeled each of the three constructs using a formative indicator approach, because we did not expect the six individual items to be correlated.

The face validity of the role clarity, ability, and motivation measures was assessed through the ratings of expert judges. Seven marketing-faculty judges independently assessed how well each of the items reflected the different dimensions of the customer attribute constructs (role clarity, ability, and motivation). Judges used the following rating scale: 1 = "clearly representative," 2 = "somewhat representative," and 3 = "not at all representative" (Bearden, Hardesty, and Rose 2001). Because no item was rated a 3, we retained all 18 items.

We operationalized compliance in two ways. First, we used a nine-item scale on the patients' questionnaires to measure compliance. Examples of the scale items include whether patients visited the clinic as instructed, followed the nurse's weight-loss directives, and kept a daily journal of their weight-loss program activities. We devised scale items on the basis of discussions with Lindora's director of research about tasks expected of program participants. The alpha coefficient for the compliance scale is .80, and we summed the nine items for use in the analysis. Second, we supplemented self-report measures with a behavioral measure of compliance that was comparable to one of the scale items. We obtained the percentage of required visits made to the clinic from Lindora.² Because this archival measure focused narrowly on one aspect of compliance, we modeled the two compliance measures as a formative indicators for the PLS analysis.

We also measured goal attainment, a customer outcome variable, in two ways. First, we summed a four-item scale to measure goal attainment by asking patients whether they (1) are attaining, (2) think they will achieve, (3) are making progress toward, and (4) are not attaining their weight-loss goal ($\alpha = .86$). Second, we measured goal attainment using company data on the actual percentage of each patient's weight loss.³ Because the customer self-report and archival data are different measures of the same construct, the two are properly combined as reflective indicators for the analysis.

Finally, we measured the outcome variable, satisfaction, by asking patients about whether they were satisfied with the service (Lindora Comprehensive Weight Control) and the service provider (weight-loss nurse) and about their intention to enroll in the maintenance program on completion of the weight-loss program. The scale used in the study consisted of nine items ($\alpha = .79$) (Bruner and Hensel 1994),

²The behavioral measure (percentage of visits that the patient made to clinic) and self-report measure (the scale item: patient visited clinic as instructed) of compliance are weakly correlated, where $r = .154$ ($p < .05$).

³The behavioral measure (percentage of weight loss by patient) and self-report measure (the scale item: patient is attaining weight-loss goal) of goal attainment are correlated, where $r = .349$ ($p < .05$).

which we summed for the analysis. Elimination of the item that measured intention to enroll in the maintenance program on completion of the weight-loss program improved the scale reliability ($\alpha = .85$).

Pretest

Before collecting data for the study, we conducted a pretest to ensure the integrity of the data collection instrument and the mode of administration. We conducted pretesting at a Lindora clinic that did not participate in the actual study. The pretest sample consisted of three nurses and eight of each of their patients. The pattern of answers from the pretest was sensible. That is, the meaning of the questions intended by the investigators was the meaning that the respondents attributed to the questions (Hunt, Sparkman, and Wilcox 1982). In addition, the mode of administration was successful; we received all questionnaires within three days of distribution.

Data Analysis

The statistical method we used to determine whether relationships exist between the model variables was PLS structural equation modeling, which entails a mathematically rigorous computation to determine the optimal linear relationships between latent (theoretical) variables. The PLS method is perhaps the best analytical method for this study given the nature of the data and the measures. The data consist of both formative and reflective indicators of the constructs. The PLS method handles both types of indicators, whereas other path analytical methods (e.g., LISREL, EQS) can handle only reflective indicators (Falk and Miller 1992).

We also performed qualitative analysis of the depth interview data, guided by the systematic approach to qualitative research in the work of Glaser and Strauss (1967) and Strauss and Corbin (1998). The theoretical model proposed for this study provided a framework for structuring the depth interviews. We analyzed depth interview data by comparing and explaining the findings relative to the survey or quantitative results. Triangulation of the different sources of data increases our confidence in the validity of our findings.

Findings

The findings are summarized in Figure 1. The questionnaire data collected from patient and nurse respondents suggest that the groups are demographically similar. Typically, the nurse was female, a college graduate, Caucasian, and a baby boomer (born between 1946 and 1964). In most cases, the patient was female, had some college education, and was Caucasian and a baby boomer. Nurses were almost evenly split between RNs and LVNs. The range of experience was 1 to 15 years, with a mean of 5.38 years. For a summary of the 34 manifest (i.e., directly measured) variables used in the model, see Table 1.

Expertise

We found the path coefficient or direct effect of provider expertise on customer role clarity (.25, $p < .05$) to be as pre-

dicted in H_{1a} . Examination of the latent variable weights in Table 1 shows perceived expertise (the five-item scale) to be the most important among the three latent variables that define the construct provider expertise. The depth interviews of both the patients and the nurses revealed that in addition to expertise, experience was an important influence on role clarity as well. A patient reported:

The nurses know the program “inside-out”; they can point to specifics in the book when offering help. They can also provide alternative suggestions when a patient doesn’t like a certain food.

The comments of nurses were consistent with this view:

Nurses must have knowledge in the field of nutrition or in the medical field.

Nurses must have experience dealing with different types of patients; different types of patients will require different treatment.

H_{1b} , which predicted that provider expertise influences customer ability (.04), was not supported.

Homophily

The direct effects of demographic homophily on customer role clarity (.0) and customer motivation (−.08) were not statistically significant. The direct effects of attitudinal homophily on customer role clarity (.13) and customer motivation (.10) were weak but statistically significant ($p < .05$) (H_2 and H_3). To learn more about the role of similarity in gaining customer compliance, depth interview questions investigated whether patients and nurses perceived similarity as an important variable in customer compliance. Findings indicate that some patients perceived that they were similar to their nurses and that such similarity was important to compliance:

The nurses have been through the program at my clinic; they know what relapse is like. They are not a bunch of size two people.

If my nurse never had a weight problem, how could she really understand my struggle?

However, nurses did not necessarily believe that being similar to their patients was important in gaining compliance:

I don’t have any patients that are like me, and I get their compliance because of years of practice. You need to know personality types and mirror that to make them more comfortable and thus compliant.

It is not necessarily easier to gain compliance with patients who are similar; it really depends on the patients’ motivation; this will determine the patients’ results. Being similar may actually hurt the outcome because patients may expect their nurse to go easy on them.

Ability, Role Clarity, and Motivation

H_4 and H_5 were supported. Role clarity influences the acquisition of ability (.59, $p < .05$), and ability leads to motivation (.72, $p < .05$). In addition, the direct effects of role clarity, ability, and motivation on compliance (.12, .19, .59, respectively) are statistically significant ($p < .05$); thus, H_6 is supported. The extreme importance of motivation in gain-

ing compliance was also noted in the interviews with nurses:

Self-motivation is the number-one attribute the patient must have in order to comply with the program. People with the desire to change are the most successful people. Those that show up at Lindora and expect us to fix them are less successful.

They must be committed and ready to do the program, willing to set goals, willing to follow instructions, motivated/determined to lose weight, interested, and enthusiastic.

Compliance

The direct effect of compliance on goal attainment is strong (.56) and statistically significant ($p < .05$), in support of H_7 . Patient informants strongly believed that Lindora’s weight-loss program worked and that if the patient complied with the guidelines of the program, the patient was likely to attain his or her goal:

The program works. I have to decide to do it. There is only so much Lindora can do; the ball is in my court.

While the knowledge and support they gave me were important, ultimately, I did what I was supposed to do.

Nurse informants agreed:

If patients follow the program, they’ll lose weight.

Oh yes, the program works. When they [patients] use the tools, weight loss is greater; when they [patients] don’t use the tools, weight loss is slower or ceases.

Goal Attainment

H_{8a} is supported, and the direct effect of goal attainment on satisfaction (.49) is statistically significant ($p < .05$). Both patient and nurse participants in the interviews suggested that if the patient achieved his or her goal, the patient was likely to be satisfied with the weight-loss program. As a patient stated, “Yes, I’m absolutely satisfied with the program because I reached my goal.” In a similar manner, a nurse stated, “Patient goal attainment ensures satisfaction with the program.” Customer compliance also had a direct (unmediated) effect on satisfaction, as H_{8b} predicted (.23, $p < .05$).

The root mean square covariance between the residuals of the manifest and latent variables (RMS Cov [E, U]) of .04 indicates that the model fits the data quite well. This index reports the amount of correlation between the variables that is not accounted for by the model specifications. A coefficient greater than .20 is evidence of an inadequate model, and a coefficient of .02 indicates a superior model (Falk and Miller 1992).

Discussion and Implications

Although cross-sectional data limit the strength of inferences about causal connections, our findings suggest that the primary causal chain that runs through the model is the following: provider expertise → customer role clarity →

TABLE 1
PLS Loadings, Descriptive Statistics, and Correlation Matrix

Components and Manifest Variables	PLS LV Weights	Means	S.D.	3	4	5	6	7	8	9	Correlation Matrix							
											10	11	12	13	14	15	16	17
Expertise																		
Expert	.99	30.35	6.56	1														
Credential	.24	.60	.49	-.077	1													
Years	.08	5.38	3.26	.023	-.115	1												
Demographic Homophily																		
Sex	.40	.12	.32	.090	-.049	.009	1											
Education	.85	1.18	1.00	.006	.028	-.018	.047	1										
Race	-.22	.35	.48	-.035	-.109	.060	-.018	-.033	1									
Age	-.21	1.29	1.00	-.042	.115	-.161	.016	.046	-.011	1								
Attitudinal Homophily																		
Pills	.27	1.20	1.25	.023	-.049	-.056	-.031	-.041	-.007	.055	1							
Surgery	-.29	1.31	1.21	.061	-.029	-.035	-.116	.025	-.025	-.027	.270	1						
Dieting	-.68	1.02	1.29	.004	.004	-.076	-.033	.079	.019	.042	.123	.120	1					
Diet + exercise	.76	.54	.84	-.013	-.021	.001	-.013	.088	-.007	.007	-.045	.089	.091	1				
Role Clarity																		
Activity	.55	5.99	.99	.222	-.005	-.017	-.021	-.054	.029	-.010	.061	.060	.127	-.042	1			
Carbohydrates	.28	6.31	.78	.156	.015	.021	-.059	.013	.043	-.080	-.006	.010	.090	-.045	.368	1		
Dairy	.08	6.05	1.55	.015	.031	.103	-.113	.075	-.051	.030	-.013	-.001	.072	-.052	.102	.180	1	
Environment	.38	5.71	1.34	.134	.071	-.011	.093	.052	-.029	.021	-.076	-.023	-.012	-.095	.217	.286	.070	1
No supplements	.10	5.87	1.54	.118	.026	-.075	-.018	.043	-.070	-.075	-.008	.023	-.015	-.015	.138	.158	.242	.047
Yes supplements	.12	6.03	1.06	.170	.025	-.077	-.023	-.045	-.021	-.017	.035	.002	-.031	-.049	.447	.339	.163	.236
Ability																		
Activity	.19	5.88	1.13	.066	.050	.046	-.102	-.012	.019	-.010	.099	.039	-.039	.034	.342	.126	.039	.070
Carbohydrates	.24	6.11	.92	.111	.045	.049	-.016	.018	.024	-.062	-.003	.020	.059	-.040	.246	.565	.089	.164
Dairy	.36	5.69	1.56	.082	.045	.047	.008	-.024	-.006	-.079	.022	.009	-.022	.019	.220	.218	.097	.084
Environment	.48	5.93	1.00	.139	-.030	.004	.069	-.004	-.006	-.063	-.065	-.029	.035	.010	.242	.414	-.013	.484
No supplements	.14	6.21	1.10	.108	.067	.068	-.109	.043	-.020	-.066	-.089	-.003	-.046	-.050	.063	.154	.249	.011
Yes supplements	.18	6.12	1.08	.192	.021	.072	.036	-.021	.100	-.080	-.014	-.088	-.022	-.088	.147	.204	.046	.059
Motivation																		
Activity	.35	5.82	1.13	.067	.093	.096	-.056	-.036	-.016	.065	-.008	.032	-.063	-.109	.280	.159	.018	.163
Carbohydrates	.26	5.91	1.15	.034	.121	.027	-.088	-.150	.013	.023	.013	.028	.145	-.039	.246	.404	.051	.153
Dairy	.35	4.91	1.88	.036	-.014	.046	.000	.005	.053	.025	.075	.046	.028	-.011	.192	.141	.142	.167
Environment	.33	5.88	1.00	.178	.023	.008	.044	-.054	.011	-.036	-.063	-.032	.077	-.047	.238	.446	.036	.414
No supplements	.12	5.50	1.75	.093	.004	-.023	.021	.019	.009	-.044	-.072	.040	-.021	-.001	.126	.059	.223	.125
Yes supplements	.22	5.35	1.48	.076	.014	.011	-.041	-.009	-.005	-.038	-.110	-.005	.011	-.067	.120	.116	.128	.162
Compliance																		
Subjective	1.00	51.08	7.47	.173	.060	.130	.015	-.081	.055	.043	-.045	.027	.036	-.007	.411	.343	.137	.324
Percentage visits	.01	.82	.21	-.041	.191	-.033	-.076	.091	.009	.100	-.035	-.009	.070	.089	.003	.040	.000	.119
Goal Attainment																		
Subjective	.95 ^a	23.41	3.44	.066	.040	.096	.048	-.129	.073	-.059	-.037	-.019	.026	-.015	.220	.393	.099	.266
Percentage weight loss	.63 ^a	.10	.05	-.008	.004	.032	-.061	.033	.133	-.123	-.030	.000	.146	.091	.096	.247	.017	.131
Satisfaction																		
Satisfied	1.00	51.57	4.39	.187	-.021	.085	.115	-.084	-.014	-.011	-.008	.036	.070	-.079	.296	.436	.073	.399

TABLE 1
Continued

Components and Manifest Variables	PLS LV Weights	Means	S.D.	Correlation Matrix																						
				18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36				
Expertise																										
Expert	.99	30.35	6.56																							
Credentialed	.24	.60	.49																							
Years	.08	5.38	3.26																							
Demographic Homophily																										
Sex	.40	.12	.32																							
Education	.85	1.18	1.00																							
Race	-.22	.35	.48																							
Age	-.21	1.29	1.00																							
Attitudinal Homophily																										
Pills	.27	1.20	1.25																							
Surgery	-.29	1.31	1.21																							
Dieting	-.68	1.02	1.29																							
Diet + exercise	.76	.54	.84																							
Role Clarity																										
Activity	.55	5.99	.99																							
Carbohydrates	.28	6.31	.78																							
Diary	.08	6.05	1.55																							
Environment	.38	5.71	1.34																							
No supplements	.10	5.87	1.54																							
Yes supplements	.12	6.03	1.06				.251																			
Ability																										
Activity	.19	5.88	1.13			.178																				
Carbohydrates	.24	6.11	.92			.173	.282																			
Diary	.36	5.69	1.56			.183	.122	.279																		
Environment	.48	5.93	1.00			.073	.243	.154	.333																	
No supplements	.14	6.21	1.10			.184	.102	.103	.260	.128																
Yes supplements	.18	6.12	1.08			.171	.381	.286	.344	.172	.202	.249														
Motivation																										
Activity	.35	5.82	1.13			.036	.112	.329	.214	.220	.248	.096	.132													
Carbohydrates	.26	5.91	1.15			-.023	.121	.178	.503	.337	.294	.064	.204	.352												
Diary	.35	4.91	1.88			.020	.063	.167	.260	.502	.205	.196	.085	.180	.358											
Environment	.33	5.88	1.00			.090	.240	.146	.407	.265	.739	.180	.257	.332	.416	.280										
No supplements	.12	5.50	1.75			.197	.287	.040	.049	.146	.089	.201	.176	.095	.065	.191	.110									
Yes supplements	.22	5.35	1.48			.085	.340	-.025	.044	-.025	.137	.040	.226	.110	.063	.056	.126	.616								
Compliance																										
Subjective	1.00	51.08	7.47			.134	.304	.293	.404	.449	.492	.233	.289	.505	.494	.498	.536	.329	.313							
Percentage visits	.01	.82	.21			-.056	.002	-.035	.028	-.060	.088	-.112	-.003	-.006	-.007	-.044	.022	.079	.074	.088						
Goal Attainment																										
Subjective	.95a	23.41	3.44			.119	.239	.174	.376	.451	.560	.221	.236	.366	.428	.304	.504	.192	.089	.559	.067					
Percentage weight loss	.63a	.10	.05			.162	.012	.101	.255	.151	.191	-.027	-.005	.133	.248	.164	.165	.111	.036	.267	.427	.349				
Satisfaction																										
Satisfied	1.00	51.57	4.39			.085	.332	.133	.359	.271	.590	.189	.241	.297	.404	.215	.557	.153	.160	.499	.041	.651	.224			

^aLatent variable (LV) loading coefficients for reflective indicators. Communality coefficient = .36.
Notes: S.D. = standard deviation.

customer ability → customer motivation → customer compliance → goal attainment → customer satisfaction. These findings have important implications for both researchers and practitioners, and we subsequently discuss these in detail.

Provider Characteristics

The findings empirically confirm Swartz's (1982) proposition that expertise is a key characteristic of influencing agents. Expert providers are more likely to influence customer role clarity. The expertise measure that is most important in influencing the customer is the customer's perception of the provider's expertise. Thus, if customers believe that the provider is an expert, they will tend to heed the provider's instructions, which provides empirical evidence for Simons, Berkowitz, and Moyer's (1970) proposition that the greater the expertise, the greater is the change toward the position advocated by the communicator. Organizations should consider ways to communicate staff expertise to their customers, such as including credentials in brochures and posting diplomas and certificates.

We investigated both demographic and attitudinal homophily in this study. Although the relationships of attitudinal homophily to customer attributes are statistically significant, they are weak. The hypotheses about demographic homophily were not supported. Whereas Brown and Reingen (1987) find that demographic homophily predicts consumer-to-consumer influence, the findings in this study are consistent with those of Fishman (1995), who indicates that demography does not appear to be a strong predictor of influence. These results may be partly explained by providers' and customers' demographic similarity (e.g., age, sex, race) in ways that are less meaningful or important to influence. An additional problem may be that there was limited variation on the demographic characteristics of consumers and providers in the sample. More research on this construct is needed in the context of influence processes. Provider expertise and homophily may be required but not sufficient to bring about customer role clarity, ability, and motivation. Further research should examine moderating variables such as communication skills and motivation.

Customer Attributes and Compliance

Compliance is the central construct in this research. Bowen (1986) suggests that customer participation in the service process is facilitated when customers have the ability and are clear about their role and motivated to perform as expected. We extend Bowen's work by empirically determining that these variables are antecedents of compliance with prescribed regimens when customers are expected to continue to perform beyond the face-to-face exchange (i.e., without the direct input of service providers). In addition to determining that these variables are antecedents of compliance, we also determined the nature of the relationships among the variables (i.e., that role clarity leads to ability, which in turn leads to motivation).

The qualitative data were valuable for further exploration of motivation in relation to gaining compliance. For example, a patient stated, "Motivation is number one; skills

are important but if you are not motivated, you won't do it." Nurse participants also indicated that customer motivation is the key and that it must come from within the patient. For example, a nurse stated, "If the patient is not self-motivated, I can't give him or her motivation; the learning process, however, may lead to motivation." Our results strongly support this observation; role clarity and ability lead to motivation.

Theories of motivation (e.g., self-efficacy, goal setting, attribution, expectancy value, social cognition) largely focus on *beliefs* about competency and expectancy for success, *values* as to why people engage in different activities, and how *goals* influence self-efficacy and performance. The Latin root of the word "motivation" means "to move"; thus, the study of motivation is the study of action (Eccles and Wigfield 2002). However, these theories do not indicate the attributes that are necessary for a person to move or to act. Kuhl (1987) indicates that many motivational theorists assume that motivation leads directly to outcomes. He posits instead that motivational processes lead only to the decision to act. Our study builds on these theories by identifying specific customer attributes (role clarity, ability, and motivation) that promote or lead to acting or complying.

Goal Attainment and Satisfaction

In this study, we determined that compliance leads to goal attainment. Although this finding is intuitive and not surprising, it is an important result. Mills, Chase, and Margulies (1983) suggest that as a result of taking part in the service delivery process, the customer becomes accountable for the performance of the activities involved in the process, including goal achievement. Because compliance decreases as the duration of the regimen increases, providers can reassure or impress on consumers during periodic meetings that if they stick with the program, they will realize their goal.

The finding that goal attainment leads to satisfaction is somewhat less intuitive in the context of health services. Customers' having to give up an enjoyable habit (e.g., eating junk food) could easily have an adverse impact on satisfaction. The unhealthy habit likely yields immediate gratification, whereas the healthful behavior does not bear fruit until sometime in the future. Consequently, it is easy to realize how consumers might not have a sense of satisfaction from having attained their goal given the sacrifice to realize it. Oliver (1996) indicates that disconfirmation, the discrepancy between what is anticipated and what is received, is a predictor of satisfaction. In support of Oliver's theory, the relationship between goal attainment and satisfaction was strong, which indicates that when goals are attained, customers are satisfied.

Although we found compliance to lead to goal attainment, compliance was also directly related to satisfaction. The act of complying with the service provider's instructions perhaps strengthens the relationship between patient and provider, thus creating a more satisfying relationship. Foreyt and Poston (1998) recommend that behavioral counselors in obesity treatment programs develop a collaborative relationship with the patient by using counseling and listening skills, thus improving the patient-provider alliance. Further research is needed to determine whether the interac-

tion with the service provider contributes to satisfaction or whether the compliance behavior itself is satisfying to customers. Both are likely to contribute, because the relationship between provider and customer is focused on the required behaviors.

Contribution

Extant literature in the fields of consumer behavior, psychology, and medicine is replete with compliance-gaining research that focuses on source actions (e.g., foot-in-the-door, door-in-the-face, vocal intensity, touch) that are useful in gaining compliance with onetime requests and when the provider and customer are in a face-to-face encounter (Del-lande and Gilly 1998). Although source actions have been examined in these onetime compliance requests, we contribute to the literature by considering source characteristics that are useful in gaining compliance in services that are long-term in nature and when the customer is not in the presence of the provider. Furthermore, the framework of this study contributes to the literature in that it more completely examines compliance behavior by including the role of the provider, the role of the customer, the compliance process, and postcompliance outcomes.

The findings of the study reveal important drivers of customer satisfaction in the studied health care services setting. Provider expertise leads to customer role clarity, ability, motivation, compliance, goal attainment, and satisfaction. Of particular salience is the testing and sorting out of the relationships among the three customer attributes described by Bowen (1986). Moreover, managers may find it useful to monitor the three customer attributes to determine customer “readiness” (Ostrom 2003) and to make customer selection decisions accordingly (at least in non-life-threatening situations). The hypothesized model provides an excellent “nomological net” in which to demonstrate the theoretical usefulness of the concept of compliance. In addition, as we expected, compliance appears to be a key link in the causal chain investigated. Although all important factors in the causal chain are worthwhile for managers to monitor, the results of this study suggest that compliance deserves special attention. That is, role taking and consumer diaries may be important tools in maximizing consumer goal attainment and satisfaction. Indeed, rewards might be structured for both provider personnel and customers on the basis of such compliance measures.

Conclusion

Although customer noncompliance in health care-related services can have life-and-death ramifications, it is also important to consider services that are not related to health care. Lack of compliance in such services that depend on customer compliance (e.g., long-term financial planning, education, tax preparation, preventive auto maintenance) can also lead to adverse outcomes for consumers, organizations, and society. For example, people who use tax-preparation services but do not keep accurate records or receipts often do not qualify for certain tax benefits. In addition, failure to comply in this area may have other

adverse outcomes such as owing unnecessary taxes and/or paying penalties. Thus, our research has implications beyond health care services.

Appendix New Scales: Attitudinal Homophily and Customer Attributes

Attitudinal Homophily (1 = “Disagree Strongly,” 7 = “Agree Strongly”)

- It is okay to use diet pills to attain ideal weight.
- It is okay to have plastic surgery (e.g., liposuction) to attain ideal weight.
- Dieting alone is sufficient to manage weight.
- It is necessary to include exercising along with dieting to manage weight.

Role Clarity (1 = “Disagree Strongly,” 7 = “Agree Strongly”)

- My weight-loss program has not made it clear how to keep a diary of my daily food/beverage intake. (reverse coded)
- My weight-loss program has made it clear how to determine my daily intake of carbohydrates.
- My weight-loss program has made it clear the number of prepackaged food supplements to take each day.
- My weight-loss program has made it clear how to determine my daily level of physical activity.
- My weight-loss program has not made it clear how to take the prepackaged food supplements. (reverse coded)
- My weight-loss program has made it clear how to control my environment.

Ability (1 = “Disagree Strongly,” 7 = “Agree Strongly”)

- I am not able to determine how to take the prepackaged food supplements. (reverse coded)
- I am able to determine the number of prepackaged food supplements to take.
- I am able to determine my daily level of physical activity.
- I am able to determine my daily intake of carbohydrates.
- I am able to apply the skills my nurse has taught me to help control my environment.
- I am not able to keep a diary of my daily food/beverage intake. (reverse coded)

Motivation (1 = “Disagree Strongly,” 7 = “Agree Strongly”)

- I feel motivated to take the prepackaged food supplements prescribed by the program.
- I feel motivated to determine my daily level of physical activity.
- I feel motivated to calculate my daily intake of carbohydrates.
- I do not feel motivated to take the prepackaged food supplements that are suggested. (reverse coded)
- I do not feel motivated to keep a diary of my daily food/beverage intake. (reverse coded)
- I feel motivated to apply the skills my nurse has taught me to help control my environment.

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