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# Listening to patients' voices: Linguistic indicators related to diabetes self-management

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## Abstract

*A great deal of research in health care has examined a wide range of variables to better understand the degree to which patients follow the advice of medical professionals in managing their health, known as adherence. This paper explains the development of the linguistic systems to describe and evaluate two psychosocial constructs (i.e. control orientation and agency) that have been found to be related to adherence in previous research for subjects with diabetes (Trento et al. 2007; Wangberg 2007; O'Hea et al. 2009). The present data came from 43 semi-structured in-depth interviews of subjects with Type 2 diabetes. One-on-one interviews with open-ended questions elicited subjects' 'stories' about living with diabetes, and the transcribed interviews were analyzed to develop the linguistic systems of control orientation and agency. The resultant systems were applied to the 43 interviews by raters with high inter-rater reliability. The results showed demarcations of clearly identified codings of patient types. The paper presents the linguistic coding systems developed in the study, the results of their application to the patient interview data, and recommendations for improved communication with patients.*

*Keywords: adherence; agency; control orientation; diabetes; linguistic indicators; patient-centered*

## 1. Introduction

A great deal of health care research has focused on the degree to which patients accurately follow the advice of medical professionals in managing their health. This research has assumed a variety of labels, including *compliance* (e.g. Frankel and Beckman 1989; Morris and Schulz 1992, 1993; Klingle and Burgoon 1995; Moisan *et al.* 2002; Bower and Taylor 2003), *adherence* (e.g. Dunbar 1998; Dunbar-Jacob and Schlenk 2001; Murray *et al.* 2004), *disease management* and *self–care* (e.g. Kickbusch 2004). The term *adherence* is used for the study presented in this paper.

Over the past four decades, researchers have examined a wide range of variables in an effort to better understand adherence. Much of this research has focused on variables related to the patient (or potential 'adherer'), such as psychological characteristics (Wallston 1992; Maibach and Murphy 1995; O'Hea 2003; Hagedoorn *et al.* 2005), health and medication beliefs (McHorney 2009), or demographic characteristics (Pryor and Mengel 1987).

In spite of the extensive research, factors associated with predicting and increasing treatment adherence remain elusive. In their review of compliance research, Morris and Schulz (1992: 283) conclude: 'After decades of compliance research, very little consistent information is available, except that people do not take their medications as prescribed'. Similarly, after reviewing research exploring the relationship between adherence and psychological characteristics, cognitive-motivational factors, behaviors, and semantic factors, Dunbar (1998: 358) concluded that 'the predictive power tends to be modest at best for any single factor'.

Linguistic research has begun to give voice to patients in an effort to better understand adherence. Hamilton (2001), for example, examined verbal accounts offered by 18 patients immediately following their doctor visits. She analyzed the discourse structure and personal attribute statements within these personal accounts and identified reasons for noncompliant actions related to the diabetes management plans recommended by the physicians. The analysis of patients' own talk illuminated the patients'

'life world' circumstances, which may be a key to better understanding patient adherence. Recently, researchers have been encouraged to examine the patient's perspective (Morris and Schulz 1992; van Dulmen *et al.* 2008) through their language.

The present study expanded this line of linguistic research on patients' own accounts of living with and managing diabetes. Diabetes is a chronic illness affecting the lives of more than 25.8 million (8.3%) Americans (Centers for Disease Control and Prevention 2011) and more than 346 million people worldwide (World Health Organization Fact Sheet 2011). Diabetes can be managed by engaging in a range of healthy behaviors, such as exercising, eating a well-balanced diet, testing blood-glucose levels, and taking medication.

Our research addressed a need to connect the extensive research on psychological constructs of adherence with a linguistic methodology. We identified linguistic indicators of two constructs that have been studied extensively in relation to adherence: *control orientation*,[1] based on locus of control research (Wallston *et al.* 1978), and *agency*, based on self-efficacy (Bandura 1977). Both constructs have been found to be related to medication adherence. By transforming them into linguistically definable features and developing analytic systems to describe them, we offer researchers and caregivers new ways of understanding patient narratives. In the following section, we provide a review of the literature on these two constructs. We then present a linguistic operationalization for each construct: control orientation and agency. The description of the study and the results will follow. In conclusion, we offer implications for patient communication.

## 2.    Review of literature and theoretical frame

### 2.1.    *Control orientation, patient talk, and diabetes management*

One of the most studied psychological constructs related to adherence in chronic diseases has been locus of control (LOC). Numerous researchers (e.g. O'Hea 2003; Hagedoorn *et al.* 2005; Luszczynska and Schwarzer 2005; Trento *et al.* 2007) have studied LOC in efforts to characterize diabetes self-management. According to Rotter (1966: 1), who introduced LOC as a psychological construct within his Social Learning Theory, a person who perceives an event as 'following some action of his own but not being entirely contingent upon his action' is said to have *external* control. A person with external LOC is likely to believe that

events are the results of 'luck, chance, fate' that they are 'under the control of powerful others', or that they are 'unpredictable'. On the other hand, a person who perceives an event as 'contingent upon his own behavior or his own relatively permanent characteristics' is said to have *internal* control (1966: 1).

Following Rotter's (1966) seminal work on LOC, researchers in the medical field began to apply his theories to the domain of health care, renaming the psychological construct Health Locus of Control (HLOC). Much of the early research on HLOC sought to determine the effects of an internal and external orientation on different aspects of illness prevention and management. The bulk of this research found that individuals who hold internal as opposed to external expectancies are more likely to assume responsibility for their health and maintain their physical well-being than those who hold external expectancies (see Strickland 1978 for a review of the literature). Research related specifically to diabetes management has reported similar findings. Lowery and DuCette (1976), for example, discovered that diabetic patients with an internal HLOC orientation possess more relevant information about their disease than those with external HLOC. In fact, after examining the relationships between five dimensions of HLOC (Internal HLOC and the four sub-domains of External HLOC: Chance, Doctors, God, and Other People) and medical regimen adherence in an underserved population with Type 2 diabetes, O'Hea *et al.* (2005: 714) conclude that their results show that internal HLOC is 'the pivotal HLOC belief when predicting health behaviors'.

### 2.2.    *Agency, patient talk, and diabetes management*

Agency has been defined as the 'capacity to make a difference' (Castor and Cooren 2006: 573). Several researchers (e.g. Glasgow *et al.* 2001; Hadjistavro-poulous and Shymkiw 2007) have attempted to identify the factors affecting an individual's health-related agency, or ability to take actions that facilitate the self-management of their chronic health condition. Considerable research has focused specifically on the management of diabetes (e.g. Kavanagh *et al.* 1993; Via and Salyer 1999; Kneckt 2000; Montague *et al.* 2005; Wangberg 2007; O'Hea *et al.* 2009). Agency is closely related to, but not exactly the same as, self-efficacy, which is defined as the conviction that one can successfully perform the actions needed to acquire a particular outcome (Bandura 1977). Essentially, both agency and self-efficacy are concerned with a person acting positively to improve his or her own health.

As with locus of control, or control orientation as we call it, the most common measures of self-efficacy or agency have been surveys (e.g. Schwarzer and Jerusalem 1995; Lorig *et al.* 1996; Bandura 1997; Anderson *et al.* 2000). Generally, these instruments consist of items asking respondents to rate how confident they are that they can complete a particular action (e.g. eat healthful foods, carry out exercise intentions, do aerobic exercise three to four times each week). Identifying specific linguistic features of patients' positive action can provide a useful framework for expanding the study of the relationship between agency and diabetes management.

## 3.    Study

### 3.1.  Data

The data came from an investigation of adherence among people with type 2 diabetes conducted by an interdisciplinary research team consisting of linguists, communication studies specialists, sociologists, and an endocrinologist at the Indiana Center for Intercultural Communication (ICIC) at Indiana University-Purdue University, Indianapolis (IUPUI). In-depth interviews were conducted with 43 English-speaking subjects with diabetes in the Indianapolis area. Twenty-eight subjects were recruited from two university/community health centers using a patient recruitment service. The remaining 15 subjects were recruited through advertisements and flyers.

All subjects signed a consent form prior to the interview. Interviews were completed at a time and place that was convenient for the subjects. Some of the interviews were conducted in the subject's home; many were conducted in a private room on the university campus. The interviews were semi-structured and were conducted using an interview protocol that consisted of multiple sections. In the first section, subjects were invited to share their 'life story' of living with diabetes, prompted by 14 open-ended questions such as: 'When were you first diagnosed with diabetes? Can you tell me about that – what was said, how did you feel?' Subsequent segments of the interview included questions about medication adherence, information sources and use, and literacy level, as well as basic demographic information. The focus of the present paper is on the first section, the open-ended questions. All interviews were audio- and video-recorded. The interviews were transcribed using the audio-recordings except for those that contained unintelligible segments or corrupt data, in which case the video-recording was also consulted.

The demographic profile of the subjects can be found in Table 1.

Table 1: *Subject characteristics (N = 43)*

| CHARACTERISTIC | MEAN (SD) | N (%) |
|---|---|---|
| Years with Illness | 7.6 (7.9) | |
| Age | 51.2 (10.1) | |
| Gender | | |
| Male | | 21 (49) |
| Female | | 22 (51) |
| Race | | |
| Non-Hispanic White | | 23 (53) |
| Non-Hispanic Black | | 15 (35) |
| Hispanic | | 1 (2) |
| Other (also includes two or more races) | | 4 (9) |
| Education | | |
| Less than High School | | 9 (21) |
| HS or GED equivalent | | 15 (35) |
| More than HS | | 19 (44) |
| Income | | |
| Less than $15,000 | | 18 (45) |
| Between $15,000 and $29,999 | | 7 (18) |
| Between $30,000 and $59,999 | | 12 (30) |
| $60,000 or above | | 3 (7) |

Note: Information not available for all subjects for some of the characteristics (Years ill n=41, and income, n = 40)

Table 1 shows that the average number of years living with diabetes was 7.6 and the average age was 51. The gender distribution was almost equal, 21 men and 22 women. Forty-four per cent of the interviewees had some education beyond high school and there was a wide range of incomes represented in the sample.

### 3.2.  Methods of analysis

This section describes the development of the linguistic systems coding rubrics, as well as the steps taken in applying the completed rubrics to the transcripts by the coders.

The first stage in the process of coding involved members of the research team providing holistic coding (internal vs. external for control orientation, high vs. moderate vs. low agency) using a sample of 20 transcripts. The four coders (trained linguists) had spent four months as a team studying the literature behind the concepts of adherence and control orientation and agency. In this first transcript coding, they were also asked to identify specific wording

instantiating control orientation and agency. The second stage in the research consisted of the development of the linguistic feature systems for both control orientation and agency based on the specific wording in the same sample of 20 transcripts. This stage involved intensive teamwork while drafting and revising rubrics.

In the next stage of the process, the four coders worked individually to code the same five transcripts using the coding rubric of the linguistic feature systems to identify patient categories (i.e. internal vs. external, high vs. moderate vs. low agency). The four coders then met to check inter-rater reliability, which was 93 percent. In addition to computing inter-rater reliability, the coders made final modifications to the coding rubric.

Because the percentage of agreement among the four coders was relatively high, we were confident that they were using the coding systems uniformly. Subsequently, three of the coders were assigned five additional transcripts each to code individually. To ensure that they continued to use the coding rubric reliably, all three of the coders also analyzed the same three additional transcripts, for which an overall level of agreement of 92 percent was achieved. The remaining transcripts were assigned individually to these three coders. As a final verification of inter-rater reliability, all three coded the same three transcripts at the final coding session, and percentage of agreement on these transcripts was also over 90 percent. We believe that the validity and reliability of the linguistic feature systems to identify internal vs. external control and high vs. moderate vs. low agency were well established using the process described above.

The next two sections describe the developed linguistic features in detail, including the linguistic background of each feature.

### 3.2.1. *The system of linguistic features of control orientation*

The in-depth textual analyses of control orientation produced linguistic features that disclose a subject's control orientation beliefs (i.e. either internal or external) towards various aspects of managing their disease. These features include semantic roles (i.e. agent for internal and patient, recipient, and beneficiary for external), metaphors, idioms, certain characterizations of the self, claims to knowledge or ignorance, and the use of vague vs. detailed language. These linguistic features were found to be the most prominent distinguishing factors between subjects with internal and external control in our data. A list of features appears along with relevant examples

extracted from the data in Table 2.

The first linguistic feature of control orientation listed in Table 2 is the *semantic role*, used when retelling events related to the diagnosis and management of diabetes. A semantic role 'refers to the way in which the referent of the noun phrase contributes to the state, action, or situation described by the sentence' (Finegan 2008: 198). In other words, 'Semantic role is a way of characterizing the meaning relationship between a noun phrase and the verb of a sentence' (2008: 198). In our data, three semantic roles characterize a person with external control orientation beliefs: patient (i.e. the entity that undergoes a certain change of state); recipient (i.e. that which receives a physical object); and beneficiary (i.e. that for which an action is performed). These roles are in contrast to the single semantic role, which characterizes a person with internal control orientation beliefs: agent (i.e. the responsible initiator of an action) (see Table 2 for examples).

Control orientation is also found in *metaphors* used by the subjects. According to Lakoff and Johnson (1980: 5), 'The essence of metaphor is understanding and experiencing one kind of thing in terms of another'. Specifically, a subject with external control orientation beliefs uses metaphors that conceptualize diabetes as an opponent who is dominating and/or conquering him or her, while a subject with internal control orientation beliefs uses metaphors that conceptualize diabetes as an opponent to be dominated and/or conquered by the subject (Table 2).

In addition to metaphors, a person's control orientation beliefs are revealed through certain *idioms* or expressions whose meaning cannot be entirely understood from the meaning of each word in the phrase (Biber *et al.* 1999: 1024). Subjects who hold external control orientation beliefs use idioms which explain events that occur in their life or cause and effect relationships as the result of luck, chance, God, or fate, or the way things are or work. Generally, the idioms which denote external beliefs are marked by the way they exclude the subject as having a role in either the contraction of diabetes or outcomes of aspects of its management. Conversely, idioms used by subjects who hold internal beliefs are marked by the way in which they describe themselves as having control of events in their life related to diabetes (Table 2).

*Characterizations of the self* often reveal the control orientation beliefs of a subject as well. External beliefs are characterized in such a way as to relinquish responsibility for an action with the potential to be detrimental to one's health and/or was not a part

Table 2: *Most prominent linguistic realizations of control orientation*

| LINGUISTIC FEATURES CODED AS EXTERNAL CONTROL ORIENTATION | LINGUISTIC FEATURES CODED AS INTERNAL CONTROL ORIENTATION |
| --- | --- |
| *Semantic role* | *Semantic role* |
| 'she [wife] had me keep a little where I took my blood sugar every day' (Patient) | 'I check my feet every night before I go to bed' (Agent) |
| 'he [brother] gave me some papers that had uhm diet food on it different portion sizes and all that stuff' (Recipient) | |
| 'my daughter fixes my food' (Beneficiary) | |
| *Metaphor* | *Metaphor* |
| 'it [diabetes] was hid back there and like hid out something […] then it jumped on me and said I'm here now' | 'I can whoop it and fight it [diabetes]' |
| 'the diabetes just kinda you know stirs stirred up a hornet's nest' | 'if you work out diabetes gets mad […] it hurts diabetes when you working out' |
| *Idiom* | *Idiom* |
| 'So far I've been pretty lucky that I haven't had to take any insulin or you know pills' | 'I'm really on my Ps and Qs' |
| 'I have a chance to get it [diabetes] under control' | 'The idea is to stay with it [managing blood glucose levels]' |
| 'That's [low blood glucose levels] just the way it happens sometimes' | |
| *Characterizations of self* | *Characterizations of self* |
| 'unfortunately I'm a sweetaholic I love sweets […] if they didn't make sweets I probably wouldn't be a type two' | 'I'm the type of person that's willing to learn things' |
| 'I'm not like a real exercise person' | 'I'm the type of person who will go from one extreme to the other [i.e. able to change habits quickly]' |
| *Claims of ignorance or forgetfulness* | *Knowledge of diabetes* |
| 'I don't really know what it [diabetes] is' | 'I know everything it takes to get healthy […] I know the right foods to eat […] I know the exercise I need to do' |
| 'when I go out I forget to bring the medicines with me' | 'I'm fairly well educated from the outset on the disease' |
| *Vague language in relation to medicine and diabetes* | *Detailed/descriptive language and/or medical jargon* |
| 'I'm taking two medications and *things like that*' | 'There's type one […] which is the autoimmune reaction where the body basically decides uh pancreas or the islets of langerhans are a foreign body and decides to destroy them' |
| 'It's [blood glucose levels] up to two hundred or two fifty or *whatever*' | |

of one's diabetic management regimen. For example, a subject who continued to eat too many sweets after being diagnosed with diabetes might explain his or her behavior as uncontrollable or unchangeable because he or she is 'a sweetaholic'. Conversely, those with internal beliefs characterize themselves as in control of their behavior, for example: 'I'm a take-charge kind of guy' (Table 2).

Talk about one's *knowledge of diabetes* and its management was expressed in different ways. External beliefs are expressed in frequent *claims of ignorance or forgetfulness*, for example: 'sometimes I forget I

don't remember [to take pills]'. By contrast, internal beliefs are expressed in claims about knowledge of aspects of their disease and its management, for example: 'I know if I sit around for a couple of days and don't do anything my body just completely breaks down'. Moreover, external beliefs are closely related to claims of knowledge or ignorance and are characterized by the use of more vague language to talk about the management of diabetes, with an indication of less knowledge about the disease and its management. Internal beliefs are characterized by detailed descriptive language and/or medical jargon, revealing their concern about and knowledge of their disease and its management (Table 2).

In addition to the previously described linguistic realizations, there is also variation in the vagueness of language use related to medicine and diabetes. External control orientation is expressed in vague language such as 'stuff', while internal orientation manifests itself in more detailed language and medical jargon.

This set of features in Table 2 provides a usable rating system to distinguish subject types, which can be used for listening to understand patients and subsequent intervention communication (Lauten *et al.* 2010).

### 3.2.2. *The system of linguistic features of agency*

The linguistic realizations that denote a subject's agency were identified. Agency was operationalized as the degree of action the interviewee reported taking vis-à-vis adherence to current diabetes regimen recommendations. In this operationalization of agency, a subject who could otherwise be considered highly agentive received a *low* agency coding if the action taken was detrimental to his or her diabetic health or contrary to current diabetic care recommendations. For example, one subject said of her insulin injections: 'I did not want to do any injections and I read all the side effects and I just decided that I wasn't gonna do it'. In this example, the patient shows a conscious decision not to perform an action. Conventionally, this would be considered a highly agentive action. However, because not taking recommended insulin injections is contrary to current diabetic care recommendations, this action received a *low* score in our coding scheme because, for our purposes here, we coded for adherence to recommended actions in full recognition of the importance of a subject's right to personal medical choices.

In the first round of analysis, a subject's gestalt agency was analyzed (i.e. without consideration of the type of action taken or not taken). In this preliminary analysis, the subject received one agency score in a tripartite system of *high*, *moderate*, or *low* agency. After completing the first round of open coding, agency talk was found to differ, sometimes greatly, for a subject depending on the domain of diabetes management (e.g. exercise). Therefore, in the final analysis, agency was coded across six domains for each subject: Medication Adherence, Information and Support Seeking Behavior, Food Management, Exercise Management, Medical Management, and General Diabetes Management.[2] In the final system, a subject's agency could fall into one of four categories for each domain: *high*, *moderate*, *low*, or *not articulated* if the subject did not talk about his or her actions in a particular domain.

A subject's level of agency was determined by particular linguistic cues used to describe action or inaction with regard to managing diabetes. The language of agency is manifest in specific lexical and grammatical categorizations; however, agency can be understood in broader terms as well. Specifically, coders considered the way in which subjects expressed action (i.e. behaviors the subject reported actually engaging in), stance (i.e. attitude toward or assessment/evaluation of their actions), and intensity (i.e. the degree of intensity or commitment with which the subject reports doing an action or the degree of intensity of the subject's evaluation/assessment of his/her actions). The linguistic realizations of agency are delineated and examples from the data can be found in Table 3.

First, agency is expressed through the subjects' use of *propositions* (i.e. unembellished reporting of actual action or inaction). In the case of high agency, the subject uses propositions to report engagement in an action that is beneficial to the management of their disease, while low agency propositions reveal the subject's failure to engage in a healthy behavior, a diminished engagement in a healthy behavior or engagement in an unhealthy behavior; moderate agency is mainly expressed through the use of the verb 'try' in propositional statements.

The expression of the level of *intensity* in which a subject describes a particular action along with *stance* is also important in identifying a subject's level of agency. To express the intensity in which they complete an action, subjects use adverbials of extent/degree, adverbials of manner, and adverbial clauses of time. Adverbials of extent/degree 'add information about the action or state described in the clause, answering such questions as how much, and to what extent' the subject did or did not engage in a certain behavior (Biber *et al.* 1999: 762). Furthermore, these adverbials are used to express the level of intensity of an action in both exact terms (e.g. 'everyday') or more generally (e.g. 'quite frequently'). In addition to adverbials of extent/degree, subjects use adverbials

Table 3: *Most prominent linguistic realizations of agency*

| | HIGH AGENCY | MODERATE AGENCY | LOW AGENCY |
|---|---|---|---|
| *Propositions* | 'I exercise' (domain: exercise management) | 'I do try to exercise' (exercise management) | 'It's [exercise] stopping' (exercise management) |
| | 'I also keep track of you know how much portions I'm suppose to have' (food management) | 'I try to eat well' (food management) | 'I went on an eating binge' (food management) |
| *Intensity and Stance* | | | |
| Single adverbs of extent/ degree & manner | 'I've been taking my medications *constantly*' (medication adherence) | 'I took medicine *occasionally*' (medication adherence) | 'I didn't take it [medication] *anymore*' (medication adherence) |
| | 'I ran *everyday*' (exercise management) | 'I *usually* exercise' (exercise management) | 'I crave sweets *constantly*' (food management) |
| | 'I've been seeing him [doctor] *quite frequently*' (medical management) | 'I couldn't *hardly* manage it' (general diabetes management) | 'I've *never* gone to the library on it' (information and support seeking behavior) |
| | 'I see my doctor so *regularly*' (medical management) | 'I *rarely* eat the grits' (food management) | 'I used to have problems *consistently* [with low blood sugar]' (medical management) |
| | 'I was uhm *diligently* [taking care of blood glucose levels]' (medical management) | | |
| Adverbial clauses of time | | 'I've had it [blood glucose level] as low as sixty *when I'm watching it*' (medical management) | |
| Hedges | | 'I see my doctor *kind of* on a regular basis' (medical management) | |
| Premodifying stance adverbs | 'I *really* started managing it [diabetes]' (general diabetes management) | 'I *pretty much* follow a 1500 to 1800 calorie diet' (food management) | 'It's *very hard* for me to avoid it [sweet food]' (food management) |

of manner (e.g. 'diligently'), a subcategory of process circumstance adverbials, to describe the manner in which an action was carried out.

Lastly, a subject's level of agency is conveyed through stance or personal feelings, attitudes, value judgments, or assessments the subjects express concerning their disease management actions or inactions in addition to propositional content (Biber *et al.* 1999). In our data, stance was expressed through hedges and premodifying stance adverbs.

Hedges indicate a moderate level of agency since they convey an imprecise level of engagement in an action, thereby diminishing the strength of the reported action taken. Premodifying stance adverbs describe subjects' feelings toward or evaluation of their actions. Subjects with low agency often describe an action as difficult or hard for them to do or avoid while those with high agency tend to use adverbs that express a serious attitude toward the completion of a healthy action. Those with a moderate level of agency use premodifying adverbs to express a more relaxed attitude toward engaging in action. However, they do report engaging in a healthy action, which distinguishes them from those with low agency. As in the case of control orientation, the system includes the most prominent features that identify levels of agency in patient interviews and can be used for intervention communication.

## 4.    Results of the application of the systems in the data

The transcripts were analyzed using the coding rubrics as described in the Methods of Analysis (3.2) section. After the coders applied the linguistic system of control orientation as described in Table 2, 35 (81% of sample) were identified as external orientation, while eight (19% of sample) were identified as internal orientation. Table 4 presents the frequency and percentage of individuals in each of the Agency categories after the coders had applied the linguistic systems described in Table **3**.

Table 4: *Number and percentage of individuals in each Agency domain category*

| VARIABLE | N (%) | VARIABLE | N (%) |
|---|---|---|---|
| Medication Agency | | Medical Management Agency | |
| High | 29 (67) | High | 32 (74) |
| Moderate | 8 (19) | Moderate | 7 (16) |
| Low | 2 (5) | Low | 4 (9) |
| Not Articulated* | 4 (9) | Not Articulated* | 0 (0) |
| | | | |
| Information Search Agency | | General Diabetes Management Agency | |
| High | 21 (49) | High | 10 (23) |
| Moderate | 8 (19) | Moderate | 26 (60) |
| Low | 9 (21) | Low | 4 (9) |
| Not Articulated* | 5 (12) | Not Articulated* | 3 (7) |
| | | | |
| Food Agency | | Exercise Agency | |
| High | 16 (37) | High | 12 (28) |
| Moderate | 19 (44) | Moderate | 12 (28) |
| Low | 8 (19) | Low | 9 (21) |
| Not Articulated* | 0 (0) | Not Articulated* | 10 (23) |

*The patient transcript contains no reference to this agency domain

The talk of the majority of interviewees in our study (35 individuals, or 81%) was characterized predominantly by linguistic indicators of external control orientation. Only eight individuals (or 19%) expressed primarily internal control orientation in their talk. These results suggest that the majority of the interviewees talk about their diabetes as something that is beyond their control.

This finding is particularly interesting in light of the results related to agency because generally the words of these interviewees indicated a moderate or high degree of agency. Thirty-four (74% of the

sample) of the interviewees exhibited High Medical Management Agency in their talk about scheduling and attending doctor's appointments, monitoring blood glucose levels, and checking skin and feet. Twenty-nine individuals (67% of the sample) were classified as having High Medication Agency. The domains in which the lowest agency was identified in patients' talk were related to managing diet (19% were rated as Low Food Agency) and exercise (21% were rated as Low Exercise Agency).

## 5.    Conclusion

In this study, we interviewed patients with diabetes in order to identify the most prominent linguistic indicators of two constructs that have been found to be important factors in models of health self-management: control orientation and agency. Coding systems were developed for each of these constructs. The coding systems were then applied to 43 patient interview transcripts, and high inter-rater reliability was attained.

This study contributes to the recognized need to examine patients' perspectives through their own accounts. Our research combined a qualitative and quantitative approach in analyzing patient data. We believe the systems we have developed will be useful for 1) continued analysis of patient talk, and 2) analysis and modification of doctor-patient interactions.

First, the coding systems that were developed to identify patient types are available for researchers. When used appropriately, they provide quantifiable results for linguistically oriented research. Certainly, a limitation of this study is the small sample size, and so further studies using these systems with larger numbers of subjects are needed. Longitudinal studies, in which the same patients' health perceptions toward adherence will be assessed using the linguistic coding systems, should also be carried out to provide more information about the stability of the constructs of control orientation and agency. In addition, future research can focus on developing and studying the outcomes of interventions based on the understanding of these patients' perceptions.

Second, the coding system can be used to train health care providers to listen attentively to patients and pick up on verbal cues (Tables 2 and 3) to better understand what is revealed by how a patient talks. Since daily self-care health behaviors are recommended to patients with a chronic illness such as diabetes, it is important for health care providers to

have a good understanding of the extent to which a patient follows these recommendations. Providers also need clues to understand how to communicate effectively on an individual basis. By listening to and analyzing patient talk regarding diabetes management following the linguistic systems developed in our study, health care professionals will be better able to assess patients' control orientation and agency.

To assess control orientation, several features of the system can be integrated into a training program for health care professionals about what to *listen* for when a patient speaks. These include: are things described as happening to or for the patient (external), or is the patient a responsible initiator of the action (internal)? Are metaphors and self-characterizations those of being dominated or of relinquishing responsibility (external), or of dominating or taking responsibility (internal)? Does the patient use vague language or claim to not know or forget what to do (external)? Does the patient give detailed reports that show knowledge of diabetes and its care (internal) (see Table 2)?

To assess agency, among other linguistic cues, health care professionals can be taught to listen for such things as propositions that include the use of 'try' with a verb that indicates lower agency; adverbs like 'constantly' or 'never' that ascribe intensity to an action; and hedges such as 'kind of' that show lower agency (Table 3). By better understanding these two important characteristics of the patient (i.e. control orientation and agency), health care professionals can then modify and target their own language accordingly.

While considering control orientation and agency separately one from the other can give clues to how a person is managing his or her diabetes and how to communicate more effectively with that person, we believe that understanding how these two constructs interact and then creating communication recommendations that address both states would be the most effective communication approach. Future intervention studies will need to address these possibilities.

## Notes

1. The term *control orientation* is used as a way to distinguish between the established psychological construct of locus of control and our linguistically defined coding system based in locus of control research. Scales exist for measuring locus of control and health locus of control, so to differentiate what we have coded through

our linguistic analysis in this study, we adopted the term *control orientation*.
2. The Medical Management domain covered such diabetes management behaviors as scheduling and attending doctor's appointments, monitoring blood glucose levels, and checking skin and feet while the General Management domain was created for talk about diabetic management behavior that was too general (e.g. 'I do take care of myself') to be able to place within a specific domain, but which was nonetheless important in characterizing the agency of the patient.

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