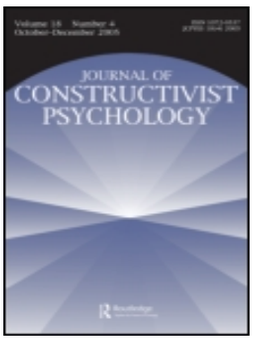

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Journal of Constructivist Psychology

ISSN: 1072-0537 (Print) 1521-0650 (Online) Journal homepage: http://www.tandfonline.com/loi/upcy20

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To cite this article: Rebecca J. Kelly , Robert A. Neimeyer & David. J. Wark (2011) Cognitive Anxiety and the Decision to Seek Services for Hearing Problems, Journal of Constructivist Psychology, 24:2, 168-179

To link to this article: http://dx.doi.org/10.1080/10720531003799691

Journal of Constructivist Psychology, 24: 168–179, 2011

ISSN: 1072-0537 print / 1521-0650 online
DOI: 10.1080/10720531003799691

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COGNITIVE ANXIETY AND THE DECISION TO SEEK SERVICES FOR HEARING PROBLEMS

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The purpose of this study was to examine the relationship between a transient state anxiety measure (cognitive anxiety) and the decision to consult for hearing services in older adults. Cognitive anxiety was measured using a content analytic scheme grounded in personal construct psychology. A total of 93 adults with hearing impairment between the ages of 65 and 80 years participated in this study and comprised three groups that occupied different points in the consultation process: a nonconsulting group living in the community, a consulting group seeking evaluation and treatment for hearing impairment, and a group who had received communication consultation and hearing aids. No between-group differences were observed on demographic or objective audiologic measures of hearing impairment. However, as predicted, those who were actively seeking consultation for hearing impairment displayed the highest level of cognitive anxiety, and those who had received consultation and assistance the least, suggesting that difficulties anticipating and interpreting communication situations may play an instigating role in the decision to seek services for hearing impairment.

In recent years the field of audiology has broadened its concern from a traditional focus on the assessment and remediation of hearing problems to a consideration of the "whole person" experiencing difficulties with impairment of hearing (Hickson & Worrall, 2001; Scarinci, Worrall, & Hickson, 2009). This acknowledgment of the environmental and contextual factors associated with functioning has its roots in the *International Classification of Function, Disability, and Health* (*ICF*; World Health Organization, 2001). As one expression of this trend, researchers have attempted to uncover the relationship between anxiety and adjustment to hearing impairment, with mixed results. Erdman

Received 15 February 2010; accepted 15 March 2010.
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and Demorest (1996) reported that anxiety scores for a large heterogeneous sample of adults with hearing impairment closely resemble the scores of the general population. Andersson and Green (1995) examined the relationship between experiences of hearing impairment and anxiety in older adults. They concluded that although anxiety scores did not correlate with audiometric testing, they did correlate with self-perceived hearing handicap. Similarly, Saunders and Cienkowski (1996) found that anxiety accounted for nearly 14% of the variance in self-reported hearing handicap. Gatehouse (1994) found anxiety accounted for nearly 10% of the variance in the social and psychological effect of experiencing difficult listening situations. In summary, although adults with hearing impairment do not differ markedly from peers with normal hearing on conventional anxiety measures, evidence is accruing that at least a subset of those with hearing problems experience heightened anxiety, particularly when their hearing problems complicate their engagement in communication situations.

One limitation in many of these studies is that researchers have operationalized the construct of anxiety as a personality trait and have used self-report measures that presume it is a general characteristic of the respondent, one of which he or she is consciously aware. The purpose of this study was to examine the relationship between anxiety and hearing impairment from a different perspective, one informed by George Kelly's (1955) psychology of personal constructs. In Kelly's theory, all persons are assumed to function as incipient scientists who strive to understand, predict, and in some measure control their worlds and, perhaps most critically, their "role relationships" with significant others. When they are unable to do so, people experience anxiety, defined in personal construct terms as "the awareness that the events with which one is confronted lie mostly outside the range of convenience of his construct system" (G. A. Kelly, 1955; p. 565). In a social context, when people's personal constructs prove insufficient to meaningfully interpret and anticipate the course of events, they experience a transitory state of predictive uncertainty. Importantly, although in many psychological theories anxiety is construed in psychopathological terms, Kelly emphasized that personal construct psychology "concerns itself primarily with the affirmative processes in man's ongoing quest" (p. 1111), and

that, in this sense, anxiety can "help a client find grounds for taking needed action" (p. 901).

In keeping with this constructivist perspective, Viney and Westbrook (1976) theorized that people experience anxiety when they are unable to fully construe events they encounter and when the implications of these events are not clear. In an audiological context, it is likely that a person with a hearing impairment will experience cognitive anxiety in this sense. For example, a person with hearing impairment has reduced access to the auditory signal and is therefore likely to have difficulty knowing when people are speaking or what they are saying, making it difficult to anticipate and participate meaningfully in social interactions that involve communication. The person is only aware of the instances when the speech is audible and is unaware of the instances when speech is not audible. To the person with hearing impairment, it is difficult to predict when the communication will break down because of what is not being heard. This uncertainty in turn gives rise to a *state* (not necessarily a *trait*) of anxiety in such circumstances. Anxiety can therefore serve a function, as one of the factors that drive people to seek services for their hearing impairment. According to this hypothesis, cognitive anxiety typically would be moderate for people living with some degree of hearing impairment, but would be greater at the point when they make the decision to consult for services. Cognitive anxiety would be lowest after people have consulted for services and begun rehabilitation. That is, the experience of cognitive anxiety through the consultation process would not be linear.

In the present study, the construct of anxiety was operationalized as a transient state that was measured through the use of content analysis. The Cognitive Anxiety Scale (CAS; Viney & Westbrook, 1976) was used to assess this state because it can be tailored readily to permit coding the content of participants' descriptions of their experience, in this case as people with hearing problems. The benefits of using a content analysis rather than a standardized questionnaire are that it does not rely on participants' self-awareness of feeling tense or nervous, and it is by definition relevant to their personal concerns. In summary, the CAS allows participants to respond to elicitation questions that relate directly to their experience as individuals living with hearing impairment rather than a more traditional assessment of anxiety. We

therefore sought to study three groups of older adults with hearing problems: (a) those who had not yet decided to consult a professional about their impairment, (b) those who were pursuing an initial evaluation of their hearing impairment, and (c) those who had undergone audiologic evaluation and been fitted with a hearing aid. We predicted that the second, initial consultation group would evidence the highest levels of cognitive anxiety about their daily experience and the third group, who had received both consultation and hearing aids, would display the lowest levels of cognitive anxiety of the three conditions.

Method

Participants

Data were collected for three groups of adults with hearing impairment. There were 31 participants in each group. The self-reported ethnic identity for all participants was "Caucasian." One nonconsulting (NC) group consisted of adults who self-identified as having hearing impairment but who had not consulted for services. There were 18 males and 13 females in the NC group. The mean age for this group was 72.77 years, with a standard deviation of 4.30 years. Their mean better ear puretone average (i.e., behavioral threshold response in dB HL when presented with auditory stimuli at .5, 1, 2 kHz) was 32.0 dB, with a standard deviation of 10.95 dB. The other two groups consisted of adults with hearing impairment who presented for hearing services and purchased hearing aids for the first time. Data for one group of consulters (C1) were collected at the time of their initial consultation appointment. There were 17 males in this group and 14 females. The mean age for this group was 70.56 years, with a standard deviation of 4.72 years. The mean better ear puretone average for this group was 30.48 dB, with a standard deviation of 8.37 dB. Data for the other group of consulters (C2) were collected within 30 days of their initial consultation appointment, after they had been wearing hearing aids. There were 20 males in this group and 11 females. The mean age for this group was 73.11 years, with a standard deviation of 6.18 years. The mean better ear puretone average for this group was 33.5 dB, with a standard deviation of 9.15 dB.

Procedures

Following institutional review and approval of the project, participants for the NC group were recruited from the Phoenix metropolitan area. Advertisements for participation in the study were placed in community newspapers flyers. Participants for the consulting groups (C1, C2) were recruited from two hearing aid-based audiology practices: one in the Phoenix metropolitan area and one in the San Francisco metropolitan area. Because most previous studies of adjustment to hearing impairment have focused on older adults, the participants in this study were limited to individuals between the ages of 65 and 80.

All participants were scheduled for a single data collection session. Participants in the NC group were recruited from the community and contacted directly to schedule the session. Participants in the C1 group were recruited from the two hearing aid practices that had consented to participate in the study, and data collection was scheduled at the time of their initial consultation. Participants in the C2 group were recruited from the same hearing aid practices, and data collection was scheduled at the time of a follow-up appointment within 30 days of their initial consultation. Participants in both consulting groups met with their audiologists immediately after the data collection session.

Participants received an audiologic evaluation in a double-walled sound-attenuating booth. Puretone air conduction thresholds were obtained for both ears at octave intervals between 250 and 8000 Hz. The extent of hearing impairment was classified according to the puretone average (PTA); that is, the average of the hearing thresholds at 500, 1000, and 2000 Hz. The PTA is closely related to the threshold of hearing for speech. Because hearing is a binaural phenomenon, the better puretone average (BPTA) for each participant was used to provide a functional description of hearing ability. Puretone bone conduction thresholds were obtained at octave intervals between 250 and 4000 Hz, with clinical masking employed when required. Using this information, the type and configuration of hearing impairment were evaluated.

Following the audiologic evaluation, participants were interviewed in a quiet room to obtain data for the content analysis. Interviews were recorded on either an IRiver 120 HP or an Olympus DS 4000 digital recorder. A single investigator, who was a licensed

audiologist holding the certificate of clinical competence (CCC-A) in audiology (Rebecca J. Kelly), conducted all interviews. Elicitation prompts were derived from Viney and Westbrook (1976). Participants were asked to respond to the following prompt from the investigator:

> Thank you for agreeing to talk with me about your experience. I want to make sure I fully understand your experience, so I'm going to record this interview. I'd like you to talk to me for about 5 minutes about your life at the moment—the good things and the bad things—what is it like for you, as a person with hearing problems? Once you start talking, I'll be here listening to you; but I'd rather not reply to any questions you may have until 5 minutes are over. Do you have any questions now, before we begin?

The investigator conducted and transcribed each interview and stored the data in a word processing document. The transcript file was converted to a text file for use in the Analyse (Viney, Caputi, & Webster, 2000) content analysis computer program. The computer program allows the user, in this case the principal investigator (Rebecca J. Kelly), to define and score clauses in the transcript. Guidelines for this process were provided by Viney and Westbrook (1976) and were further refined for use in communication disorders research by DiLollo and colleagues (DiLollo, Manning, & Neimeyer, 2003; DiLollo & Neimeyer, 2008). These refinements were adopted as the basis of the guidelines used in this study.

In order to establish interrater reliability for this study, pilot data were collected to establish coding and scoring guidelines. Three researchers collaborated to establish the revised guidelines, which are shown in Figure 1. After a clause was defined, it was scored and a weight was assigned. When a clause contained emphasis, either by adverb or repetition, an extra point of weighting was applied. The subject of the clause determined the weighting. If the subject was stated in the first person (e.g., "I felt . . ."), the weighting was Ca3. If the subject was a generalization or another person, the weighting was Cb2. The denial of cognitive anxiety was assigned a weight of Cd1 only if it was directly stated. Figure 2 provides an example of a partial transcript with scoring applied.

As a measure of interrater reliability for this study, approximately 20% of the transcripts for each group were randomly

Criteria for identifying clauses	*Examples*
Expression of complete thought	"I've had a hearing problem since childhood" "Now I can hear"
Contains noun and verb	"and that would upset me" "as I look back on it"
Contains unique thought	"which is so stupid" "and also in a restaurant"

Guidelines for scoring clauses

1) Score each clause only once.
2) When a clause emphasizes another clause, score it separately.
3) Score a clause when it indicates *difficulty in comprehension.*
4) Score a clause when it implies that experience was *not meaningfully integrated*.
5) Score a clause when it implies *little or no experience* with topic.
6) Score a clause if it reflects *uncertainty* about topic.
7) Score a clause if it implies feelings of *guilt or deception* related to topic.
8) Score a clause if it implies *denial* of topic.
9) Score a clause if it directly states the individual can *only speculate* about topic.
10) Don't score a clause when the speculation is implied or unclear.
11) Score a clause when it indicates *surprise that is interpreted as meaning the prediction was inaccurate.*
12) Score a clause when it reflects a question that indicates a *lack of understanding*.
13) Score a clause when it reflects a question that is *a whole or partial repetition* of the original question.
14) Don't score a clause when it is merely requesting information.
15) Score a clause when a cognitive response was *not available* or *not in the person's repertoire.*
16) Don't score a clause if the response was omitted by choice.
17) Don't score a clause if the response refers to forgetting or not remembering.
18) Don't score the clause "I don't know what else to say."

FIGURE 1 Guidelines for identifying and scoring clauses.

selected to be coded by two other members of the research team, who were either licensed audiologists or communication disorders graduate students, using the revised guidelines. Interrater reliability was calculated using coefficient kappa (Cohen, 1960). Across all three groups and within each group taken separately, kappa values exceeded the criteria established by Fleiss (1981) for "excellent" agreement, ranging from .827 to .861.

Results

T-tests revealed there were no significant differences between the groups on the demographic or audiometric variables. In addition, there were no significant differences between the sites (Phoenix vs. San Francisco) on any study variable. *T* tests with a Bonferroni correction ($p = 0.016$) revealed there were significant differences between the groups on their CAS scores. As predicted,

I don't know where to start [Ca3] talking about my life. *It gets to be a little confusing at times [Cb2]* because *I can't understand people when they talk [Ca3].* And *before this happened I could understand [Ca3]. Now I have a problem understanding [Ca3]*. After my accident, as I'll call it now, *all of a sudden it's like uhoh I can't hear anymore [Ca3]. I don't seem to be able to grasp what people are telling me [Ca3]. It's just frustrating [Cb2]. I don't know [Ca3].* I'm always not being able to understand what people say. *I have to keep questioning what they said [Ca3]. I guess it works on you after a while [Cb2]. My wife, she don't understand [Cb2]* what I'm going through. *People just don't realize what it's like, you know [Cb2]. And I don't know how to explain it [Ca3]*. I keep having to repeat myself *and that's very frustrating [Cb2] . Sometimes I just try to figure out what was said and how come and just pass it off that way [Ca3].*

FIGURE 2 Example of partial transcript indicating cognitive anxiety scoring applied. *Note:* Clauses coded for cognitive anxiety appear in italics. Clauses receiving special weighting are indicated in brackets.

participants in the C1 group had significantly higher CAS scores ($M = 1.01$, $SD = 0.356$) than participants in the NC ($M = 0.725$, $SD = 0.309$) and C2 groups ($M = 0.53$, $SD = 0.319$); $t(60) = 3.3662$, $p = 0.0013$ and $t(60) = 5.647$, $p = 0.0001$, respectively. Participants in the NC group also exhibited significantly higher CAS scores than participants in the C2 group; $t(60) = 2.5325$, $p = 0.014$, also as hypothesized.

Discussion

In personal construct terms, anxiety relating to a specific situation will be relatively low when a person either accurately predicts events or is unaware that the current construct system is not providing useful predictions. In keeping with this rationale, participants in the nonconsulting (NC) group exhibited low anxiety when discussing their hearing impairment. Although acknowledging their hearing impairment, these participants reported being able to make useful predictions about communication events, either because they were not experiencing many communication breakdowns or because they were experiencing them in predictable ways. As a result, the level of cognitive anxiety in their responses was lower than participants in the initial consultation (C1) group.

In contrast, participants in the initial consultation (C1) group exhibited high cognitive anxiety when discussing their hearing impairments. These participants were not able to use

their construct systems to make useful predictions about communication events. Because in personal construct terms people are seen as meaning-makers who strive to make predictions about the world, when they are unable to do so, they may experience uncomfortable emotions that in turn are likely to prompt them to seek services.

Finally, as predicted, participants in the hearing aid (C2) group exhibited the lowest cognitive anxiety scores of all groups when discussing their hearing impairments. These participants had completed the consultation process and were beginning the process of rehabilitation. All of the participants in this group had purchased hearing aids and received information about effective communication with their partners. The provision of hearing aids resulted in bringing previously inaudible speech into the audible range, reducing the number of communication breakdowns. Information about communication strategies also may have provided these participants with ways to make their construct systems more useful. For example, participants learned about the impact that distance from the speaker can have on effective communication and how best to manage adverse hearing environments, which could help them to avoid communication breakdowns and accurately predict when they are likely to occur.

Limitations

Although the present investigation benefited from its grounding in a systematic constructivist theory, from the recruitment of reasonably large samples of participants with hearing impairments, from the use of individualized interviews to elicit accounts of participants' experience, from objective audiologic assessment to ensure comparable levels of impairment among all groups, and from the use of a highly reliable coding system for assessing its central construct, some limitations of the study need to be borne in mind. Specifically, some participants were recruited as part of a larger study whose focus was on relational dynamics in couples in which one member suffered a hearing impairment (R. J. Kelly, 2005). All of the participants in the NC group and all of the participants in the C2 group whose data were collected in Phoenix were part of the larger study. These participants were encouraged to

bring a significant other to the data collection session and completed a standardized questionnaire assessing a broad range of communication problems (Demorest & Erdman, 1987). As stated previously, no significant differences were found between sites on any study variables. However, because all of the participants in the NC group were part of the larger study, it is not possible to ascertain the extent to which participation in that study may have influenced participants' CAS scores.

In addition, this study employed a content analysis of state anxiety rather than the traditional self-report of trait anxiety. However, other standardized measures of situational or state anxiety exist, whose use in future studies could reinforce or refine the more personal assessment of anxiety in confronting the unknown employed in our research.

Furthermore, as with much of the data collected in the field of communication disorders, the number of males was greater than the number of females in each group, reflecting the different base rates for hearing impairment for older men and women. Although the ratio of men to women did not differ across the three groups, the smaller number of women in the study made it infeasible to evaluate whether the experience of cognitive anxiety is different for the two genders. It is possible that men and women may experience communication situations differently and relate differently to issues of stigma implicit in their identity-defining "core role" constructs. Further studies are needed to more carefully evaluate possible such gender effects.

Implications

Our results suggest that cognitive anxiety may serve a valuable function for people with hearing impairments, representing one of the factors that motivate them to seek services. Understanding a person's level of anxious uncertainty in confronting unpredictable communication situations may help clinicians grasp the individual's readiness for the consultation process. Clinicians may be watchful for signs of cognitive anxiety, such as those exemplified in Figure 2, as these may indicate that an individual is truly prepared for consultation, in the sense of being open to intervention to restore a greater sense of security regarding the conversational world. Closely listening for signs of cognitive anxiety

in such consultation contexts may prove helpful, particularly in more ambiguous situations, such as when a family member or other professional has referred a client for consultation, rather than the client's being prompted by his or her own motivation for change. Presenting the benefits of assistive technologies and communication training as relevant to the specific anxieties of a given client may result in greater adherence to interventions and greater satisfaction with the consultation experience. Conversely, if individuals with hearing problems are not yet ready to take actions to resolve problems associated with their hearing impairments or do not understand how offered assistance relates to their personal concerns, they may not follow up with recommendations to purchase hearing aids or might resist wearing them. Researching those features of their identity that lead them to resist such intervention represents yet another possible contribution of personal construct theory to the psychology of hearing impairment and its rehabilitation.

Despite the high level of cognitive anxiety displayed by the consulting group, it is also possible that the experience of cognitive anxiety could result in avoidance behavior rather than help-seeking. The avoidance may serve to reduce feelings of discomfort by allowing the individual to not engage in situations that are likely to produce anxiety—including the acknowledgment of the need for help implied by professional consultation. The only moderate levels of cognitive anxiety evidenced by our nonconsulting group suggest that this conjunction of discomfort and avoidant coping did not characterize this cohort as a whole. Nonetheless, it is worth assessing in future research whether it might characterize a significant subgroup of those who resist intervention and those for whom anxiety-alleviating efforts (such as public awareness campaigns) might prove helpful in reducing their resistance to services.

Finally, although the participants in this study who had received intervention demonstrated the lowest cognitive anxiety with respect to hearing impairment, they may also confront novel social situations and perhaps experience self-consciousness in their new role as hearing aid wearers. Future research therefore could focus on the experience of cognitive anxiety over the course of adaptation to their assistive technology and the changed life it makes possible.

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