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Preferred level of categorization as strategy to manage chronic illness-related identity among individuals with type 1 versus type 2 diabetes

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Abstract

The present investigation examined social identification management among individuals affected by chronic illness. Because diabetes is a chronic medical condition that consists of a broad superordinate group with two nested subgroups of differing relative status (type 1 versus type 2), it is well-suited to an examination of positive identity management strategies used by individuals with chronic illness. A cross-sectional survey was conducted on individuals with diabetes (N = 399) to assess diabetes-related identity. Results indicated that individuals with type 1 diabetes reported greater identity centrality and greater preference for subgroup self-categorization (“individual affected by type 1 diabetes”) over superordinate group categorization (“individual affected by diabetes”) than did individuals with type 2 diabetes. The relationship between diabetes type and preferred categorization level was moderated by perceived intractability of their condition and perceived stigmatization of the lower status subgroup (i.e., type 2), suggesting that categorization level functions to maintain a positive self-concept. Further, categorization level moderated the negative relationship between identity centrality and feelings of depression and anger, suggesting that self-categorization might function to protect against self-concept threat. The present findings highlight the roles of group status, group boundary permeability, and perceived stigma on identity management strategies used by individuals with a chronic illness.

Keywords

social identity; self-concept; self-categorization; stigma; diabetes; illness

Social identity theory (Tajfel & Turner, 1979) posits that one’s identity consists of the self as both an individual (with particular traits, goals, and experiences), as well as a member of specific social groups (e.g., women, Democrats, academics). Just as feelings of worth are influenced by one’s individual characteristics, behavior, or reputation, feelings of worth can

also be influenced by the characteristics, behavior, or reputation of the groups to which one belongs. Accordingly, individuals are motivated to belong to groups that provide positive value, to perceive their important social groups in a favorable light, and to distance themselves from groups in which membership would reflect negatively upon the self-concept (Tesser, 1986). Social identity theory has traditionally been used to understand intergroup relations (e.g., discrimination); however, recent work has found that the principles derived from social identity theory provide a useful framework for understanding the development of the self-concept and adaptive psychological functioning more generally (Jetten et al., 2017).

Identification as a member of social groups can facilitate health and well-being across a variety of settings (e.g., Haslam et al., 2009); however, little work has systematically examined the factors that influence how individuals with serious, chronic health conditions manage their illness-related identity. When an individual is diagnosed with a chronic illness, the individual is often marked or distinguished as different and set apart from his/her community (Goffman, 1963). As a result, individuals diagnosed with chronic illnesses might have difficulty connecting with similar others unless they deliberately seek them out (Ohman, Soderberg, & Lundman, 2003). Additionally, individuals with a chronic illness often report illness-related stigmatization by others (Chapple, Ziebland, & McPherson, 2004). Unlike most other social groups, the defining characteristic, having a chronic illness, is almost always considered to be undesirable. Accordingly, social identification processes used by individuals affected by chronic illness might differ from those used by members of other social groups (e.g., ethnic groups, university affiliation). The present investigation examined how individuals affected by diabetes represent and manage their chronic illness-related identity.

Diabetes and stigma

Diabetes is a chronic disease that occurs when a person's body does not adequately produce or regulate insulin, which can lead to a host of serious health consequences such as heart disease, nerve damage, kidney disease, or blindness (NDDG, 1979). Although people who do not have diabetes tend to perceive diabetes as a non-stigmatized condition (Schabert, Browne, Mosely, & Speight, 2013), diabetes-related stigma is widely reported among those who have been diagnosed with the condition (Liu et al., 2017). Accordingly, diabetes-related identity presents a devalued social identity for affected individuals.

Diabetes is not a singular disease, but is rather an umbrella term that encompasses two broad types (type 1 and type 2) that differ in physical manifestations, etiology, and management. Whereas behaviors that might reduce the likelihood of an individual developing type 1 diabetes (T1D) have yet to be identified (Gillespie, 2006), research suggests that the likelihood of developing and maintaining type 2 diabetes (T2D) can be substantially reduced through lifestyle changes (i.e., diet, exercise, Tuomilehto et al., 2001). These differences in disease etiology and management are reflected in perceptions of diabetes-related stigma. Research indicates that perceived responsibility for one's own condition results in greater social rejection (Crandall & Moriarty, 1995), and such rejection is considered to be more legitimate than rejection of those who were less responsible for their condition (Rodin,

Price, Sanchez, & McElligott, 1989; Weiner, 1993). Consistent with this work, individuals with T2D indicate that their feelings of stigmatization stem from being blamed by others for causing their own condition (Browne et al., 2013). Individuals with T1D, on the other hand, report that much of the stigmatization they experience is the result of misplaced negative judgment of T2D (Browne et al., 2014). Thus, although both individuals with T1D and T2D report group-based stigma (Liu et al., 2017), there exists a perceived relative status difference between the two subgroups, with T1D having relatively higher status than T2D due to beliefs about responsibility of disease onset. The present investigation examined how relative subgroup status (T1D versus T2D) relates to how individuals represent and manage their illness-related identity.

Social identity management

Because people strive for a positive self-concept, individuals engage in a variety of identity management strategies when confronted with a negative or devalued social identity (Blanz, Mummendey, Mielke, & Klink, 1998; Ellemers, 1993). Identity management strategies are selected based on intergroup factors such as group boundary permeability, group status legitimacy, and the stability of the ingroup's position relative to outgroups (Ellemers, van Knippenberg, & Wilke, 1990). For example, if group boundaries are permeable, individual members of a lower status group may try to dissociate from their devalued group either cognitively (i.e., group membership is not a central aspect of the members' self-definitions) or physically (i.e., seek to leave lower status group).

However, if group boundaries are *not* permeable, such individual mobility strategies are not possible. In this case, group members may engage in social creativity strategies to maintain a positive social identity (Tajfel, 1978). Social creativity strategies are indirect methods of managing negative evaluations related to one's social identity. One method of social creativity that might be particularly useful for individuals affected by diabetes is to reconsider their preferred level of self-categorization within the group. Research indicates that when an individual belongs to a devalued social group that consists of both a superordinate category and nested subgroups of differing relative status, the individual shifts their preferred level of self-categorization within the group (superordinate or subgroup level) to fit with the category that confers a more positive social identity to the individual (Hornsey & Hogg, 2002).

Because diabetes is a chronic illness that consists of both a superordinate group (individuals affected by diabetes) as well as nested subgroups of differing relative status (T1D versus T2D), diabetes-identity allows for a systematic investigation into how preferred level of self-categorization functions as an identity management strategy for individuals affected by chronic illness. In accordance with research on self-categorization, we would expect that individuals diagnosed with T1D would be more likely to show a preference for subgroup self-categorization (i.e., individual affected by T1D) to superordinate group (individual affected by diabetes) than would individuals with T2D, as the subgroup status confers a more positive social identity for those with T1D than it does for individuals with T2D. Moreover, we would expect this pattern to be more pronounced to the degree that a shift in self-categorization functions as an identity enhancement strategy (Hornsey & Hogg, 2002).

Below we outline three potential moderators of the hypothesized relationship between diabetes type and preferred level of categorization based on classic theories of social identity management.

Potential moderators.

As mentioned above, social creativity strategies are most effective for positive identity management when individual mobility strategies are not possible (Tajfel & Turner, 1979). When group boundaries are perceived to be permeable, individuals are less likely to use social creativity strategies (Jackson, Sullivan, Harnish, & Hodge, 1996), and instead, pursue avenues of individual mobility, for example, an individual may exit or psychology dissociate from a lower status group if admission to the higher status group is perceived to be possible. Diabetes diagnoses differ in the extent to which they are perceived to be stable and permanent. T2D diagnoses, in particular, are often discussed in relation to one's modifiable lifestyle behavior (e.g., diet, physical activity; Tuomilehto et al., 2001) whereas T1D are not. Beyond this, individuals also vary in personal perceptions of preventability and stability of their own diabetes diagnosis (Smith et al., 1999). Thus, we would expect the relationship between diabetes type and preferred level of categorization to be more pronounced for individuals who perceive that their diabetes was unavoidable as compared to those who perceive their diabetes was preventable and thus open to change.

The second moderator relates to Hornsey and Hogg's (2002) argument that level of self-categorization functions to maintain a positive social identity. Here, we would expect the relationship between diabetes type and preferred self-categorization level to be more pronounced for individuals who perceive that the lower status subgroup (i.e., T2D) carries more stigma. As such, individuals with T1D would distance themselves from the stigmatized group by embracing the relatively higher status subgroup identity, whereas those with T2D would be expected to embrace the superordinate identity "diabetes". Although we did not have firm predictions about the role of perceived stigmatization of the higher status subgroup (T1D), we examined whether perceptions of stigmatization of individuals with T1D would also moderate the relationships between subgroup status and self-categorization. Here, it seems likely that individuals with T1D would be less likely to gravitate toward the subordinate identity when they perceive this identity to be stigmatized as well.

Finally, if preferred level of self-categorizations functions to maintain a positive social identity, we would expect that the relationship between diabetes type and preferred level of self-categorization to be more pronounced among those for whom diabetes is more central to their identity as these individuals would confer greater benefits from strategically shifting preferred level of categorization. If a devalued identity is not considered central to the self-concept, engaging in social creativity strategies would be less relevant for maintaining a positive social identity (Jackson et al., 1996).

Relationship with depression and anger.

This investigation also examined the potential protective function of identity management strategies. Social identification processes have been shown to buffer against stress and negative experiences that result from being a member of a devalued group (e.g., Branscombe

et al., 1999; Haslam & Reicher, 2006). For example, social identification strategies can reduce stress-induced cortisol levels (Häusser, Kattenstroth, van Dick, & Mojzisch, 2012) and increase perceptions of available coping resources when confronted with adversity (Leach et al., 2010). Research has not yet examined the potential protective function of preferred level of self-categorization; however, like social identification, preferred level of self-categorization is used as an identity enhancement strategy (Hornsey & Hogg, 2002), and identity enhancement strategies have been shown to reduce the negative effects of threat or stress (Cresswell et al., 2005; Rydell & Boucher, 2010). Thus, we examined whether using preferred level of categorization as a positive identity management strategy would be associated with reduced emotional distress experienced as a result of diabetes. To better situate this study in the existing literature on the buffering effects of social identification, we also assessed whether this relationship would be more pronounced among those for whom diabetes is a central component of their identity. The present investigation focused on depression and anger experienced as a result of diabetes as these emotions have been found to be especially problematic for successful diabetes management (Badescu et al., 2016; Harris, 2003; Kolbasovsky, 2004).

An examination of identification management strategies among individuals with diabetes has both theoretical and practical importance. Theoretically, diabetes identity affords an examination as to how individuals might differentially shift preferred level of categorization based on subgroup status. As this shift has been proposed as a self-enhancement strategy, the present investigation examines whether this categorization shift might occur as a function of perceived condition stability, perceived stigmatization, and identity centrality. Previous research has not yet been able to explore these factors in existing social groups; accordingly, the present investigation is able to leverage the natural context of diabetes to carefully examine the factors associated with self-categorization and identity management.

From a practical perspective, patient outcomes are improved to the extent patients feel their own self-views are consistent with those of their medical providers and the medical community (Ong et al., 1995). Despite the many differences between T1D and T2D, much available public health information does not clearly distinguish between diabetes types (Stefanik-Sidener, 2013). The present investigation can therefore provide valuable insight into how individuals with diabetes prefer to be identified, which can in turn inform practices of the medical community to enhance the quality of patient care. Moreover, results from the present investigation might shed light on the protective functions of identity management among those affected by a range of chronic illness with features similar to diabetes.

Overview of Research

Guided by broad principles derived from the social identity theory, the present investigation examined how individuals affected by chronic illness engaged in identity management strategies. We conducted an online survey of individuals diagnosed with diabetes to assess perceptions of diabetes-related identity centrality and self-categorization preferences as part of a larger project on diabetes beliefs and health (Rose, Costabile, Boland, Cohen, & Persky, in press). As this approach to diabetes identity was novel, we examined how variables typically found to correlate with identity centrality would be associated with diabetes-related

identity measures. Thus, for our first research question (RQ1), we examined how diabetes-related identity centrality correlated with perceived stigmatization, positive views toward ingroup members, and negative views toward outgroup members (Brewer, 1999; Jetten et al., 2001; Mummendy, Klink, & Brown, 2001).

Additionally, we outlined five hypotheses to examine the relationship between diabetes type and identity management strategies. First, in accordance with research on identification and relative group status (Ellemers et al., 1990), we hypothesized that: (H1) individuals diagnosed with T1D (the relatively higher status subgroup) would be more likely to indicate that diabetes is central to their identity than would individuals diagnosed with T2D (lower status subgroup). Additionally, consistent with research on self-categorization level and subgroup status (Hornsey & Hogg, 2002), we hypothesized that: (H2) individuals with T1D would be more likely to prefer a subgroup self-categorization (“someone affected by T1D”) to a superordinate group self-categorization (“someone affected by diabetes”) than would individuals with T2D. Moreover, if self-categorization serves as an identity management strategy, we hypothesized that the relationship between diabetes type and preferred self-categorization level would be moderated by: (H3) perceived intractability of the condition, (H4) perceived stigmatization of the lower status subgroup, and (H5) diabetes identity centrality.

Finally, to examine a potential protective function of identity management strategies, our second research question (RQ2) examined the relationships among diabetes type, diabetes identity centrality, and level of preferred categorization on anger and depression experienced as a result of diabetes. Given the lack of research in this area, we did not have firm predictions for how these variables would relate to emotional distress.

Method

Participants

Participants affected by diabetes were recruited in 2017 through two avenues: Facebook groups for affected individuals and ResearchMatch, a database of clinical research volunteers who previously indicated a diabetes diagnosis. Those who were eligible for the study completed a survey administered via SurveyMonkey and were compensated \$10 for their time. Recruitment materials were distributed until we reached a sample of $N = 200$ for each diabetes type, however, the number of participants surpassed 200 per type due to outstanding recruitment invitations. Eligibility criteria for data inclusion in the current study required that the participant reported receiving a diagnosis of type 1 or type 2 diabetes from a healthcare professional (not gestational diabetes or prediabetes) and confirmed this diagnosis at the conclusion of the study when informed that they would be paid regardless of diabetes status. Data were not examined until data collection and screening were concluded.

The final sample consisted of 399 individuals diagnosed with either type 1 diabetes ($N = 192$, of whom 141 identified as female) or type 2 diabetes ($N = 207$, 145 of whom identified as female). Two participants omitted one or more item(s) on a scale; data from these participants were not used in analyses that included scales with omitted items, but data were included in analyses that did not include those scales. Seventy-two percent of respondents

identified as female, 84% identified as Caucasian, and respondents had a mean age of 47.22 years ($SD = 14.67$, Median = 48).

An examination of the relevant literature investigating the relationships between intergroup status and level of self-categorization revealed a range of small to medium effect sizes (e.g., Hornsey & Hogg, 2002). Using G*Power (Faul et al., 2007) with power $(1-\beta) = .80$ and $\alpha = .05$, two-tailed, for an independent sample t-test, recommended sample size was 128 participants to detect a medium effect ($d = .50$) and 788 participants to detect a smaller effect ($d = .20$). Thus, the power for the present study was adequate at the medium effect size level, but potentially underpowered at the small effect size level.

Procedure

As part of a larger study on diabetes-related identity, participants completed an anonymous, online battery of self-report measures assessing their perceptions, beliefs, and behaviors regarding type 1 and type 2 diabetes. Below we describe the measures related to the objectives of the current manuscript.¹ After completing the online consent form, respondents completed measures in reference to both types of diabetes (in counterbalanced order) including: perceived condition intractability, perceived diabetes-related stigma, and negative evaluation of group members. Participants then completed measures related to their own diabetes experience: emotional distress, identity centrality, and preferred level of categorization.

Measures

Perceived condition intractability.—Participants completed a 2-item measure for each subtype assessing the degree to which they perceive diabetes is intractable (e.g., There is a lot that a person can do to control whether or not they get type 1 diabetes, reverse-scored) from the Illness Perception Questionnaire (IPQ-R, Moss-Morris et al., 2002) on a 5-point scale (1 = *Strongly disagree* to 5 = *Strongly agree*). Participants completed this measure for both subtypes of diabetes; however, the present investigation only examined responses for participants' own subtype. Responses were averaged, $r = .84$.

Perceived diabetes-related stigma.—Participants completed a 3-item measure assessing perceived stigmatization of individuals with each subtype (e.g., People with type 1 diabetes experience stigma based on their condition) on a 7-point scale (1 = *Strongly disagree* to 7 = *Strongly agree*). Responses were averaged for T1D, Cronbach's $\alpha = .87$, and T2D, Cronbach's $\alpha = .87$. Additionally, to examine how perceived stigma correlates with identity measures, we averaged scores on these items by participants' diabetes type to create measures of perceptions of stigmatization of ingroup members and of outgroup members.

Negative evaluations of group members.—Participants completed the Negative Judgment subscale of the Universal Measure of Bias (Latner et al., 2008) to assess negative evaluations of individuals with T1D and T2D. Participants completed a 5-item measure

¹Materials related to this project are provided in supplemental materials. Interested readers will find a list of measures included in the Diabetes Identity, Attribution and Health research project, materials used in this manuscript, and supplemental results.

assessing the degree to which they negatively evaluate individuals affected by each subtype of diabetes (e.g., People with type 1 diabetes tend toward bad behavior) on a 7-point scale (1 = *Strongly disagree* to 7 = *Strongly agree*). Responses were averaged for T1D, Cronbach's $\alpha = .94$ and for T2D, Cronbach's $\alpha = .90$. Additionally, to examine how negative evaluations correlated with identity measures, we averaged scores by participants' diabetes type to create measures of negative evaluations of ingroup members and of outgroup members.

Emotional distress.—Because depression and anger can be particularly problematic for individuals affected by diabetes (Harris, 2003; Kolbasovsky, 2004), participants completed a 3-item measure to indicate the degree to which they feel these emotions as a result of diabetes (e.g., My diabetes makes me feel upset) on a 5-point scale (1 = *Strongly disagree* to 5 = *Strongly agree*), $M = 2.70$, $SD = 1.22$, Cronbach's $\alpha = .88$.

Identity centrality.—Participants completed a 3-item identity centrality measure (Leach et al., 2008) assessing the degree to which they identified as a person affected by diabetes (e.g., “Being a person affected by type 1 diabetes is an important part of my self-image.”) on a 7-point scale (1 = *Strongly disagree* to 7 = *Strongly agree*). Responses on items were averaged, $M = 4.46$, $SD = 1.64$, Cronbach's $\alpha = .84$.

Level of categorization.—Participants completed a 2-item measure assessing the degree to which participants aspired to be categorized at the superordinate or subgroup level (Hornsey & Hogg, 2000; 2002) on a 9-point scale (e.g., 1 = *mainly think of myself as someone affected by type 1 diabetes* to 9 = *mainly think of myself as someone affected by diabetes*). Responses on items were averaged, $M = 3.14$, $SD = 2.53$, $r = .71$.

Results

Bivariate correlations among identity-related measures.

Because the current investigation is the first to apply the principles of social identity theory to diabetes identity, we conducted bivariate correlation analyses among identity-related measures to examine how diabetes-related identity relates to perceived stigma and negative evaluations of group members (RQ1). Consistent with previous work on social identity and intergroup relations (Jetten et al., 2001; Mummendy, Klink, & Brown, 2001), diabetes-related identity centrality was positively correlated with perceived stigmatization of the ingroup and negative evaluations of outgroup members, and was negatively related to negative evaluations of ingroup members, see Table 1.

Correlational analyses also indicated that perceived intractability of condition was negatively associated with identity centrality. This finding is consistent with previous work indicating that individuals psychologically dissociate from lower status groups when group boundaries are perceived to be permeable (Ellemers, van Knippenberg, & Wilke, 1990).

Diabetes type and identity measures.

Before examining our focal hypotheses, we first conducted two repeated-measures analyses of variance (ANOVA) to examine perceived status differences between the two diabetes subgroups. Results indicated that respondents perceived greater stigmatization of T2D ($M =$

4.99, $SD = 1.61$) than of T1D ($M = 4.19$, $SD = 1.65$), $F(1, 397) = 83.63$, $p < .001$, $\eta_p^2 = .17$, and reported more negative evaluations of individuals with T2D ($M = 4.05$, $SD = .92$) than those with T1D ($M = 2.04$, $SD = 1.37$), $F(1, 397) = 700.51$, $p < .001$, $\eta_p^2 = .34$, providing evidence that T2D was perceived to have lower status than T1D among respondents in our sample.

We then conducted a series of one-way ANOVAs to examine whether illness identity measures differed as a function of respondents' diabetes type, see Table 2 for descriptive statistics and difference tests.² As predicted by H1, results indicated that individuals with T1D reported greater identity centrality than did individuals with T2D; and consistent with H2, individuals with T1D reported less preference for superordinate categorization than individuals with T2D.

Moderators of relationship between diabetes type and level of categorization.

For moderation analyses, we used the Process macro (Hayes, 2017), a regression path analysis tool that calculates interactions in moderation models and probes statistically significant interactions by calculating conditional effects at one standard deviation above and below the mean of the moderator. Each moderator was tested in its own analysis. Model 1 was used to examine a single moderator (intractability and identity centrality to test H3 and H5, respectively) and model 2 was used to examine two simultaneous moderators (perceived stigmatization of the two subgroups) to test H4. In each case, diabetes type was specified as the predictor variable, the hypothesized moderators were centered and specified as moderators, and preferred level of categorization was specified as the outcome variable.

Perceived condition intractability.—In H3, we predicted that the relationship between diabetes type and preferred level of categorization would differ as a function of perceived intractability of own subgroup. All variables combined to explain 22.51% variance in level of categorization, $F(3, 394) = 38.16$, $p < .001$, and diabetes type, perceived group intractability, and the interaction term were all significant predictors of level of categorization, see Table 3. Conditional effects calculated at one standard deviation below the mean of perceived intractability indicated no significant effect of diabetes type, $b = .29$, $t(396) = .52$, $p = .602$; however, as predicted effects calculated at one standard deviation above the mean of perceived intractability indicated a significant effect of diabetes type, $b = 4.00$, $t(396) = 7.73$, $p < .001$, see Figure 1.

Perceived stigmatization of subgroups.—In H4, we hypothesized that the relationship between diabetes type and level of categorization would differ as a function of perceived stigmatization of the subgroups. Perceived stigma of T1D and perceived stigma of T2D were specified as simultaneous moderators of preferred level of self-categorization. All

².To test the robustness of relationships reported, ANOVAs and moderation regression analyses were conducted with and without a number of covariates that might relate to diabetes-related identity. Because T1D and T2D have distinct characteristics that might affect diabetes-related identity, we conducted analyses with: a) age of onset, b) participants' body mass index (calculated by researchers based on participant reports of height and weight), and c) participant-reported general health status (1 *excellent* to 5 *poor*) added as covariates to all analyses. Adding these covariates did not statistically change interpretations of results and in fact eliminated 15 participants who did not complete all covariate measures. Consequently, the analyses reported in this manuscript report the results without including covariates. Statistical results with the covariates included are included in supplemental materials.

variables combined to explain 20.80% variance in level of categorization, $F(5, 391) = 20.54$, $p < .001$. Diabetes type, perceptions of T2D stigma, and the interaction term of diabetes type and T2D stigma were the only statistically significant predictors of level of categorization, see Table 3. Both conditional effects calculated at one standard deviation below the mean of perceived T2D stigma and those calculated at one standard deviation above the mean indicated significant effects of diabetes type ($-1SD$: $b = .1.37$, $t(396) = 4.12$, $p < .001$; $+1SD$: $b = 2.95$, $t(396) = 9.15$, $p < .001$), see Figure 2. Together, these results indicate that level of categorization is driven by perceptions of stigmatization experienced by the relatively *lower status* subgroup, but not that of the relatively higher status subgroup.

Identity centrality.—To test H5, we examined whether the relationship between diabetes type and level of categorization would differ as a function of diabetes identity centrality. All variables combined to explain 18.68% variance in level of categorization, $F(3, 393) = 30.85$, $p < .001$. The interaction of diabetes type and identity centrality approached but did not reach significance, see Table 3. Note that the identity centrality measure specified diabetes-subgroup (e.g., T1D), which might have attenuated its moderating effect for those who prefer the superordinate group category. Both conditional effects calculated at one standard deviation below the mean of identity centrality and those calculated at one standard deviation above the mean indicated significant effects of diabetes type ($-1SD$: $b = 1.77$, $t(396) = 5.09$, $p < .001$; $+1SD$: $b = 2.61$, $t(396) = 7.85$, $p < .001$), see Figure 3.

Identity and emotional distress.

To examine potential protective effects of identity centrality and level of self-categorization (RQ2), we examined how these factors combined to predict emotional distress experienced as a result of diabetes. We used process model 3 (Hayes, 2017) to examine two simultaneous moderators and their interactive effects. Diabetes type was specified as the predictor variable, identity centrality (centered) and level of self-categorization (centered) were specified as moderators of the emotional distress. All variables combined to explain 11.07% variance in emotional distress, $F(7, 388) = 6.90$, $p < .001$. Results indicated a statistically significant three-way interaction of diabetes type, identity centrality, and self-categorization, see Table 4 for regression weights and statistical tests. Conditional effects of the interaction of diabetes type by preferred level of categorization calculated at one standard deviation below the mean of identity centrality indicated no significant effect, $b = .22$, $t(396) = .94$, $p = .350$; however, conditional effects calculated at one standard deviation above the mean of identity centrality indicated a significant effect of the interaction, $b = -.43$, $t(396) = -2.32$, $p = .021$, see Figure 4. When identity centrality was high and superordinate categorization preference was low, individuals with T2D reported *more* emotional distress than those with T1D, $b = .46$, $t(396) = 1.98$, $p = .048$. Conversely, when identity centrality was high and superordinate categorization preference was high, individuals with T2D reported *less* emotional distress than those with T1D; however, the magnitude of the effect was not statistically significant, $b = -.33$, $t(396) = -1.21$, $p = .229$. When parsed in a different manner, we find that among those with T1D, when identity centrality is high, degree of higher superordinate categorization is associated with more emotional distress, $b = .11$, $t(396) = 2.06$, $p = .040$; however, when identity centrality is low, categorization is unrelated to emotional distress, $b < -.01$, $t(396) = -0.12$, $p = .985$. Among those with T2D, when

identity centrality is high, degree of higher superordinate categorization is associated with less emotional distress, although this difference is not statistically significant $b = -.05$, $t(396) = -1.17$, $p = .241$; however, when identity centrality is low, degree of higher superordinate categorization is positively related to emotional distress, $b = .09$, $t(396) = 2.08$, $p = .038$. These findings provide preliminary evidence that using preferred level of categorization as a positive identity management strategy might protect against the experience of illness-related emotional distress among individuals for whom diabetes is a central aspect of their identity.

Discussion

The present investigation examined how individuals with a chronic illness engaged in identity management strategies. Because diabetes is a chronic illness consisting of both a superordinate group as well as nested subgroups of differing relative status, an examination of diabetes-related identity allows for a systematic investigation into how level of self-categorization functions to maintain a positive social identity. Results of the present study indicated that individuals affected by type 1 diabetes (T1D; the higher status diabetes subgroup) were more likely than those affected by type 2 diabetes (T2D; the lower status diabetes subgroup) to report that diabetes was a central element of their identity. Those with T1D also preferred to identify with their subgroup (T1D) rather than with the broader “diabetic” label as compared with those with T2D. The relationship between diabetes type and preferred categorization level was more pronounced for individuals who perceived their illness to be more intractable and for individuals who perceived that T2D (the lower status subgroup) is associated with greater stigmatization, or negative evaluations, by others. Additionally, preferred categorization level moderated the negative relationship between identity centrality and disease-related feelings of depression and anger, suggesting that self-categorization might in some ways protect the self-concept from negative consequences of chronic illness.

The present investigation is the first to examine how level of self-categorization might be used as a positive identity maintenance strategy for individuals coping with chronic illness, and as such it adds to a growing body of research that examines the reciprocal relationship between group memberships and social identities and health and well-being (e.g., Jetten et al., 2017). The present work demonstrates how individuals prefer a level of self-categorization that confers a more positive social identity, selecting a subgroup level when one’s subgroup has a higher relative status, and selecting the superordinate level when one’s subgroup is associated with greater stigmatization by others. Perceived stigma among those affected by diabetes is associated with poorer health outcomes, increased psychological distress, and reduced quality of life (e.g., Gredig & Bartelsen-Raemy, 2017; Brazeau et al., 2018). As such, identifying and elucidating effective self-enhancement strategies that might attenuate the negative effects of perceived stigma may be instructive for further efforts to improve well-being among those affected by diabetes.

Social identity and well-being.—Although social identification has often been linked to positive health and psychological outcomes (Haslam et al., 2009), the present results

represent a more complex picture. Correlational analyses indicated that the centrality of one's diabetes-related identity was also associated with greater perceptions of stigmatization, a finding that is consistent with research indicating that ingroup identification might result from perceived stigmatization from others (Jetten et al., 2001). Additionally, the present study found that diabetes-related identity centrality was positively associated with emotional distress experienced as a result of diabetes. Although some work indicates that social identity can buffer against ingroup threats (Branscombe et al., 1999), recent work suggests that this buffering effect might not occur for all group memberships (Cruwys & Gunaseelan, 2016). It is possible that those individuals who suffer most acutely from their condition (via social or health consequences) might also be those who indicate that the illness is central to their identity, and in this case, social identification may not be an effective buffer against emotional or psychological distress.

Results of the present study suggest, however, that social identity and self-categorization processes might combine to buffer against the experience of diabetes-related stress. In the present study, results indicated that among individuals affected by T1D who perceive diabetes to be central to their identity, self-categorization as an "individual with T1D" as opposed to "individual with diabetes" was associated with lower levels of emotional distress. However, preferred level of categorization was not related to emotional distress among individuals with T1D who perceived diabetes to be less central to their identity. Given the cross-sectional nature of the present study, we are unable to draw firm conclusions about causality; however, previous research using experimental methods in other contexts suggests that identity enhancement strategies can buffer against threats (Cresswell et al., 2005; Haslam & Reicher, 2006; Häusser, Kattenstroth, van Dick, & Mojzisch, 2012).

Limitations and Future Directions

The present findings indicate that individuals with T1D were more likely to report that the condition is central to their identities than were individuals with T2D. T1D often has an earlier age of onset and can require more management than T2D (NDDG, 1979), two factors that might increase its centrality to one's identity. Results reported in the supplemental analyses demonstrate that observed effects were maintained even when controlling for age of onset and current health status, however, in general, it is important to note the conditions differ on more variables than merely perceived subgroup status.

Additionally, although analyses indicated that individuals affected by T1D correctly perceived their condition to be more intractable than those with T2D, results also indicated that there exist some individuals with T1D who perceive their condition to be potentially tractable. At first glance, this finding may suggest that some individuals are unaware of the medical reality of their condition. However, it is important to note that items used in the present investigation related to controllability of disease onset, as factors influencing diabetes onset, particularly for T2D, are typically similar to those that affect disease progression (e.g., weight, American Diabetes Association, 2014). Moreover, given the lack of clarity about *specific* causal factors related to T1D onset, the degree to which individuals perceive the condition to be inevitable and thus intractable may vary across respondents. Although perceptions of factors related to diabetes onset and diabetes progression are

positively correlated (Parry, Peel, Douglas, & Lawton, 2006), future work should more carefully examine how beliefs regarding disease onset versus progression differ. For example, there are a number of reasons an individual with T1D might perceive their condition to be impermanent such as poor medical education, motivated reasoning, or faith in advances of medical technology. Future work should more carefully examine perceptions of condition permanence and its relation to social identification and categorization processes.

Additionally, given the methodological constraints of a cross-sectional study, the present investigation was not able to examine directional hypotheses. Future work is needed to more clearly establish the factors that influence how illness-related identity develops and the downstream consequences of such identity. Additionally, future work should examine how social identity and self-categorization influence illness management and self-care behavior, as well as how they influence collective action behaviors such as advocating for better resources and reducing discrimination. Along these lines, future work should examine how illness-related identity relates to receptiveness to information presented by medical providers and whether individuals demonstrate greater compliance with medical interventions described in a manner that fits with their own self-definition. In addition, social support has been shown to be positively related to diabetes self-care and management (Gallant, 2003). Future work should examine how social support relates to social identity and self-categorization, and how these factors combine to influence health and well-being.

It is important to note that the individuals in the current study were recruited via ResearchMatch and Facebook patient groups and their gender, age, and ethnic background do not fully represent the demographics of individuals in the United States who are affected by diabetes (CDC, 2017). In particular, eighty-four percent of the sample identified as non-Hispanic white, and seventy-two percent of the sample identified as women. As such, it is difficult to generalize the current results to all individuals with diabetes. For example, given that men and women regulate emotion differently (McRae et al., 2008), it is possible the role of self-categorization in emotional distress might differ for individuals who do not identify as female. More work is needed to better understand whether the observed processes would operate among individuals from different age groups, race/ethnicities, and genders. Similarly, future research should examine how illness-related social identification processes operate among participants' multiple social identities as having a complex social identity buffers the self-concept against threat to any single identity (Costabile & Austin, 2018).

The present investigation focused exclusively on individuals diagnosed with diabetes. To better understand how devalued identities are represented and managed, future research should extend this work to examine how individuals cope with other chronic illnesses, particularly those with similar nested subtypes of differing status (e.g., lung cancer versus kidney cancer), as well as how individuals cope with other devalued social identities. In addition to other disease contexts, many social groups contain a superordinate category with nested subgroups of differing status, such as undergraduate student majors nested under a single institution, or different ability learners nested under the category of "students with disabilities." The processes uncovered here may likewise apply in these cases. By expanding this work outside of diabetes-related identity, we can better understand how general

intergroup factors, such as perceived stigmatization of outgroups affect one's identification with ingroups, even when those ingroups carry their own stigma.

Concluding Comments

The present investigation examines how individuals with chronic illness represent and maintain their illness-related identity. Our findings suggest that individuals with chronic illness use level of self-categorization as an identity maintenance strategy to enhance the self-concept. A greater understanding of how individuals conceive of their illness-related identities may be useful to enhance the quality of patient care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Diabetes type and perceived group intractability on level of preferred self-categorization. Perceived intractability scores are plotted at -1 *SD* (low) and $+1$ *SD* above (high) the mean.

Figure 2. Diabetes type and perceived type 2 diabetes stigma on level of preferred self-categorization. Perceived T2D stigma scores are plotted at -1 *SD* (low) and $+1$ *SD* above (high) the mean.

Figure 3.

Diabetes type and identity centrality on level of preferred self-categorization. Identity centrality scores are plotted at -1 *SD* (low) and $+1$ *SD* above (high) the mean.

Figure 4.

Diabetes type, identity centrality, and preferred level of self-categorization on depression and anger experienced as a result of diabetes. Identity centrality and preferred level of self-categorization scores are plotted at -1 *SD* (low) and $+1$ *SD* above (high) the mean.

Table 1.

Bivariate correlations among diabetes-related identity measures and subgroup perceptions.

Measures	1	2	3	4	5	6	7
1. Identity centrality	---						
2. Level of self-categorization (9 = superordinate category)	-.06	---					
3. Perceived stigma of own subgroup	.18**	.11*	---				
4. Perceived stigma of other subgroup	.28**	-.22**	.34**	---			
5. Subgroup intractability	.23**	-.33**	.03	.38**	---		
6. Negative judgments of own subgroup	-.17**	.37**	-.00	-.29**	-.67**	---	
7. Negative judgments of other subgroup	.21**	-.20**	.01	.39**	.45**	-.33**	---
8. Emotional distress	.34**	.037	.29**	.20**	-.05	.01	.13*

Note: To afford examination of the relationships among identity measures and perceptions of diabetes subgroups, measures assessing perceptions of individuals with T1D and T2D were recoded for correlational analyses to examine perceptions of respondents' own subgroup versus other subgroup.

* $p < .05$,

** $p < .01$

Table 2.

Diabetes type effects on identity-related measures

Variables	Scale range	T1D <i>M (SD)</i>	T2D <i>M (SD)</i>	<i>F</i>	<i>p</i>	η^2	95% CI	
							LL	UL
1. Identity centrality	1 to 7	4.92 (1.49)	4.02 (1.66)	32.49	<.001	.08	.03	.13
2. Level of self-categorization (9 = superordinate category)	1 to 9	2.04 (1.79)	4.16 (2.69)	84.58	<.001	.18	.11	.24
3. Perceived stigma of T1D	1 to 7	4.65 (1.53)	3.75 (1.65)	31.89	<.001	.07	.03	.12
4. Perceived stigma of T2D	1 to 7	5.26 (1.47)	4.74 (1.69)	10.54	.001	.03	.01	.06
5. Subgroup intractability	1 to 5	4.58 (.84)	2.25 (.87)	737.75	<.001	.65	.60	.69
6. Negative judgments of T1D	1 to 7	1.96 (1.27)	2.12 (1.46)	1.29	.256	.00	.00	.01
7. Negative judgments of T2D	1 to 7	4.10 (.98)	4.00 (.86)	1.19	.276	.00	.00	.01
8. Emotional distress	1 to 5	2.97 (1.09)	2.78 (1.05)	2.99	.085	.01	.00	.03

Table 3.

Regression analyses to test 3 predicted moderators of diabetes type on preferred level of self-categorization

Moderator: Perceived intractability						
Predictor	<i>b</i>	<i>se</i>	<i>t</i>	<i>p</i>	LLCI	ULCI
Constant	.64	.62	1.04	.300	-.57	1.86
Diabetic type	2.14	.38	5.63	<.001	1.39	2.89
Intractability	-2.74	.61	-4.47	<.001	-3.95	-1.54
DT x intract.	1.85	.38	4.87	<.001	1.10	2.60
Moderator: Perceived stigmatization of subgroups						
Predictor	<i>b</i>	<i>se</i>	<i>t</i>	<i>p</i>	LLCI	ULCI
Constant	-.03	.38	-.06	.946	-.77	.72
Diabetic type	2.12	.24	8.93	<.001	1.65	2.59
T1D stigma	.15	.43	.36	.718	-.68	.99
DT x T1D stigma	-.17	.26	-.66	.507	-.68	.34
T2D stigma	-1.11	.43	-2.61	.009	-1.95	-.28
DT x T2D stigma	.85	.26	3.31	.001	.34	1.35
Moderator: Identity centrality						
Predictor	<i>b</i>	<i>se</i>	<i>t</i>	<i>p</i>	LLCI	ULCI
Constant	-.13	.38	-.36	.721	-.89	.62
Diabetic type	2.19	.24	9.14	<.001	1.72	2.66
ID centrality	-.51	.40	-1.28	.200	-1.30	.27
DT x ID centrality	.42	.24	1.72	.086	-.06	.89

Note: DT refers diabetes type coded as 1 = Type 1 diabetes 1, 2 = Type 2 diabetes

Table 4.

Regression analyses to examine relationships among diabetes type, self-categorization, and identity centrality on depression and anger

Predictor	<i>b</i>	<i>se</i>	<i>t</i>	<i>p</i>	LLCI	ULCI
Constant	2.70	.22	12.06	<.001	2.26	3.14
Diabetic type	.03	.14	.19	.851	-.24	.29
Self-categorization	.25	.27	.91	.365	-.29	.77
ID centrality	.29	.22	1.31	.188	-.14	.72
DT x SC	-.10	.15	-.69	.488	-.40	.19
DT x ID centrality	.07	.13	.57	.567	-.18	.33
SC x ID centrality	.47	.26	1.82	.069	-.04	.97
DT x SC x ID cent.	-.32	.15	-2.20	.028	-.61	-.03

Note: DT refers diabetes type coded as 1 = Type 1 diabetes 1, 2 = Type 2 diabetes, SC refers to preferred level of self-categorization