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Multicultural Mastery Scale for Youth: Multidimensional Assessment of Culturally Mediated Coping Strategies

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Abstract

Self-mastery refers to problem-focused coping facilitated through personal agency. Communal mastery describes problem solving through an interwoven social network. This study investigates an adaptation of self- and communal mastery measures for youth. Given the important distinction between family and peers in the lives of youth, these adaptation efforts produced Mastery-Family and Mastery-Friends subscales, along with a Mastery-Self subscale. We tested these measures for psychometric properties and internal structure with 284 12 to 18-year-old predominately Yup'ik Eskimo Alaska Native adolescents from rural, remote communities — a non-Western culturally distinct group hypothesized to display higher levels of collectivism and communal mastery. Results demonstrate a subset of items adapted for youth function satisfactorily, a three-response alternative format provided meaningful information, and the subscale's underlying structure is best described through three distinct first-order factors organized under one higher order mastery factor.

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Keywords

American Indian and Alaska Native; mastery; self-efficacy; communal mastery; coping

Western psychology focuses on the individual and emphasizes the autonomy of the self (Markus & Kitayama, 1991).¹ Through these ideological underpinnings, it has constructed an understanding of stress resilience focused on individual coping. Researchers have developed different conceptualizations of this individual coping process in resilience based upon this definition of coping (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Lazarus and Folkman's (1984) widely used theory of adult stress and coping identified problem-focused and emotion-focused coping strategies as ongoing "cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p.141). Based on this understanding of coping processes, childhood and adolescent theories of coping were developed (Compas, Malcarne, & Fondacaro, 1988; Ebata & Moos, 1991; Lengua & Sandier, 1996), while other conceptualizations instead focused on adolescent coping through primary and secondary control process (McCarty et al., 1999; Rudolph, Denning, & Weisz, 1995; Weisz, 1990), regulation of behavior and emotion (Eisenberg, Fabes, & Guthrie, 1997; Eisenberg, Fabes, Guthrie, & Reiser, 2000; Skinner, 1995; Skinner & Wellborn, 1994), and voluntary or involuntary, engaging or disengaging stress responses (Compas, Connor, Osowiecki, & Welch, 1997; Compas et al., 2001; Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000).

Based on these different theories, researchers have developed scales to measure coping in adolescence (Compas et al., 2001; Dise-Lewis, 1988; Moos, 1993; Patterson & McCubbin, 1987; Sveinbjornsdottir & Thorsteinsson, 2008; Windle & Windle, 1996). These scales are based on different facets of Lazarus and Folkman's (1984) cognitive-transactional model of stress and coping. Examples are the Life Events Coping Inventory (LECI; Dise-Lewis, 1988) measuring aggression, stress recognition, distraction, self-destruction, and endurance; the Coping Inventory for Stressful Situations (CISS, Windle and Windle, 1996), measuring task, emotion, avoidance dimensions of coping; the Adolescent Coping Scale (ACS; Frydenberg & Lewis, 1993), measuring problem-solving, reference to others, and non-productive dimensions of coping; the Responses to Stress Questionnaire (RSQ; Connor-Smith et al., 2000; Fear et al., 2009; Jaser et al., 2005), derived from Compas et al.'s (1997) responses to stress model and measuring adolescent volitional coping efforts and involuntary responses to stress; the Adolescent Coping Orientation for Problem Experiences (A-COPE; Patterson & McCubbin, 1987), derived from McCubbin and Patterson's (1983) Double ABCX model, which measures the behaviors adolescents use to deal with problems; the Coping Scale for Children and Youth (CSC-Y, Brodzinsky, Elias, Steiger, Simon, & Gill, 1992); and the Coping Responses Inventory, Youth Form (CRI-Y; Moos, 1993).

These understandings of coping and resilience are all characterized through notions of personal control and agency, which has emerged as central to Western psychological theory as elaborated through numerous psychological constructs, including internal locus of control (Rotter, 1966), hardiness (Kobasa, 1979), self-efficacy (Bandura, 1997), and mastery (Pearlin, Lieberman, Menaghan, & Mullan, 1981). Accordingly, we define self-mastery using the definition of Pearlin et al. (1981), as a personal sense of control in overcoming life

¹We use the term "Western" in this paper to denote the cultural tradition influencing psychology and psychological theory with origins in Ancient Greece, which later evolved and was transported through Europe to the United States, with its understandings of self and personhood characterized in part by individualism and personal independence (Oyserman, Coon, & Kemmelmeier, 2002).

difficulties, solving problems, and coping with stressful situations, arrived at through personal achievement and effort.

In contrast, recent developments in indigenous psychologies have pointed to an alternative understanding of the self that is represented within many nonwestern cultures, characterized by a collective focus. This understanding emphasizes an interconnected or expanded sense of self. It is found in many East Asian cultural frames (Kitamaya, Markus, Matsumoto, & Norsakkunkit, 1997; Markus & Kitamaya, 1991), in developing countries, and in traditional cultures, including Indigenous cultures of North America (Dana, 2000). Various theoretical distinctions elaborate upon this core dissimilarity (Oyserman et al., 2002; Sampson, 1988; Triandis, 1989). This understanding of self has led some investigators to explore a cultural mediation hypothesis for adaptive coping. Whereas self-mastery deals with an individualistic sense of control, one recent elaboration of an alternative coping strategy, communal mastery, emphasizes the belief that one can instead overcome life difficulties, challenges, and stressful circumstances by joining with others in order to tap the resources embedded within close, interwoven social networks (Hobfoll, Jackson, Young, Pierce, & Hobfoll, 2002).

Recently, there is increasing recognition among psychologists that even Western understandings of self are not completely captured by individualistic construals (Guisinger & Blatt, 1994). Within these cultural frames, women are more likely than men to view themselves as interconnected (Cross & Madson, 1997; Gilligan, 1982), and increasingly, a collective sense of agency is being recognized as also operative in stress resilience (Bandura, 2000), leading at least one group to conclude that better understanding of these collective strategies may be crucial to further advances in stress research (Lyons, Michelson, Sullivan, & Coyne, 1998). In response to these discussions, Hobfoll, Schröder, Wells, and Malek (2002) developed a measure of communal mastery, testing it in a series of studies in diverse cultural settings.

Numerous studies have used measures of both self- and communal mastery to examine the relationship of mastery to stress, coping, and behavioral health outcomes. Pearlin et al. (1981) identified self-mastery, coping, and social support as mediating variables for depression resulting from stressful life events such as involuntary job disruption. Hobfoll, Schröder, et al. (2002) examined the relationship between self- and communal mastery with effective coping with stress using a U.S. University undergraduate sample comprised predominately from European ethnic backgrounds. They found that communal mastery was strongly associated with coping through social networks, while self-mastery was more strongly related to individualized coping strategies. Piko (2006) studied communal mastery in a sample of 634 students in Hungary ages 11 to 19 in order to examine the effects of social influences on substance abuse. Adolescent boys with higher levels of communal mastery displayed significantly less smoking and drinking behavior, but this same effect was not found for girls.

Hobfoll, Jackson, et al. (2002) suggested that although self-mastery was a strong and positive predictor for coping with stress in individualistic cultures, communal mastery might be more effective than self-mastery in stress resilience for individuals in collectivist cultures. They investigated the role of communal mastery with Northern Plains American Indian women who were single, between the ages of 16–29, living in rural Montana. They hypothesized this tribal group tended to be collectivist in orientation. These authors found women with high levels of communal mastery were more stress resilient, and in addition, displayed significantly less depressive symptoms and anger than those low in communal mastery. Self-mastery, on the other hand, did not significantly predict stress resilience for

this group. The authors interpreted their findings as suggesting that communal mastery is a more effective strategy in coping with stress for members of collectivist cultures.

Hobfoll, Schröder, et al. (2002) reported that only 13% of the variance between self- and communal mastery was shared in at least one of their samples, interpreting this finding to suggest the two constructs were essentially distinct. Although previous research has studied stress, coping, and resiliency using the self- and communal mastery scales, the research has accordingly treated the two scales as distinct constructs that share limited variance. For the most part, the research upon which this assertion is based appears to have been conducted with U.S. samples composed of research participants from predominately middle class, majority ethnic backgrounds representative of more individualistic orientations. No research to date has empirically tested the underlying structure of the item pool of scales tapping both self- and communal mastery together, using a sample drawn from a culture in which a collectivist orientation may be more representative.

The current study adapts the self- and communal mastery scales for use with adolescents, refining item wording and content to age appropriate levels. There is a crucial need for valid measures of mastery in youth research exploring a wide parameter of topics, including youth resilience, stress and coping, and protection from substance abuse and psychopathology. Such a measure would also have utility in positive psychological assessment with youth. Given the differential importance of peer relations and family relations often found in adolescence (Crosnoe, 2000; Hartup & Stevens, 1997), our scale adaptation efforts produced youth Mastery-Family and Mastery-Friend subscales, which assess through identical item content the extent to which the youth seeks to overcome life difficulties by tapping the resources of family and friends, respectively, along with an adapted youth Mastery-Self subscale. This study explores the adequacy of this adaptation and the structural relations between these subscales using a non-Western, Yup'ik Alaska Native sample living in rural, remote communities, hypothesized as representative of sociocultural orientations more aligned towards collectivism, in contrast to mainstream individualistic orientations in the U.S. Accordingly, an additional aim of this adaptation work was development of mastery scales that are understandable and culturally appropriate to the ethnocultural and ecological context of rural Yup'ik youth. The objectives of this study were to (1) to test the multidimensional nature of mastery as measured by the newly adapted youth Multicultural Mastery Scale (MMS) to a theoretical model of mastery described through a single multidimensional construct composed of three first-order factors, (2) investigate the item characteristics of the item pool for their functioning and for optimal response levels for youth, and (3) assess the evidence for validity of the MMS score interpretations. Specifically, based on theory and the coping literature, we hypothesized that a higher overall level of mastery would be associated with more positive experiences of purpose and meaning in one's life (H1), and with more positive experiences of support from the larger community (H2). We also expected that a higher level of self-focused mastery would be associated with one's identification with a "White American" lifestyle (H3), whereas higher levels of mastery with a communal focus, through family and friends, would be associated with one's identification to an Alaska Native way of life (H4). Although church involvement might contribute to a communal sense of mastery, we expected that mastery levels would not correlate strongly with church importance and attendance (H5), providing evidence for discriminant validity.

Method

Participants

Participants included 284 Alaska Native 12- to 18-year-olds from rural, remote Alaska communities off the road system. These communities are composed of ethnically

homogenous Alaska Native populations sharing similar values and the same cultural background. Approximately two-thirds ($n = 194$) were recruited from a boarding school located in a small city (pop. 8889) in Southeast Alaska serving rural residents living in small (pop. 100–800) communities throughout the state. This boarding school student population was almost entirely Alaska Native, and although the school attracts students from all the cultural and linguistic groups indigenous to Alaska, Yup'ik was the largest cultural group within the student body. The remaining one-third ($n = 90$) attended high school in a predominately Yup'ik regional hub community (pop. 6468) in Southwestern Alaska. This was a slightly more ethnically heterogeneous high school in that approximately 20% of students were non-Native, whereas almost all Alaska Native students were Yup'ik. These students either grew up in this small urban center, or moved there from a smaller community in the region. Boarding school participants were older ($M = 15.9$) than community students ($M = 14.6$; $t(156) = 7.22$; $p < .01$), and at a higher grade level ($M = 10.5$, 8.8; $t(135) = 9.96$; $p < .01$), and the boarding school had a selective admission policy.

The overall sample was 57.7% female and the mean age was 15.5 ($SD = 1.5$) years. There was no significant age difference between males and females. Participants described their parent's marital status as 62% married, 7% single, 19% divorced, and 12% separated. When living at home, 78% of participants reported living with their mothers, 68% living with fathers, 13% living with grandparent(s), and 11% living with another relative. A total of 72% self-identified as members of the Yup'ik Alaska Native cultural linguistic group, followed by Inupiat (21%), Athabaskan (11%), Aleut/Alutiq (6%), and Tlingit/Haida (4%). Some individuals identified with two or more ethnic categories.

Measures

Item pool

Adult Self-Mastery: Pearlin et al. (1981) originally developed the Mastery scale as an adult measure of personal sense of control in overcoming life difficulties. The scale consists of seven items rated on a four-point Likert-type scale, assessing the extent to which individuals perceive themselves as having control over the circumstances that affect their lives. Representative items include “I can do just about anything I really set my mind to,” and “What happens to me in the future mostly depends on me.” Internal consistency reported by Hobfoll, Jackson, et al. (2002) was $\alpha = .72$.

Adult Communal Mastery: The Communal Mastery scale (Jackson, McKenzie, & Hobfoll, 2000) is a 10-item measure itself originally adapted from the Mastery Scale (Pearlin et al., 1981) and the Self-Efficacy Scale (Schwarzer, 1993) to measure coping strategies from a more collectivist orientation. Representative items include “Working together with family and friends I can solve many problems I have,” and “What happens to me in the future depends on my ability to work well with others,” to which individuals respond on a four-point Likert scale. Internal consistency for this scale was $\alpha = .74$ (Hobfoll, Jackson, et al., 2002). We adapted these mastery measures for youth.

Validity measures

Youth Community Support: The Youth Community Support scale is a three-item subscale adapted from the People's Awakening Yup'ik Protective Factors scale for adults (Allen et al., 2006). The Youth Community Support scale taps youth perceptions regarding the presence and extent of support as a protective factors available to young people from the community in general, outside of family and friendship. Representative items include “People support me” and “People are available to me for advice.”

Religious Involvement: Youth's level of involvement with formal religion was assessed through two items. On one item the youth rated the importance of church in their life as *not at all*, *somewhat*, or *really important*, and on a second item, youth rated church attendance through one of five radio buttons, as *less than once a year*, *1–2 times a year*, *1–2 times a month*, *3–4 times a month*, or *at least once a week*.

Alaska Native Cultural Identification: The Alaska Native Cultural Identification scale is an eight-item scale adapted from the item set of the Orthogonal Cultural Identification scale (Oetting & Beauvais, 1990–1991), a method of assessment of bicultural identities among ethnic minority youth. The Alaska Native Cultural Identification scale uses two item stems, worded using descriptors our focus group work found locally understandable: “How much you live by or follow the [Native/White American] way of life?” and “How much do you speak [Native language/English]?” Because cultural behaviors and identification of ethnic youth can differ quite significantly at home with family and older adults from at school with peers (Okazaki & Sue, 1995), we asked these question stems under the headings “When you are at [home/school].” This resulted in two four-item subscales, Alaska Native and White American Identification, named after the item content. These two scales tap elements of identification with the Alaska Native youth's culture of origin, and with non-Native cultures appearing in media and other influences, while at home and at school.

Reasons for Life: The Reasons for Life (RFL) scale is a new 13-item measure that explores beliefs and experiences that contribute to making life enjoyable, worthwhile, and meaningful for youth as protective factors for suicide, and as an intermediate outcome for suicide prevention efforts. The measure was adapted for use with Alaska Native adolescents from Osman et al.'s (1996) Brief Reasons for Living-Adolescent (BRFL-A). However, rather than focusing on reasons why one would not commit suicide if feeling suicidal, as is the case with the BRFL-A, the RFL scale focuses on strengths and positive attributes that are hypothesized as protective from suicide, through assessment of the dimensions of quality of interpersonal relationships, sense of personal efficacy, and cultural and spiritual beliefs that together provide hope and meaning in life. The measure is comprised of four subscales: Others' Assessment of Me, Cultural and Spiritual Beliefs, Personal Efficacy, and Family Responsibility. Higher scores on the RFL are hypothesized to indicate more positive attitudes towards life and higher levels of protective factors from suicide.

Procedures

Scale development procedures for the MMS were a part of a larger research project seeking to develop culturally appropriate measures for testing a model of protection (Allen, Mohatt, Fok, Henry, & Burkett, 2008) and to assess outcomes for intervention research. This was part of the development of a cultural intervention for rural Yup'ik youth to prevent suicide and alcohol abuse (Allen, Mohatt, Fok, Henry, & People Awakening Team, 2009).

Our goal through intensive community engagement was enhanced local community ownership in the intervention development research process.² We developed the MMS through a process of cultural, linguistic, and developmental adaptation of the Mastery (Pearlin et al., 1981) and the Communal Mastery scale (Jackson et al., 2000) for Alaska Native adolescents. The process included successive waves of focus group discussion, item

²Our general approach to measurement development is further described in Mohatt et al. (2004) and Allen et al. (2006). A detailed report (Allen, 2010; available at <http://www.ua.canhr.edu/publications>) provides a more comprehensive step-by-step description of our Community Based Participatory Research (CBPR) procedures for measurement development as used in the current project, along with a detailed analysis of errors, missteps, and successes in our process as it unfolded. This archive of our measurement development process, preserving details of both method and results, affords interested readers an opportunity to explore how these relationships were established and maintained, and how the involvement of these stakeholders contributed to the final adaptations.

development, research team review, item revision, pilot testing, and further item revisions. Our research team included Yup'ik and nonnative researchers, along with Yup'ik cultural consultants (elders, parents, and youth residing in the villages), education faculty with experience in rural Alaska, and external consultants with expertise in the areas of suicide, alcohol, measurement, and intervention research. Adaptation work emphasized preserving the original intent of the items while focusing on developmental, cultural and linguistic appropriateness, understandability, and contextual relevance to rural Alaska Native youth.

Item content was altered using the expertise of our consultants and community co-researchers in response to cultural understandings of each item meaning, often on multiple levels. The first communal mastery item “By joining with friends and family, I have a great deal of control over the things that happen to me” provides an example of the multilevel nature of community stakeholder input that we benefited from, and of how cultural adaptation of an item can involve more than understandability; at times, cross-cultural measurement work can necessitate significant item rewording simply to preserve an item's original meaning across cultures. After multiple revisions, this item was re-written as “Working together with friends and family, I can solve many of my problems.” These changes were in part in response to preference in dialect, speech, and description that reflected a deeper underlying cultural value regarding clarity and economy of expression. However, on a still deeper level, the item confused many of our co-researchers and consultants in its use of the word ‘control.’ Used here in this way, ‘control’ surfaced many complexities regarding cultural worldviews embedded in the item and in particular, cultural assumptions about the nature of personal control. Several people in response noted elders’ teachings about how ‘everything happens for a reason,’ some reasons of which might be entirely unconnected with one’s own actions and behavior. Moreover, Yup'ik cultural values traditionally afford tremendous respect for the autonomy of the individual. The confusion the item created in survey takers appeared related to negative associations with use of word ‘control’ in the item, which several of our cultural consultants noted seemed to infringe on this respect for autonomy. Taken literally, would not ‘control over things that happen to me’ implicate some degree of controlling the actions and behavior of others in one’s environment? As these various questions surfaced in our extended discussions, our work groups concluded one core intent of the scale, and of the Western cultural meaning of control in the item usage, related most centrally to an individual’s sense that things that happen to them will not overwhelm them, that the challenges or “problems” that confront or “happen” to them will not be uncontrollable, or prove beyond their resources. The resulting rewrite that attempted to capture this particular core meaning, “Working together with friends and family, I can solve many of my problems,” was clear and understandable to our co-researchers and cultural consultants, and to youth in focus groups, and this was the item revision we adopted in the item pool for further psychometric testing.

Through focus groups of local community cultural experts and in consultation with our research team it became apparent early in the process that there were important distinctions between family and adolescent peers; thus, next we created two communal mastery item sets (Mastery-Family and Mastery-Friends) that included identical stems, with half referring to problem solving through family, and the other half through friends. The Mastery-Self subscale is an adaptation of the original adult Mastery scale.

In the process of measurement development, we came to understand mastery as a higher order construct with three constituent first-order constructs, and resolved to test the hypothesized structure through a second-order confirmatory factor model, described below. We programmed in an infinite response scale (a “slider”) that allowed us to evaluate multiple possible response formats. Our cultural consultants recommended that the icon be a

detailed graphical image of a salmon with its dorsal fin as a pointer to indicate the individual's response on the scale.

Following almost two years of intensive scale development work, rural co-researchers expressed discomfort with the length of the survey. We negotiated with our co-researchers to use pilot testing to reduce length by identifying best functioning items to retain. Following approval of our community co-researchers, we collected two waves of data in two communities ($n_1 = 54$, $n_2 = 52$). We made final item revisions based on the resulting data. We revised some poorly functioning items prior to the second wave of data collection, at which point we retained the item only if it was functioning satisfactorily. This resulted in three five-item subscales tapping Mastery-Friends, Mastery-Family, and Mastery-Self, totaling 15 items (see Appendix). The resulting set of subscales, the Multicultural Mastery Scale, is designed to measure coping styles associated with sense of efficacy by tapping different strategies that use a self- or communal focus, and that are thought to be culturally mediated.

Participants were recruited through active parental consent procedures. Parents of youth were contacted through their schools, and invited to allow their child to participate in a larger study to help develop measures of the effectiveness of prevention programs designed to enhance youth resistance to alcohol abuse and suicide among rural Alaska Native youth. Youth were offered a payment of \$15 for completing the survey. Following parental consent, youth were informed of the purposes, risks, and benefits of the study, completed a written assent form, and then completed the survey online in small groups, ranging from 2 to 12 individuals. Measures were administered by computer in school computer labs using a secure web server based at the University of Alaska Fairbanks (UAF). The response format included the salmon-shaped pointer described above moving across a horizontal blue background with three semantic anchors placed below. The anchors, at the suggestion of our linguistic advisors, read, '*Not at all*, *Somewhat*,' and '*A lot*.'

The UAF IRB, Yukon Kuskokwim Alaska Native Health Corporation Human Studies Committee, local Tribal Councils, local school boards, and local Alaska Native advisory school boards at each school approved all procedures. Trained research assistants administered these scales as part of larger study on adaptive developmental pathways of Alaska Native youth.

Results

Prior to analysis, we converted the continuous "slider" scale into 20 equal intervals. The 20-point raw item means ranged from 10.32 for item 9 ("I can solve many of the problems I have on my own") to 16.33 for item 6 ("I can do what I set my mind to do because I have the support of my family. Because 20-point response data would not produce meaningful and interpretable item response theory (IRT) option probability curves, we next converted the MMS 20-point data into 5-point scores. This recode of the data also allowed us to produce distributions of subscale scores that approximated a normal distribution. Specifically, we recoded categories 1 to 7 of the 20-point scale into 1, 8 to 11 into 2, 12 to 15 into 3, 16 to 18 into 4, 19 to 20 into 5. We used this 5-point rating scale in analyses related to each objective of the study.

Objective 1: Assessing the Internal Structure of the MMS

Analytic strategy—We used confirmatory factor analysis (CFA) to evaluate the internal structure of the MMS. We first compared three essentially tau-equivalent models of the 15 items in order to test which underlying structure best fit the data (Lee, Dunbar, & Frisbie, 2001). In these models, all item factor loadings are fixed at 1.0, leaving only the error

variances and the correlations among the factors free to vary. This allowed us to construct tests of different factor structures in which only the factor structures differed. We compared a unidimensional model, a first-order three orthogonal factor model, and a second-order three-factor model (see Figure 1). Although the unidimensional model is not suggested by theory, it is the most parsimonious model and therefore must be rejected before a more complex model is retained. In the first-order three orthogonal factor model, each scale taps a separate unique dimension that is uncorrelated with other dimensions. The second-order three-factor model retains this multidimensionality but structures the three first-order factors within a single higher-order factor. The variances of the factors were free in the multidimensional models and the correlations among the factors were fixed to zero in the three orthogonal factor first-order model.

We compared models using likelihood ratio tests and the Bayesian information criterion (BIC) (Bollen, 1980; Guo, Morales, Schwartz, & Szapocznik, 2009). The difference in -2 times the log-likelihood between a full model and a reduced model is distributed as a *chi-square* with degrees of freedom equal to difference in the number of free parameters. According to Raftery (1993), a BIC difference value of 9.2 or greater between two models indicates a significant improvement in fit, favoring the model with the lower BIC. We conducted these CFA analyses using AMOS-16 (Arbuckle, 2006).

The final model was fit to obtain accurate estimates of the factor loadings using the structure that was determined to be optimal in the first set of models. This model had free factor loadings and allowed correlated error terms where theoretically meaningful and required to obtain acceptable model fit (Bollen & Lennox, 1991). We assessed the fit of the final model using four indices, including 1) the *chi-square* to degree of freedom ratio (χ^2/df ; Hatcher, 1994), 2) the comparative fit index (CFI; Bentler, 1990), 3) the goodness-of-fit index (GFI; Bentler & Bonett, 1980), and 4) the root-mean squared error of approximation (RMSEA; Browne & Cudeck, 1993). The literature on covariance structure modeling suggests that a *chi-square/df* ratio of less than 2, a GFI and CFI of 0.95 or higher, and an RMSEA lower than 0.05 are regarded as indications of acceptable model fit.

CFA results—Table 1 reports fit statistics for all models. All model comparisons produced significant results ($p < .001$). The first-order three orthogonal factor model fit better than the unidimensional model, $\Delta\chi^2(2) = 232.8$ and $\Delta\text{BIC} = 221.43$. The second-order three-factor model fit better than either the unidimensional model, $\Delta\chi^2(5) = 306.8$ and $\Delta\text{BIC} = 278.49$, or the first-order three orthogonal factor model, $\Delta\chi^2(3) = 74$, $p < .01$, and $\Delta\text{BIC} = 57.06$. These results suggested that the second-order three-factor model provided the best fit.

Having determined that the second-order model fit best, we reran the CFA, freeing the item loadings. To improve model fit, we allowed correlated pairs of error terms according to the modification indices and only if there were similarities in item content or wording that might produce covariances of the unique variances of the items. As can be seen in Table 1, the fit of the modified second-order model was close to an acceptable fit, $\chi^2(79, N=284) = 177.2$, $\chi^2/df = 2.24$, GFI = .924, CFI = .918, and RMSEA = .066. First- and second-order standardized factor loadings of this model, displayed in Figure 2, were 0.40 or greater, and were also significant except those loadings whose unstandardized loadings were initially constrained to 1. In terms of first-order factor loadings, items 9 and 10 had the smallest loadings, whereas the loadings for items 5 and 6 were the highest. Mastery-Friends had the highest second-order factor loading, 0.75, and was most highly associated with the underlying construct of mastery, whereas the loadings for Mastery-Family and Mastery-Self were 0.50 and 0.57 respectively. The Mastery-Self factor loadings were generally smaller in comparison to those of the other two subscales, except for items 7, 9, and 10. Together,

these results further support that the mastery scale is comprised of three factors that are essentially unidimensional, subsumed through an underlying higher order factor.

Objective 2: Evaluate Item Functioning with Alternative Response Scales

Analytic strategy—We used Samejima's (1996) graded response item response theory (IRT) model to evaluate the response scaling and the functioning of each item on each subscale. Option characteristic curves, or trace lines, were obtained that examined the probability of endorsing a response category at each level of latent trait. The graded response model provides a slope or discrimination parameter for each item as well as location or difficulty parameters (intercepts) for each response on each item. These allow us to evaluate the extent to which the items cover the full range of the latent trait. These IRT analyses were conducted using the *ltm* package through *R* (Rizopoulos, 2006).

IRT results—We followed the procedures in reporting the IRT results from Marshall, Orlando, and Jaycox (2002). Results of the parameter estimates for the 15 items are reported in the “five-category” section of Table 2, which shows the discrimination or slope parameter, represented as “*a*”, and the location parameters (the *b*s for each item). Results indicate that items 3 to 6 provided the best discrimination, whereas items 9 and 10 were the poorest at differentiating individuals or least discriminating. Location parameter values show that aside from items 7 and 9, endorsing a higher option for the remaining 13 items occurred at relatively lower levels of mastery, demonstrating that these items provided more information for individuals with low mastery levels. The location parameter values from *b*₂ to *b*₄ for items 7 and 9 were relatively larger than the other items, indicating that this item was more informative for those with a higher mastery level.

To investigate item information further, we plotted the item information functions for each subscale. These plots are shown in Figure 3. These functions revealed that among all the items, item 6 provided the highest amount of information, especially at low to slightly above-average levels of mastery, whereas items 9 and 10 provided the least information across all levels of mastery. Items 2 to 5 supplied moderate to high information at low to slightly above-average mastery levels, while items 1, 7, 8, and the Mastery-Self items 11–15, provided low to moderate information at similar ranges of mastery levels. Overall, the items appeared to be more informative for individuals at lower range of mastery levels, and that the Mastery-Friends and Mastery-Family items appeared to supply relatively more information than the Mastery-Self items.

Examining the option curves allowed us to evaluate the performance of the five-point rating scale and determine the optimal rating scale. For all 15 items, there was a great amount of overlap between coding categories 2 to 4, suggesting that these three categories might be providing redundant information. Category 4 was almost entirely contained within category 3 for all the items, indicating that little information was provided by having option 4. The large amount of overlap between options 2 and 3 further suggested that participants discriminated through three response categories. Thus, we concluded that three options might be adequate to assess youth responses on this scale.

Recoding the data to three options by collapsing options 2–4, we reran the IRT analysis. Results of the parameter estimates are reported on the “three-category” side of Table 2. For many items, except for items 9 and 11, discrimination indices were slightly higher than for the five-category response set. The *b*₁s were very close in value between the two sets, whereas the *b*₂s for the three-category set were close to the *b*₃s from the five-category calibrations. The similarity is further seen in the option characteristics curves for item 3, displayed in Figure 4.

Despite the similarity of the parameter estimates between the five- and three-category item sets, collapsing across categories might result in information loss, indicated by increased standard errors. To investigate whether this was the case for this sample, the standard error functions for each subscale were compared between the five- and three-category calibrations (see Figure 5). This figure reports that although the standard error was slightly higher for the three-category item set when the mastery level was around -2 to 0.5 , levels of mastery where the items provided most information, the standard error functions between the two coding schemes were generally very close for all three subscales, suggesting that the three-category calibration offers a reasonable fit without significant loss of information for this sample.

Final CFA analyses—As items 9 and 10 provided little information and had low discrimination indices, we dropped these two items from further analyses. We next reran the CFA analysis on the 13-item set using the 5-category coding, resulting in an acceptable fit, $\chi^2(55, N=284)=94.5$, $\chi^2/df=1.72$, GFI=.951, CFI=.960, and RMSEA=.050. The improvement of fit after dropping the two items was significant, with $\Delta\chi^2(24)=82.7$, $p < .01$, and $\Delta BIC=110.97$. Descriptive statistics and internal consistency coefficients (Cronbach's *alpha*) for the 13-item scale and subscale scores using the 20-, 5-, and 3-category response formats for the 13-item set are reported in Table 3.

Objective 3: Convergent and Discriminant Evidence for Validity of MMS Score Interpretations

Finally, we evaluated evidence for validity of the MMS score inferences by examining the convergence of the 13-item MMS scores with the Reasons for Life, Youth Community Support, Alaska Native Cultural Identification, and White American Cultural Identification scale scores. Evidence of discriminant validity was sought by correlating the measure of Religious Involvement with MMS scores.

As noted above in the introduction, we predicted that higher MMS scale scores would be associated with higher scores on measures of reasons for life (H1) and perceived support from the community (H2). We predicted a more complex relationship for Cultural Identification, based on the emergent literature on culture and mastery. On the MMS subscale level, we expected Mastery-Self subscale scores, tapping individualistically focused mastery strategies, would be positively associated with White American Cultural Identification subscale scores (H3). We predicted the MMS subscale scores with a communal focus, the Mastery-Family and Mastery-Friends, would positively associate with Alaska Native Cultural Identification subscale scores (H4). Finally, as evidence of discriminant validity, we predicted mastery scale scores as operationalized on the MMS would not relate to church importance and attendance as measured by the Religious Involvement scale (H5).

As can be seen in Table 4, and consistent with our predictions, the MMS scale scores correlated positively with the Reasons for Life scores ($r=.51$, $p<.01$) and the Youth Community Support scores ($r=.41$, $p<.01$), thus providing evidence that interpretations of the MMS scores converge with those of similar measures. Also as predicted, at the MMS subscale level, Mastery-Self subscale scores were significantly and positively associated with the White American Cultural Identification subscale scores ($r=.30$, $p<.01$), but significantly, albeit modestly, and negatively related to the Alaska Native Cultural Identification subscale scores ($r=-.18$, $p<.01$). The Mastery-Family subscale scores were significantly, though modestly, and positively correlated with the Alaska Native Cultural Identification subscale scores ($r=.17$, $p<.01$). Counter to our initial predictions, the Mastery-Friends subscale scores had little association with either cultural identification score. The

absence of a significant association between MMS scale scores and Religious Involvement scores ($r=.06$, $p=.28$) provided evidence for discriminant validity.

Discussion

The findings from this study suggest that mastery in youth, as measured by the MMS, is a complex, multidimensional construct. A three-factor, second-order model provided the best fit to the data, with the three factors converging to define a higher order mastery construct. Mastery as measured by the MMS item content includes both elements of a personal sense of control in coping with stress, and elements of a belief that one can overcome stressful circumstances by tapping the resources embedded within social networks, including distinct resources found among family, and among friends.

Because there is often differential importance of family and peer relations in adolescence (Crosnoe, 2000; Hartup & Stevens, 1997), we developed separate subscales for the social networks associated with family, and with friends in our adaptation of a communal mastery item pool for youth. Our best fitting model confirmed this distinction between mastery through family relations, and mastery through friendship relations, as separate dimensions important in youth resilience experience.

Communal mastery has been described in the literature as a construct distinct from self-mastery (Hobfoll, Jackson, et al, 2002; Hobfoll, Schröder et al., 2002) in an effort to differentiate communal mastery from the personal mastery scales prominent in the literature. However, their actual relations as demonstrated in this study appear to be more complex. We explored the MMS item pool with a non-Western indigenous cultural group because we hypothesized that this group would represent a collectivist orientation. Our scale development work with Alaska Native youth did produce a three-factor structure of mastery aligned with self, family, and friends. However, this structure was embedded within a single higher-order factor. This second-order factor model provided a better fit to the data than a three-factor structure. Though each subscale describes a unique dimension of mastery experience, these data suggest that the observed three-factor structure is best understood in this cultural group as facets of a single overarching construct. A question for future research is whether the structure is cross-culturally invariant, in particular when tested with groups more representative of an individualistic orientation.

This more nuanced view suggested by this study, of the structure of self and communal mastery as interrelated, rather than distinct dimensions, is consistent with recent theory emphasizing individual and communal views of self on a continuum across all cultures, rather than a dichotomy (Hobfoll, Schröder et al., 2002). The finding of a single unified mastery construct reflects thinking over the past two decades highlighting within any given culture, individuals will vary in self construals, often in ways different from the culturally normative or even mandated self-representation (Markus & Kitayama, 1991). The MMS offers a way to assess this variation both between individuals and between groups, and to understand how these different dimensions of mastery converge in a potentially additive fashion in diverse areas such youth coping, resilience, and health outcomes. This dimensionalized approach points to the need for future research, for example, on whether these mastery strategies are in fact additive in their effects. It may be Western psychology, through a monocultural understanding of self, has constrained our understanding of coping and resiliency processes.

Evidence for the validity inferences from MMS scores was demonstrated through their association with measures of the experience of purpose and meaning in one's life and the experience of support from the larger community. Associations between subscale scores

provided additional support for theory underlying the communal mastery construct and its assertion that both mastery style as well as what constitutes effective coping is culturally as well as situationally mediated. Personal mastery score was both positively associated with White American cultural identification score and negatively associated with Alaska Native cultural identification score. Family-based communal mastery score was positively associated with Alaska Native cultural identification score. This finding is consistent with observations in our work with the Yup'ik and other rural Alaska Native groups regarding the primacy of family in these close kinship-based cultural settings situated in remote, isolated arctic communities. Consistent with our notion that family and friend mastery should be differentiated for adolescents, mastery through friendship relations was not associated with either Alaska Native or White American cultural identification. This is another area for fruitful research to better understand the differential meaning and significance of family and friendship relationships, particularly in light of the importance of peer relationships for understanding adolescent development in the majority culture (Brown, Dolcini, & Leventhal, 1997; Henry, Tolan, & Gorman-Smith, 2001).

Item response theory analyses indicated that items 9 and 10 had low discrimination indices and provided low information. Therefore, these items were dropped from the final scale. These two are the same item wording stems from the Mastery-Friends and Mastery-Family subscales ("I can get what I want by helping my friends/family get what they want"). Our cultural consultants suggested that the focus of this item content was exclusively on immediate self-gain, and this represented a type of individually focused motivation that was culturally undesirable through its self-centered nature, and culturally inappropriate for Yup'ik youth to endorse.

Item-level analyses also suggested that generally, the 13 MMS items retained in the final scale provide satisfactory discrimination, with the most information supplied among individuals with low to slightly above-average mastery levels. In the current sample, Mastery-Self provided lower information values relative to the other two mastery subscales tapping a communal focus, providing additional support to the cultural mediation hypothesis. We interpret this finding as reflecting the collectivist and communal Alaska Native orientation in coping with stress. This is consistent with the data from Hobfoll, Jackson, et al. (2002), which also suggest collectivist cultures cope with stress in more communal ways, unlike individualistic cultures. We conjecture that when the MMS is administered to youth with more individualistic cultural orientations, the results might be the opposite, with Mastery-Self supplying more information than the communal subscales.

Early in the process of item adaptation, our cultural consultants suggested that three categories would be optimal for Yup'ik youth responding to our questions. Item response theory analyses suggested for this study sample, coding the analog response positions into three response categories yielded optimal results with little information loss. Additional categories to these three appeared to add little additional information. Item-level work also indicated the response style for this group on these items might best be understood as nonlinear. That is, respondents using the infinite slider were less likely to select positions below the midpoint than they were to select positions above the midpoint. A normal curve was approximated only when the segmentation of the analog scale was nonlinear and accelerating. For this sample, model fit and item characteristics appeared to improve when a majority of the analog rating line was coded as 1, a smaller segment to the right of the midpoint 2, and only a small segment of the extreme right of the analog scale was coded 3. This may in part be related to the positive and likely socially desirable nature of the mastery items, however, this response style was noted on most all the scales used in the broader study in which the MMS was used, and may instead characterize a culturally mediated response style. We wish to emphasize here the tentative nature of these conclusions

regarding calibration. Our findings suggest that the five-category response format provided little in the way of additional measurement precision. More conclusive statements await replication of these findings on the distribution of item responses in order to determine if a three-category response format, which places less burden upon respondents than five categories, results in no appreciable loss of information. In addition, research on the MMS is needed with other cultural groups and in other settings, to examine the saturation of the mastery construct with socially desirable responding (Paulhus, 1991).

The current findings call for more intensive discovery based and exploratory research into alternative mastery styles across diverse cultural settings. These data clearly substantiate the existence of different dimensions of mastery strategies and experience that vary across individuals and that appear to be in part, as suggested by the observed relations with the cultural identification scales, culturally mediated. The findings also demonstrate that different mastery styles can be effectively measured, and that these different dimensions appear to contribute to a single mastery construct that is broader than the boundaries of personal mastery alone. Even though there was evidence of convergence with the measure of community support, the results of this study are not inconsistent with evidence that the communal mastery concept is distinct from social support.

These findings of a multidimensional structure in mastery through the measurement properties of the MMS should not be interpreted as leading to conclusions that the MMS exhaustively taps all possible cultural variants associated with mastery. This assertion is unwarranted, and the current findings instead serve as a call for more intensive discovery based and exploratory research into other alternative mastery styles across diverse cultural settings. The current data clearly substantiate the existence of different dimensions of mastery strategies and experiences that vary across individuals and appear to be in part, culturally mediated. The findings also demonstrate that different mastery styles can be effectively measured, and that these different dimensions appear to contribute to a single mastery construct that is broader than the boundaries of personal mastery alone.

In this study, mastery was moderately correlated with perceptions of community support; however, it was also uncorrelated with a measure of religious involvement. Involvement in formal religious institutions undoubtedly includes elements in addition to social support alone, nonetheless these findings are complex with regard to the distinction of communal mastery from social support. The MMS communal mastery questions ask the degree to which ability to cope with problems is tied to resources embedded in social networks, and not perceptions of support available. Hobfoll, Schroder, et al. (2002), in their work with communal mastery, found the impact of communal mastery on indices of effective coping was independent of measured social support. The degree to which mastery, and the communal mastery concept in particular is distinct from that of social support requires further research.

A limitation of this study is that a more convincing validity argument for MMS score interpretations would examine its relationships with established instruments that assess similar constructs. However, the current state of assessment research is there are limited instruments with established psychometric properties with Alaska Native people. The scales we used were measures of the most closely aligned constructs to the MMS from all measures that we are aware with established psychometric properties for use with Alaska Native youth. An examination of associations of the MMS with measures of reasons for life and community support is less clear as a validity argument, even though there exist strong linkages to theory predicting the relationships between variables that we in fact observed. At this point in the literature, we made the principled decision to use instruments with established psychometric qualities tapping constructs for which theory predicts

relationships, over measures that assess more highly similar constructs using measures with unsubstantiated operating characteristics with Alaska Native people.

Another important approach to studying the concept of mastery involves a “bottom-up,” situational-contextual approach, based in Coyne and Racciopo (2000) critique of the Lazarus and Folkman (1984) coping model. This critique is rooted in the observation that the perception of mastery can vary depending on situational and performance domains. The notion that concepts such as mastery depend, at least in part, on the situation is unassailable. Nonetheless, this work has produced a measure with strong psychometric properties and evidence of construct validity. The assumption behind our work here is that behavior can be viewed as the interactive outcome of factors in both the person and the situation. Our work in developing the MMS is meant to encourage further investigation of mastery, including investigation of situation specificity through a bottom-up strategy. Indeed, we are engaged in just such a bottom-up approach in a companion, ongoing qualitative exploration of cultural-contextual strategies of coping and resilience among Yup'ik youth and youth from four other international indigenous circumpolar groups. We believe that both these top-down and bottom-up approaches have informed our understanding of mastery in unique and complementary ways.

In summary, the MMS provides a multidimensional assessment for youth of personal mastery and two variations of communal mastery, characterized by use of the resources embedded in family and in friendship relationships. The structure of mastery as measured by the MMS is best understood as three separate first-order factors subsumed under a single higher order overall mastery factor. In addition to Alaska Native populations, the MMS may also be suitable for the assessment of these three mastery styles with American Indian groups, and with individuals from other nonwestern cultural groups that may also be more representative of collectivist orientations, such as East and South Asian culture groups. Finally, the MMS shows promise within the at present neglected area of assessment of within group differences in mastery style preferences among individuals from Western cultural backgrounds, with the potential to provide better understanding of these collective strategies in all cultural groups, a development which may prove crucial to further advances in stress research.

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Appendix Multicultural Mastery Scale

Mastery-Friends

1. Working together with friends I can solve many of my problems.
3. I can change many of the important things in my life with the help of my friends.
5. I can do what I set my mind to do because I have the support of my friends.
7. What happens to me in the future mostly depends on my being supported by friends.
- 9*. I can get what I want by helping my friends get what they want.

Mastery-Family

2. Working together with family I can solve many of my problems.
4. I can change many of the important things in my life with the help of my family.
6. I can do what I set my mind to do because I have the support of my family.
8. What happens to me in the future mostly depends on my being supported by family.
- 10*. I can get what I want by helping my family get what they want

Mastery-Self

11. I can solve many of the problems I have on my own
12. I can change many of the important things in my life
13. I do well even when things are tough.
14. What happens to me mostly depends on me.
15. I can do just about anything I really set my mind to do.

* Note. Items 9 and 10 were dropped for the final 13-item set

Unidimensional model

First-order three orthogonal factor model

Second-order three-factor model

Figure 1. Confirmatory factor analyses comparison between the unidimensional, first-order three orthogonal factor, and second-order three-factor models.

Chi-square=177.2, df=79

GFI=.924

CFI=.918

RMSEA=.066

**
 $p < .01$

Figure 2.

Modified second-order three-factor confirmatory factor analysis model. Eight pairs of observed variables' unique variances were allowed to correlate in this model.

Mastery-Friends

Mastery-Family

Mastery-Self

Figure 3.
Item information functions by subscale from the five-category calibration.

Five-category calibration

Three-category calibration

Figure 4.
Comparison of trace lines for the five- and three-category calibrations for Item 3.

Mastery-Friends

Mastery-Family

Mastery-Self

Figure 5.

Standard error functions by subscale comparing the five-category and three-category calibrations.

Model Fit Indexes for the Unidimensional, First-Order Three Orthogonal Factor, Second-Order Three-Factor, and Other Modified Models.

Table 1

Model	Number of items	χ^2 (df)	χ^2/df	BIC	GFI	CFI	RMSEA
Unidimensional	15	768.1(104)	7.39	858.45	.708	.448	.150
First-Order Three Orthogonal Factor	15	535.3(102)	5.25	637.02	.781	.640	.123
Second-Order Three-Factor	15	461.3(99)	4.66	579.96	.807	.699	.114
Modified Second-Order Three-Factor	15	177.2(79)	2.24	408.82	.924	.918	.066
Modified Second-Order Three-Factor	13	94.5(55)	1.72	297.85	.951	.960	.050

Note. CFA = confirmatory factor analysis; BIC = Bayesian information criteria; GFI = graduated fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation; 8 pairs of observed variables' unique variances were allowed to correlate in the 15-item modified second-order three-factor model: (a) Items 1 and 2, (b) items 3 and 4, (c) items 5 and 6, (d) items 7 and 8, (e) items 9 and 10, (f) items 5 and 13, (g) items 6 and 13, and (h) items 7 and 12.

Table 2

Item Parameters for Five- and Three-Category Calibrations

Item	Five-category calibration				Three-category calibration			
	a	b ₁	b ₂	b ₃	b ₄	a	b ₁	b ₂
Mastery-Friends								
1	1.53	-2.43	-0.92	0.26	0.75	1.64	-2.33	0.72
3	2.02	-1.52	-0.54	0.41	0.85	2.24	-1.46	0.83
5	2.14	-2.00	-1.10	0.02	0.39	2.27	-1.96	0.36
7	1.17	-1.15	0.33	1.55	2.11	1.22	-1.12	2.05
9	0.89	-1.02	0.68	2.17	2.89	0.84	-1.07	3.02
Mastery-Family								
2	1.81	-1.73	-0.72	0.13	0.67	2.00	-1.65	0.66
4	2.02	-1.98	-1.07	-0.19	0.20	2.06	-1.97	0.20
6	2.88	-1.90	-1.13	-0.31	0.04	3.01	-1.88	0.04
8	1.71	-1.85	-0.93	0.04	0.50	1.72	-1.85	0.49
10	0.89	-2.55	-0.70	0.74	1.42	1.06	-2.25	1.26
Mastery-Self								
11	1.57	-1.38	-0.35	0.69	1.25	1.49	-1.43	1.30
12	1.32	-1.81	-0.55	0.47	0.89	1.33	-1.79	0.87
13	1.26	-1.82	-0.64	0.77	1.52	1.30	-1.79	1.49
14	1.42	-2.21	-0.75	0.04	0.61	1.61	-2.08	0.56
15	1.63	-2.68	-1.11	-0.12	0.33	1.71	-2.59	0.31

Table 3

Descriptive Statistics of the final 13-item MMS Scores

	n	<u>20-category calibration</u>		<u>5-category calibration</u>		<u>3-category calibration</u>	
		<i>M(SD)</i>	<i>α</i>	<i>M(SD)</i>	<i>α</i>	<i>M(SD)</i>	<i>α</i>
MMS	13	187.63(32.85)	.77	43.30(8.99)	.78	28.66(3.95)	.76
Mastery-Friends	4	55.28(13.96)	.70	12.63(3.79)	.72	8.56(1.68)	.69
Mastery-Family	4	61.45(14.80)	.77	14.40(4.08)	.77	9.25(1.85)	.76
Mastery-Self	5	70.90(17.37)	.72	16.26(4.57)	.71	10.86(1.97)	.68

Note. MMS=Multicultural Mastery Scale; n=Number of items.

Table 4

Correlation among the MMS Scale, Subscales, and Validity Measures

	1	2	3	4	5	6	7	8
1. MMS								
2. Mastery-Friends	.74**							
3. Mastery-Family	.76**	.36**						
4. Mastery-Self	.65**	.24**	.22**					
5. Reasons for Life	.51**	.34**	.55**	.20**				
6. Youth Community Support	.41**	.34**	.38**	.14*	.45**			
7. Alaska Native Cultural Identification	.04	.07	.17**	-.18**	.30**	.18**		
8. White American Cultural Identification	.15**	.11	-.05	.30**	-.09	-.02	-.43**	
9. Religious Involvement	.06	.01	.21**	-.11	.43**	.17**	.34**	-.24**

* p<.05

** p<.01

Note. MMS = Multicultural Mastery Scale