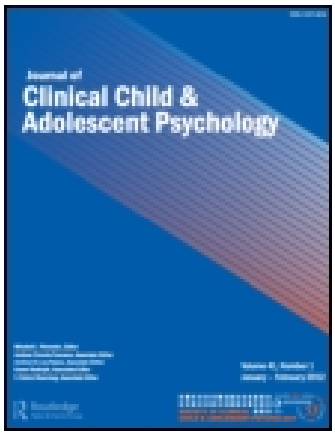
This article was downloaded by: [Arizona State University]
On: 04 March 2015, At: 08:43
Publisher: Routledge
Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



CrossMark
Click for updates

Journal of Clinical Child & Adolescent Psychology
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/hcap20

A Personalized and Control Systems Engineering Conceptual Approach to Target Childhood Anxiety in the Contexts of Cultural Diversity

Armando A. Pina [a], Lindsay E. Holly [a], Argero A. Zerr [b] & Daniel E. Rivera [c]
[a] Prevention Research Center, Department of Psychology, Arizona State University
[b] Child and Family Center, University of Oregon
[c] Control Systems Engineering Laboratory, School for Engineering of Matter, Transport, and Energy, Arizona State University
Published online: 04 Apr 2014.

To cite this article: Armando A. Pina, Lindsay E. Holly, Argero A. Zerr & Daniel E. Rivera (2014) A Personalized and Control Systems Engineering Conceptual Approach to Target Childhood Anxiety in the Contexts of Cultural Diversity, Journal of Clinical Child & Adolescent Psychology, 43:3, 442-453, DOI: 10.1080/15374416.2014.888667

To link to this article: http://dx.doi.org/10.1080/15374416.2014.888667

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at http://www.tandfonline.com/page/terms-and-conditions

Journal of Clinical Child & Adolescent Psychology, 43(3), 442–453, 2014
Copyright © Taylor & Francis Group, LLC
ISSN: 1537-4416 print/1537-4424 online
DOI: 10.1080/15374416.2014.888667

Routledge
Taylor & Francis Group

A Personalized and Control Systems Engineering Conceptual Approach to Target Childhood Anxiety in the Contexts of Cultural Diversity

Armando A. Pina and Lindsay E. Holly
Prevention Research Center, Department of Psychology, Arizona State University

Argero A. Zerr
Child and Family Center, University of Oregon

Daniel E. Rivera
Control Systems Engineering Laboratory, School for Engineering of Matter, Transport, and Energy, Arizona State University

Downloaded by [Arizona State University] at 08:43 04 March 2015

In the child and adolescent anxiety area, some progress has been made to develop evidence-based prevention protocols, but less is known about how to best target these problems in children and families of color. In general, data show differential program effects with some minority children benefiting significantly less. Our preliminary data, however, show promise and suggest cultural parameters to consider in the tailoring process beyond language and cultural symbols. It appears that a more focused approach to culture might help activate intervention components and its intended effects by focusing, for example, on the various facets of *familismo* when working with some Mexican parents. However, testing the effects and nuances of cultural adaption vis-à-vis a focused personalized approach is methodologically challenging. For this reason, we identify control systems engineering design methods and provide example scenarios relevant to our data and recent intervention work.

Anxiety disorders are not only among the most prevalent psychiatric disorders in children and adolescents (Costello, Egger, & Angold, 2005; Kessler, Ruscio, Shear, & Wittchen, 2009), they also are typically chronic and lead to significant impairment, including poor academic performance; depression; and early initiation of the use of alcohol, tobacco, and other illicit drugs[1] (Conger & Rueter, 1996; Glantz & Leshner, 2000). Although this constellation of negative outcomes has prompted much interest in developing evidence-based treatments for clinically anxious children (Hourigan, Settipani, Southam-Gerow, & Kendall, 2012), additional efforts are needed to more effectively reduce the incidence of childhood anxiety disorders. Of note are data indicating that most parents do not seek treatment for clinically anxious youth (Barrett & Turner, 2004; Chavira, Stein, Bailey, & Stein, 2004). And for those who do receive anxiety treatment, diagnostic recovery rates average 60%, which means that treatments fail about 40% of youth (Silverman, Pina, & Viswesvaran, 2008). Furthermore, across long-term follow-ups, the efficacy of childhood anxiety treatments typically decreases by 10% (Silverman et al., 2008). For these reasons, in addition to developing innovative treatments, preventing anxiety disorders may be both an effective and efficient

[1]There is some research showing that high anxiety sometimes delays the onset of smoking and is occasionally linked to lower levels of alcohol use disorder symptoms in young adulthood (Costello, Erkanli, Federman, & Angold, 1999; Pardini, White, & Stouthamer-Loeber, 2007; Wu et al., 2010).

Correspondence should be addressed to Armando A. Pina, Prevention Research Center, Department of Psychology, Arizona State University, P.O. Box 871104, Tempe, AZ 85287. E-mail: Armando.Pina@asu.edu

Downloaded by [Arizona State University] at 08:43 04 March 2015

way to reduce the incidence of this psychiatric condition and its associated impairment.

In the clinical child and adolescent anxiety area, several randomized controlled prevention trials have been published at the universal, selective, and indicated levels. Briefly, as described by the Institute of Medicine (2009), universal prevention strategies target a full population based on evidence that it is likely beneficial to all recipients by reducing the incidence of disease relative to costs and risks, selective prevention strategies target segments of a population identified as being at elevated risk for a disease or disorder, and indicated prevention strategies target only those who are identified (or individually screened) as having an increased vulnerability for a disorder. When it comes to child anxiety, several trials have been conducted at each of these levels of prevention (e.g., Barrett & Turner, 2001; Dadds, Spence, Holland, Barrett, & Laurens, 1997; Essau, Conradt, Sasagawa, & Ollendick, 2012; Lock & Barrett, 2003; Lowry-Webster, Barrett, & Dadds, 2001; Mifsud & Rapee, 2005; Simon, Bogels, & Voncken, 2011) with most efforts guided by a cognitive-behavioral model of child psychotherapy (Kendall, 1985, 2000; Kendall, Panichelli-Mindel, Sugarman, & Callahan, 1997). This psychotherapy (and prevention) model generally emphasizes psychoeducation (or anxiety emotion understanding), relaxation (breathing, muscle), cognitive self-control, social skills training, and experiential activities to facilitate skill practice and learning (or exposures). Thus, treatment and prevention efforts targeting child anxiety disorders are more similar than different (see Fisak, Richard, & Mann, 2011; Silverman et al., 2008). Turning to outcomes, data show that clinical levels of child and adolescent anxiety might be preventable, albeit there is a general lack of long-term follow-up studies. Focusing on initial outcomes from prevention studies, program effects are encouraging when defined as (a) not meeting diagnostic criteria for an anxiety disorder (Dadds et al., 1999; Dadds et al., 1997), (b) not being "at risk" for an anxiety disorder [e.g., based on clinical cutoff scores on the Spence Children's Anxiety Scale (SCAS); Lowry-Webster et al., 2001; Lowry-Webster, Barrett, & Lock, 2003], or (c) reductions in anxiety levels (based on rating scales; Barrett & Turner, 2001). It is important to note, however, that using meta-analyses, Fisak et al. (2011) found prevention programs to have a relatively low overall mean weighted effect size ($d = .18$) with a slightly greater effect for targeted (i.e., selective and indicated) protocols ($d = .26$). In another meta-analysis, protocols yielded similarly low effect sizes on anxiety outcomes at posttest (about .22 for symptoms and .23 for diagnoses) and follow-up (about .19 for symptoms and .32 for diagnoses) along with variations in program effects giving targeted programs an advantage over universal programs (.32 vs. .12 at posttest, .23 vs. .15 at follow-up; Teubert & Pinquart, 2011). These relatively low effect sizes need to be interpreted with caution, however, because effects are based on pretest to posttest data and preventive outcomes should be expected over time (not immediately after intervening). Also, most anxiety prevention studies typically lack large enough sample sizes for the proposed analyses and rely on waitlist control comparison conditions, which limit the study's ability to make comparisons over time because eventually all participants receive the intervention.

It also is important to note that there is a scarcity of child anxiety treatment and prevention research with ethnic minority or culturally diverse child populations as well as some data showing that program efforts might need strengthening for this group. More specifically, Huey and Polo (2008) found no well-established treatments for ethnic minority children, and only a handful of anxiety programs were identified in their exhaustive review of the literature. In addition, Huey and Polo concluded that the evidence was equivocal with regard to the need for cultural adaptations (pp. 284 and 289) with meta-analyses highlighting a significant number of major concerns with the current status of the field (some of which also have been noted by others: Benish, Quintana, & Wampold, 2011; Griner & Smith, 2006; Ortiz & Del Vecchio, 2013). Turning to anxiety prevention, data show that some children are benefiting significantly less from prevention efforts (e.g., Barrett, Sonderegger, & Xenos, 2003; Cooley-Strickland, Griffin, Darney, Otte, & Ko, 2011; Miller et al., 2011). In Barrett et al. (2003), 320 immigrant children residing in Australia (6–19 years old; 153 girls; 125 Yugoslavian, 148 Chinese, 47 multiethnic) were randomized to an anxiety prevention program (FRIENDS not culturally tailored; $n = 166$) or waitlist ($n = 154$). At posttest, there were some program gains, but Chinese children in the intervention showed significantly less improvement on self-reported anxiety and self-esteem compared to their immigrant counterparts. As explained, Chinese children appeared to show minimal cultural adjustment to the host culture, whereas their Yugoslavian immigrant counterparts were more similar to their Australian host-peers, a fact that may have facilitated greater uptake and practice of program skills for the latter. In another trial, Cooley-Strickland et al. (2011) randomized 93 ethnic minority children (mostly African American) to the intervention (FRIENDS culturally adapted for inner-city youth; $n = 48$) or a waitlist ($n = 45$). Findings showed no statistically significant program differences compared to waitlist on any of the primary outcome variables, including anxiety symptom levels (not even for those children with higher levels of community violence exposure at baseline). As noted, these null findings were likely related to a lack of a clearly delineated control group and longer follow-up, with the latter possibly allowing more time to practice and develop the anxiety coping skills taught. Similar null

Downloaded by [Arizona State University] at 08:43 04 March 2015

findings were reported by Miller et al. (2011), who randomized 533 children (including many Aboriginal children residing in Canada) to the intervention (FRIENDS culturally adapted; $n = 269$) or a waitlist ($n = 264$). Findings showed that no statistically significant reductions in anxiety levels could be attributed to the intervention. In their discussion, several limitations relevant to the lack of program effects were noted, including the possibility that the large number of cultural enhancements likely reduced emphasis on the assumed core program change components along with a low reporting of program adherence. Across studies, the evidence seems to suggest that anxiety prevention efforts need strengthening to secure greater program effects at the immediate posttest (for targeted programs) and short term follow-up (less is known about long-term effects). Moreover, because anxiety prevention programs remain less promising for children of color, enhancing protocols for ethnically diverse children and families could help secure evidence-based interventions for *all* children.

Focusing on cultural adaptation and children of color, data corresponding to the only two studies published to date focusing on Hispanic/Latino children and families appear somewhat more encouraging. Pina, Silverman, Fuentes, Kurtines, and Weems (2003) reported program response and maintenance findings corresponding to a cognitive-behavioral treatment protocol in a sample of 131 children (40% Hispanic/Latinos most of whom were Cubans from Miami, Florida; 6–16 years of age) who presented with anxiety (generalized anxiety disorder, overanxious disorder, separation anxiety disorder, social anxiety disorder, and specific phobias). The analyses focused on cross-ethnic comparisons along diagnostic recovery rates, parent and child completed measures, and clinically significant change, both in terms of traditional hypothesis testing and equivalence testing. Findings showed statistically significant improvements and maintenance of program effects from pretest, to posttest, to follow-up (3, 6, and 12 month) across all indices. In addition, cross-ethnic pretest to posttest statistical equivalence (with a 10% to 20% variability margin) was ascertained on child self-reported fear ratings, parent reported fear ratings about the child as well as on parent-reported internalizing and externalizing child behavior problems. However, when using a hierarchical linear modeling strategy to evaluate program change in greater depth, Caucasian youths showed more improvement than Hispanic/Latino youths from pretest to posttest, followed by a greater degree of improvement from 6- to 12-month follow-up on child self-rated anxiety levels. In addition, along child self-rated fear levels, Caucasian youths showed more improvement from pretest to posttest relative to Hispanic/Latino youths. And, through the 3- to 6-month follow-up assessments, Caucasian youths showed a continued decline in fear levels compared to those exhibited by Hispanic/Latino youths. Thus, Hispanic/Latino children showed improvements but not as much as their Caucasian counterparts.

Building on knowledge gained from Pina et al. (2003), we conducted a randomized trial that tested a similar cognitive-behavioral protocol applied for indicated prevention and early intervention. Using a sample of 88 children (about 10.36 years old; 59.1% Hispanic/Latino most of whom were Mexican origin from Phoenix, Arizona) who presented with anxiety difficulties, Pina, Zerr, Villalta, and Gonzales (2012) randomized participants to a "child only" or "child plus parent" condition, with about 48% of families targeted in Spanish (based on need and preference). Program effects were examined along diagnostic rates, child symptoms, parent and child rating scales, and clinically significant change. In addition, program moderation analyses as a function of ethnicity and language were conducted. Results showed positive program response in terms of child anxiety symptoms using the Anxiety Disorders Interview Schedule for Children (ADIS-C), parent and child rating scales, and clinically significant change; although the "child plus parent" condition showed slightly greater gains in terms of ADIS-C child self-reported anxiety and depression levels as well as parent reported ADIS-P anxiety symptoms (about the child). In addition, none of the 16 children with symptoms and no diagnoses at pretest met criteria for an anxiety disorder diagnosis at posttest or follow-up based on the ADIS-C/P. For the remaining children with anxiety disorder diagnoses, only seven continued to meet criteria for their anxiety diagnosis at posttest, and only six children continued to meet criteria for their anxiety diagnosis at 6-month follow-up. No program moderation effects were found for ethnicity or language (Spanish vs. English) across measures.

In terms of cultural tailoring, interventionists in both our studies (Pina et al., 2012 and Pina et al., 2003 which used data from Silverman, Kurtines, Ginsburg, Weems, Lumpkin, et al., 1999 and Silverman, Kurtines, Ginsburg, Weems, Rabian, et al., 1999) were trained to take benefit of the vertical nature of the therapeutic relationship as well as to provide psychoeducation about child anxiety to caregivers in an effort to place the presenting problem in the contexts of culture (e.g., by drawing parallels between anxiety and *nervios*; by explaining the potential malleability of anxiety symptoms despite its temperament roots). It is important to note, however, that in practice there was variability between cases in degree of tailoring. In Pina et al. (2012), taking benefit of the vertical nature of the therapeutic relationship generally occurred with less acculturated families (e.g., when therapists assumed a more authoritative role and made

directive statements). With some cases, tailoring was generally applied early during the protocol (Session 3) or near the midpoint (Session 6) to improve engagement and increase homework compliance, especially in the context of competing family obligations (e.g., the target child serving as a caregiver for younger siblings, serving as translator or cultural broker for parents). For other cases, cultural tailoring did not occur at all. Thus, tailoring was variable and occurred based on program progress and client feedback thereby making it personalized.

OPTIMIZING CULTURAL ADAPTATION THROUGH PERSONALIZATION AND CONTROL SYSTEMS ENGINEERING

Building on our work with Hispanic/Latino children and families (as well as published research and theory), we have been developing a personalized approach to cultural tailoring. That is, we advocate using an individualized approach to modifying empirically based protocols that incorporates culturally specific information intended to meet the needs of a particular client rather than an entire ethnic (sub)group. As such, tailoring is determined based on client-centered assessment data relevant to his or her personal connection to culture as it relates to immediate program goals and planned long-term outcomes. Our focus on personalized tailoring is consistent with the work of McCabe and colleagues, who delivered Parent–Child Interaction Therapy to Mexican American families (McCabe & Yeh, 2009; McCabe, Yeh, Garland, Lau, & Chavez, 2005; McCabe, Yeh, Lau, Argote, 2012), Ayala et al.'s (2001) work in nutrition communication with Latinas, López's (2000) teaching of multicultural assessment, and Bickman's measurement feedback systems to enhance clinical decision making (Bickman, 2008; Kelley & Bickman, 2009; also see Kluger & DeNisi, 1996; Lambert, 2005). In fact, personalized tailoring might even fit well with the notion of disruptive innovations for the diffusion of evidence-based practices (Reinhardt & Gurtner, 2011; Rotheram-Borus, Swedeman, & Chorpita, 2012) because common and robust principles in cultural adaptation that emphasize consumer preferences could be identified to better reach children and families of color.

The need for a personalized approach is clear for several reasons. There is substantial evidence that culture and social context play a role in the development and maintenance of mental, emotional, and behavioral problems in children and adolescents (e.g., Alva & Reyes, 1999; Heinrichs et al., 2006; Okazaki & Sue, 1995; Szalacha et al., 2003). There also is research showing that some risk factors and resilience resources operate differently in culturally diverse and minority families (e.g., Varela, Weems, Berman, Hensley, & Rodriguez de Bernal, 2007). In addition, theory and data suggest there is within-cultural group and social context variability that may influence the link from risk and resilience to mental, emotional, and behavioral problems (e.g., Polo & López, 2009; Umana-Taylor, Diversi, & Fine, 2002). Building on this knowledge, Pina, Villalta, and Zerr (2009) further explained that as ethnic groups become increasingly fragmented and culturally transformed, for example, through intermarriage, immigration, mobility, and globalization (Ávila-Molero, 2003; Etzioni, 1998; Falicov, 2003; MacManus & Morehouse, 1997), the demand will increase for accommodating within-group cultural variation vis-à-vis a personalized (or prescriptive) approach. Thus, our approach emerges from the realization that "one size fits all" cultural adaptations do not adequately respond to the heterogeneity that exists within the cultural group of interest. Even within a Hispanic/Latino cultural subgroup there is variability. In the Latino mental health research area, for example, substantial data have been accumulating on the role that *familismo* (a family orientation that emphasizes identity, cohesiveness, and support) plays for Mexican American families, including data showing that even within this core value some degree of variability should be expected (Kupermic, Jurkovic, & Casey, 2009; Martinez, Polo, & Carter, 2012). For instance, a Mexican-origin caregiver could adhere to some but not all aspects of *familismo* when it comes to childrearing practices. There may be a value placed on *familismo*-support (def: high emphasis on close and supportive family bonds) and *familismo*-referent (def: high emphasis on having one's behavior meet with familial expectations) but not *familismo*-obligations (def: high emphasis on placing family needs over individual needs/desires). Similarly, there may be a value placed on *respeto* but not traditional gender roles. In addition, with increased acculturation to U.S. culture, there might be a value placed on independence and achievement (traditionally Anglo values) but not competition over collaboration. In essence, within person (and family) variations could prove a "Mexicanized" intervention unattractive (and ineffective) for families (and children) with cultural profiles that are variant, a growing phenomenon in contemporary sociocultural contexts.

In response, our conceptual approach proposes the use of decision rules for varying the cultural content and dosage of interventions or the degree of cultural adaptation, depending on the characteristics of the individual and his or her need for cultural adaption. This could translate into cultural tailoring at the person-level where, for example, *familismo*-support and *familismo*-obligations are targeted in an effort to

Downloaded by [Arizona State University] at 08:43 04 March 2015

increase the first but reduce the second, with no references made to traditional gender roles or *familismo*-referent (a different combination could be used for another case such as targeting *familismo*-support but not *familismo*-obligations). Empirically, evidence for the possibility that we need to move beyond the old "one size fits all" approach comes from trials showing positive program effects only for cultural subgroups (e.g., those with high affiliation to the culture of origin; Marsiglia, Kulis, Wagstaff, Elek, & Dran, 2005). Theoretically and methodologically, this idea fits well with the essence of L. M. Collins and colleagues' adaptive intervention designs. Focusing on adaptive preventive interventions, Collins, Murphy, and Bierman (2004) explained that unlike its predecessors with fixed protocol composition and dosage (every program component is administered to each child regardless of intervention needs), adaptive interventions assign different dosages of certain program components across or within individuals over time with the possibility of zero dosage (a component that is omitted). Thus, the spirit of L. M. Collins and colleagues' adaptive interventions already provides the structure for systematic research on personalized cultural tailoring. In addition, control systems engineering holds promise for testing a personalized approach to culture in intervention science. In fact, control systems engineering provides the dynamical systems model and algorithms needed to specify and test cultural applications that are interactive, and prescriptive (Navarro-Barrientos, Rivera, & Collins, 2011; Rivera, Pew, & Collins, 2007).

Control engineering considers how to manipulate system variables in order to transform dynamic behavior from undesirable to desirable. To achieve this goal, control systems engineering operates via variables that align well with intervention design and can improve implementation. For example, what control engineering defines as the controller (i.e., a mathematical set of relations that translate deviation from a goal into settings for a manipulated variable) can help refine what intervention science terms as the intervention dosage by generating decision rules to improve program response. What control engineering defines as a disturbance (i.e., a variable that influences the outcome but cannot be manipulated), aligns with what intervention science referred to as exogeneous variables (or even nonmodifiable moderators of program response). Thus, the control systems engineering approach could help refine intervention science in general and cultural adaptation science in particular. In fact, control engineering is increasingly gaining visibility across several other intervention contexts with perhaps the most well-known example coming from the *Fast Track Program* (Conduct Problems Prevention Research Group, 1992, 1999a, 1999b) and its family counseling adaptive component (see Rivera et al., 2007). In addition, Deshpande, Nandola, Rivera, and Younger (2011) described and examined the use of control engineering means for optimizing the effectiveness of behavioral interventions by assigning optimal dosages of naltrexone for fibromyalgia. In another article, Dong et al. (2012) presented a case and outline how control systems engineering methods can be used to evaluate decision rules for a time-varying, adaptive behavioral intervention to manage gestational weight gain in overweight and obese women. Similar work with a focus on control systems engineering methods for improving interventions targeting body mass and composition (Navarro-Barrientos et al., 2011), physical activity among older adults (Hekler et al., 2013), glucose-insulin (Bequette, 2009), substance misuse (Nandola & Rivera, 2013; Rivera et al., 2007), and smoking cessation (Timms, Rivera, Collins, & Piper, 2013) have appeared in the literature. As such, it seems the time is ripe for exploring what control systems engineering may have to offer to the process of culturally personalizing intervention efforts with the objective of securing evidence-based culturally robust interventions for ethnic minority children and their families.

Building on the adaptive interventions model and with control systems engineering, we illustrate, conceptually, our personalized approach for working in the contexts of cultural diversity. This example draws on our indicated prevention and early intervention for anxiety disorders in children, which featured an adaptive cultural component delivered by considering client input and expected program progress (Pina et al., 2012). The focus of the adaptive cultural component in Pina et al. (2012) was on promoting motivation and supporting program engagement. For example, in Pina et al. (2012), homework noncompliance was targeted for remediation via *familismo*-referent with the child (e.g., it is important to work hard and do one's best because this work reflects on the family). Resistance or ambivalence about out of session social skill practice was reframed from the perspective of *respeto* (e.g., children should always be polite when speaking to any adult; children should be on their best behavior when visiting the homes of friends or relatives). Note that the content focus of the adaptive cultural component was guided by the child and caregiver's endorsement of specific values (e.g., *respeto*) prior to the intervention based on the Mexican American Cultural Values Scale (Knight et al., 2009); if a value was not endorsed (e.g., traditional gender roles), then it was not included in the protocol for that family. Building on this exploratory approach, Figure 1 illustrates the block diagram for a feedback control loop describing an emerging adaptive intervention (called herein Cultural Strengths Affirmation protocol)

Downloaded by [Arizona State University] at 08:43 04 March 2015

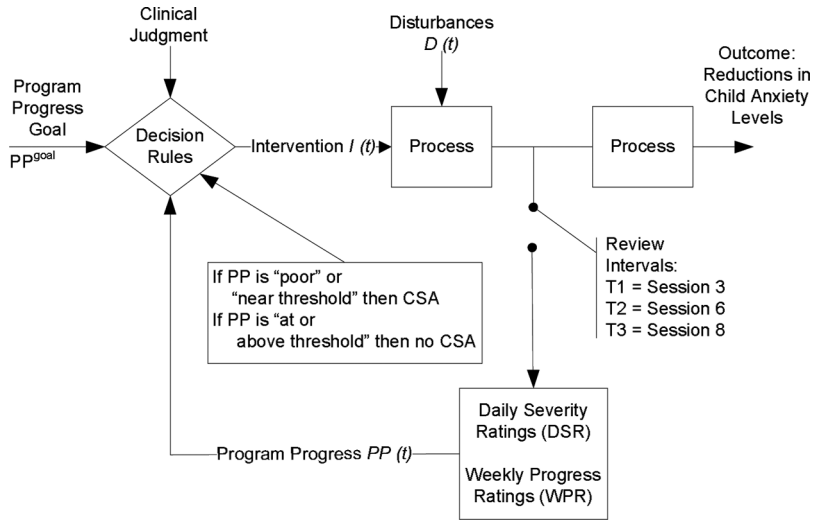


FIGURE 1 Block-diagram feedback control representation of a hypothetical adaptive component for an intervention focused on cultural tailoring. *Note*: PP = program progress; (t) = time; T = review interval time; CSA = Cultural Strengths Affirmation.

Downloaded by [Arizona State University] at 08:43 04 March 2015

that could be delivered as an adjunct to standard treatment or preventive interventions based on decision rules.

In terms of the feedback control loop, this conceptual example features one tailoring variable, program progress, or *PP(t)*, which engineering control systems labels as the "controlled variable." A value of program progress (assessed by a combination of child and parent generated weekly progress ratings and daily severity ratings) is received by the decision rule, which acts as the feedback controller. The decision rule compares the client's *PP(t)* to the target value of program process called the set point (PP^{goal}). In each loop the decision is whether to include a Cultural Strengths Affirmation (CSA) component, denoted by $I(t)$, as an adjunct to the standard intervention. At each successive review interval (Session 3, 6, and 8), the cycle is repeated and an updated value of the tailoring variable is obtained along with a decision (e.g., if *PP(t)* is poor or near threshold, then the CSA is applied). Consistent with each review interval, the CSA would be administered after each review interval only if *PP(t)* is poor or near threshold based on the predetermined set point (PP^{goal}). If *PP(t)* meets or exceeds the goal, then the intervention's cultural dosage should correspond to zero indicating no CSA be implemented. In addition, each cycle considers disturbances, denoted by $D(t)$, which represent the aggregate of time-varying characteristics or events that interfere with or deplete program progress. Based on data from Pina et al.'s (2012) trial, disturbances typically involve events that are likely beyond the child and/or parent's control (e.g., child getting sick with the flu, child psychiatric comorbidity, parent symptoms/disorders) but that interfere with program progress. When disturbances are present, clinical judgment is used to estimate whether the rule should be applied or delayed after another loop. Last, the outcome of the intervention is reductions in child anxiety levels (in this example, decision rules are based exclusively on program progress and changes in anxiety for simplicity; however, additional rules relevant to credibility, client engagement, satisfaction, retention, or therapeutic alliance could be implemented). In essence, the cultural adaptation approach we propose is person centered because it is driven by the individual's characteristics coupled with any emerging challenges systematically encountered over the course of implementation.

Continuing with the example, Figure 2 shows possible responses from implementing the rule-based controller under deterministic conditions. For simplicity, program progress, *PP(t)*, is operationalized here only on the basis of weekly progress ratings (WPR) and the adaptive intervention is the CSA. In this illustration, both program progress, *PP(WPR)(t)*, and cultural dosage, CSA *I(t),* have values ranging from 0% to 100%. Settings for *PP(t)* thresholds are time variant and based on WPR (thresholds could range from 60% to 80% based on a measure that reflects homework completion and milestones with the minimum level of child performance set at 60% effort). In terms of the anxiety reduction protocol, time-variant set points are assigned because the intervention places demands on the client that change from session to session (e.g., Session 2 = completed daily diaries vs. Session 5 = completed daily diaries, carried out an exposure, plus practiced relaxation). In addition, there is within-client variability in how much each program component is emphasized. In terms of the CSA intervention, however, potency is assumed to be linearly scaled and is defined according to 1-CSA module = 23.3%, 2-CSA modules = 46.6%, and 3-CSA modules = 69%. Across scenarios,

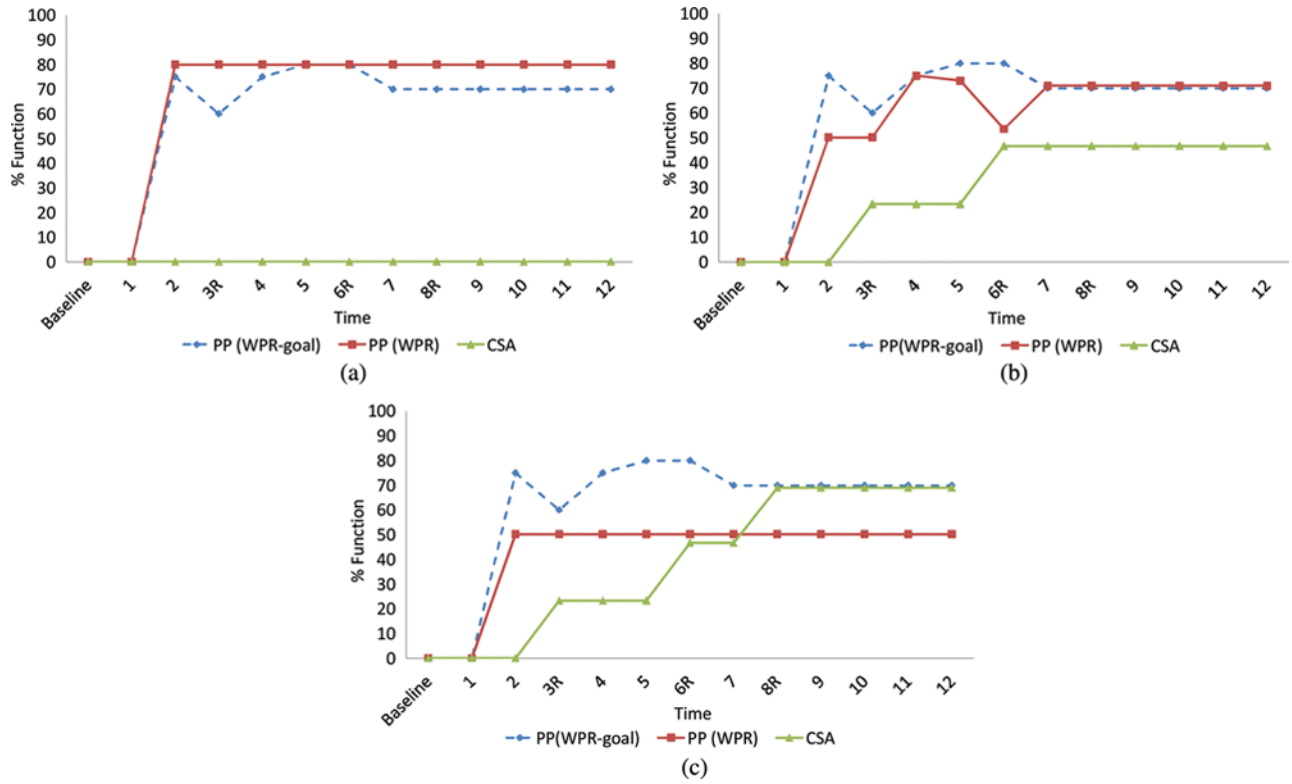


FIGURE 2 (a–c) Closed-loop response of a rule-based control system representation for three hypothetical cultural tailoring scenarios. *Note*: PP = program progress; WPR = weekly progress ratings; CSA = cultural strengths affirmation. (Figure appears in color online.)

PP(t) at baseline and Session 1 is considered to be at 0% but is then expected to increase at Session 2. In this conceptualization, and as seen in Figure 2a, the standard intervention works as expected, there is increase in *PP(t)* at Session 2 which then remains stable over 12 sessions. In addition, *PP(t)* is at or above the PP^{goal} (thresholds); therefore, no CSA is applied on the basis of the rule-base controller. In this scenario no cultural adaption is required. Turning to Figure 2b, the first review interval (at Session 3 R) reveals that *PP(t)* is below PP^{goal} and as the rule dictates CSA is applied. As shown, *PP(t)* increases as a function of CSA to the level of PP^{goal} by Session 4. Continuing with Figure 2b, the second review interval (at Session 6 R) reveals that *PP(t)* is again below PP^{goal}. As the rule dictates, a second CSA dosage is implemented. *PP(t)* then increases as a function of CSA to PP^{goal} by session 7. By the third review interval (at Session 8), *PP(t)* has reached the PP^{goal} and the rule-based policy determines that there is no need for another CSA dosage. Personalized cultural tailoring is concluded. In working from control systems engineering models, a phenomenon called "offset" may also occur and as such it needs to be considered herein. Depicted in Figure 2c, offset occurs when recommending higher dosages of the CSA intervention fails to produce *PP(t)* at or above the PP^{goal}. This outcome can result when the CSA is simply not efficacious (e.g., cultural factors are unrelated to intervention processes known to lead to anxiety symptom changes), there are substantial external disturbances, $D(t)$, that interfere with CSA effects, decision rules are invalid or unreliable, and/or review intervals are not properly timed.

This conceptual illustration expands on our initial theoretical description of the prescriptive approach (Pina et al., 2009) while retaining the proposition that program beneficiaries should act as cultural brokers who provide information for deriving a cultural map (e.g., knowledge about affiliation with values relevant to the culture of origin presumed to be relevant in the intervention), which guides the derivation of a cultural prescription. Moreover, when it comes to CSA content, we have identified some principal components that need to be tested as part of our adaptation framework. In Valles, Hernandez-Rodriguez, Hurtado, Zerr, Villalta, and Pina (2010), for example, we examined four focal variables: ethnicity (Mexican origin, Caucasian), cultural orientation (Mexican, Anglo), and caregiver program preferences while implementing the cognitive and behavioral procedures reported in Pina et al.'s (2012) trial. Relevant to the theorized CSA, results revealed that Mexican parents high on enculturation or Mexican-cultural orientation reported a preference for programs that relied on proverbs or "sayings"

Downloaded by [Arizona State University] at 08:43 04 March 2015

Downloaded by [Arizona State University] at 08:43 04 March 2015

instead of acronyms. This might be the case because proverbs and "sayings" are a typical way knowledge is transmitted in Hispanic/Latino culture in general and in Mexican culture in particular (Lafayette de Mente, 1996). Moreover, parents high on enculturation or Mexican-cultural orientation reported a preference for programs that emphasize family cohesion and support instead of child self-reliance. This finding is not surprising given the role *familismo* plays in the parent–child dyadic relationship (Hernández, Ramírez García, & Flynn, 2010; Kuhlberg, Peña, & Zayas, 2010; Santiago & Wadsworth, 2011; Smokowski & Bacallao, 2007; Smokowski, Rose, & Bacallao, 2008, 2010; Taylor, Larsen-Rife, Conger, & Widaman, 2012) and data showing that *familismo* sometimes operates as a protective factor for Hispanic/Latino youth (Ayón, Marsiglia, & Bermudez-Parsai, 2010; Gamble & Modry-Mandell, 2008; Germán, Gonzales, & Dumka, 2009; Morcillo et al., 2011).

Turning to the program effects we reported in Pina et al. (2012) and the putative tailoring variables, our data also showed interesting relations between tailoring and pre-to-post program changes. As shown in Table 1, analyses focusing on reliable observational data relevant to therapists' use of *familismo* principles in the intervention revealed greater program gains for the children based on parent report. Greater use of *familismo* principles in the intervention (e.g., therapist discusses the presenting problem in terms of how it affects family unit, therapist discusses rewards that center around family activities) were also linked to better program response along child internalizing, anxiety, and depression levels from the parents' perspective. This finding could translate into the emerging CSA protocol by incorporating *familismo*-support into the intervention to increase caregiver involvement, for example, if Review Interval 1 shows that program progress is below threshold (e.g., along child self-monitoring, contingency contracting). As such, the CSA serves to activate "evidence-based" behavior change strategies. Note that Table 1 also shows no significant relation between *familismo* and program changes based on child self-reported data. In fact, greater use of one aspect of *familismo* in the intervention (i.e., *familismo*-referent: therapists emphasizing that the child needs to do his or her best because this is a reflection of the family/make parents proud; therapists encouraging child to act as role model for younger siblings/show them to be brave) was linked to less program improvement as reported by the child. Whereas the positive effect of *familismo* based on parent-reported improvements in the child is encouraging and likely linked to cultural orientation and program expectations, it might be the case that child–parent differences in affiliation with Mexican culture, and thereby *familismo,* rendered

TABLE 1
Summary Findings on the Relations Among Child–Parent Characteristics, Cultural Adaptation Parameters, and Program Response

Ethnicity was related to treatment preference for implementation techniques among parents.	• Mexican-origin parents were more likely than Whites to prefer a program that employed Mexican proverbs rather than acronyms, $\chi^2(1, N=46)=8.52, p<.01$. • Mexican-origin parents were more likely than Whites to prefer a program that incorporated the use of social rewards (extended family activities, special family dinners) rather than tangible rewards (candy, toys), $\chi^2(1, N=52)=3.78, p<.05$.
Among parents, Mexican orientation was significantly related to preferences for treatment format and implementation techniques.	• Higher enculturation scores were associated with a preference for family support, $t(36)=2.16, p<.05$, rather than child self-reliance. • Higher enculturation scores were associated with a preference for the use of proverbs rather than acronyms, $t(42)=2.75, p<.01$.
Among children, Mexican orientation was significantly related to preferences for treatment format and implementation techniques.	• Higher enculturation scores were associated with a preference for a program in family format rather than child individual format, $t(16)=2.23, p<.05$. • Higher enculturation scores associated with a preference for the use of social rewards rather than tangible rewards in treatment, $t(25)=3.16, p<.01$.
Ratings of therapist's verbalizations coded as reflecting facets of *familismo* were significantly correlated with program response on selected parent and child completed measures.	• Total *Familismo* ratings correlated with CBCL Total ($r=.46$, $p<.05$), Internalizing ($r=.45$, $p<.05$), and Anxiety ($r=.60$, $p<.01$) pre- to postchange scores. • *Familismo* Cohesiveness ratings correlated with CBCL Anxiety ($r=.51$, $p<.05$) pre- to postchange scores. • *Familismo* Support ratings correlated with CBCL Total ($r=.46$, $p<.05$), CBCL Anxiety ($r=.57$, $p<.05$), and CDI ($r=.53$, $p<.05$) pre- to postchange scores. • *Familismo* Identity correlated with RCMAS Total ($r=-.55$, $p<.05$) pre- to postchange scores.

Note: CBCL = Child Behavior Checklist; CDI = Children's Depression Inventory; RCMAS = Revised Children's Manifest Anxiety Scale.

inclusion of this principle in the protocol irrelevant or unattractive for children who were low in Mexican cultural orientation. This finding and possibility suggests there might be a need for more carefully attending to culture in intervention development and testing, especially for child- and adolescent-focused protocols. In fact, based on these findings we believe our CSA approach would work best if focused on parents rather than children when it comes to anxiety prevention efforts with Hispanic/Latino families. This possibility, however, needs to be empirically evaluated.

CONCLUDING COMMENTS

To secure culturally responsive child anxiety interventions, some degree of cultural adaptation seems necessary based on findings from Cooley, Boyd, and Grados (2004); Cooley-Strickland et al. (2011); Huey and Pan (2006); Huey and Polo (2011); Griner and Smith (2006); Miller et al. (2011); Pina et al. (2003); and Pina et al. (2012). Research to date offers some sense about what might (or not) work. Specifically, it appears that focusing on language (e.g., content equivalence, semantic equivalence) and cultural enhancements (e.g., adding cultural symbols) is not sufficient to ensure the efficacy of apparently well-established procedures (e.g., cognitive and behavioral techniques). In our work with Hispanic/Latinos from Miami, Florida (mostly Cuban), we also emphasized normalization of the presenting problem, exploiting the vertical nature of the therapeutic relationship, and providing extensive psychoeducation (Pina et al., 2003; Silverman, Kurtines, Ginsburg, Weems, Lumpkin, et al., 1999; Silverman, Kurtines, Ginsburg, Weems, Rabian, et al., 1999). With Hispanic/Latinos from Phoenix, Arizona (mostly Mexican), we emphasized confidentiality (given the immigration climate in the community), effortful control (especially for males, given the value placed on *machismo*), exploiting the vertical nature of the therapeutic relationship, and providing extensive psychoeducation about the role *familismo* could play as a resource during the various learning challenges associated with the intervention. Moreover, across our trials there was a need for using a personalized approach to culture and tailoring, which fits well with the work of others (Ayala et al., 2001; López, 2000; McCabe & Yeh, 2009; McCabe et al., 2005; McCabe et al., 2012). To further develop, disseminate, and diffuse personalized approaches to cultural tailoring, a necessary next step is to determine which cultural tailoring parameters are effective and for whom. To reach this goal, we suggest using repeated measurement and feedback loops borrowed from engineering. Naturally, we do not assume that the only reason for lack of program progress or for the failures of "evidence-based" interventions with children and families of color is a lack of a "culture." Other reasons not linked to culture are plausible and in an effort to capture these, our model considers what we termed disturbances (e.g., poor sleep hygiene, which is high among Hispanic/Latino children and families; Alfano, Pina, Zerr, & Villalta, 2010). Beyond disturbances, there also are factors likely to play a critical role for some children of color, including poverty, neighborhood crime, and the adverse effects of policy (e.g., immigration laws, poor health care and educational resources; U.S. Department of Health and Human Services, 2001). As such, we advocate attention to *all* these issues in the contexts of population estimates showing that minority children and adolescents account for 46.5% of the child population in the United States (U.S. Census Bureau, 2011), an estimate that will undoubtedly increase over the next decade.

FUNDING

This research was supported in part by grant numbers K01MH086687 and L60MD001839 from the National Institute of Mental Health and the National Center of Minority Health and Health Disparities awarded to A. Pina. Additional funding support for this project comes from a prevention science fellowship awarded to L. Holly T32 MH018387 27 from the National Institute of Mental Health and K25DA021173 from the National Institute on Drug Abuse awarded to D. Rivera. The content is solely the responsibility of the authors and does not represent the official views of the funding agencies.

REFERENCES

Alfano, C. A., Pina, A. A., Zerr, A. A., & Villalta, I. K. (2010). Pre-sleep arousal and sleep problems of anxiety-disordered youth. *Child Psychiatry and Human Development*, *41*, 156–167. doi:10.1007/s10578-009-0158-5

Alva, S. A., & de los Reyes, R. (1999). Psychosocial stress, internalized symptoms, and the academic achievement of Hispanic adolescents. *Journal of Adolescent Research*, *14*, 343–356. doi:10.1177/0743558499143004.

Ávila-Molero, J. (2003). Toward a new Peruvianness? (Dis)encounters of the National in the sphere of the transnational. *Socialismo y Participación*, *96*, 77–85.

Ayala, G. X., Elder, J. P., Campbell, N. R., Engelberg, M., Olson, S., Moreno, C., & Serrano, V. (2001). Nutrition communication for a Latino community: Formative research foundations. *Family & Community Health*, *24*(3), 72–87. doi:10.1097/00003727-200110000-00009

Ayón, C., Marsiglia, F. F., & Bermudez-Parsai, M. (2010). Latino family mental health: Exploring the role of discrimination and familismo. *Journal of Community Psychology*, *38*, 742–756. doi:10.1002/jcop.20392

Barrett, P. M., Sonderegger, R., & Xenos, S. (2003). Using friends to combat anxiety and adjustment problems among young migrants to

Downloaded by [Arizona State University] at 08:43 04 March 2015

Downloaded by [Arizona State University] at 08:43 04 March 2015

Australia: A national trial. *Clinical Child Psychology and Psychiatry*, *8*, 241–260. doi:10.1177/1359104503008002008

Barrett, P., & Turner, C. (2001). Prevention of anxiety symptoms in primary school children: Preliminary results from a universal school-based trial. *British Journal of Clinical Psychology*, *40*, 399–410. doi:10.1348/014466501163887

Barrett, P. M., & Turner, C. M. (2004). Prevention of childhood anxiety and depression. In P. M. Barrett & T. H. Ollendick (Eds.), *Handbook of interventions that work with children and adolescents: Prevention and treatment* (pp. 429–474). London, England: Wiley & Sons.

Benish, S. G., Quintana, S., & Wampold, B. E. (2011). Culturally adapted psychotherapy and the legitimacy of myth: A direct-comparison meta-analysis. *Journal of Counseling Psychology*, *58*, 279–289. doi:10.1037/a0023626

Bequette, B. W. (2009). Glucose clamp algorithms and insulin time–action profiles. *Journal of Diabetes Science and Technology*, *3*, 1005–1013.

Bickman, L. (2008). A measurement feedback system (MFS) is necessary to improve mental health outcomes. *Journal of the American Academy of Child and Adolescent Psychiatry*, *47*, 1114–1119. doi:10.1097/CHI.0b013e3181825af8

Chavira, D. A., Stein, M. B., Bailey, K., & Stein, M. T. (2004). Child anxiety in primary care: Prevalent but untreated. *Depression and Anxiety*, *20*, 155–164. doi:10.1002/da.20039

Collins, L., Murphy, S., & Bierman, K. (2004). A conceptual framework for adaptive preventive interventions. *Prevention Science*, *5*, 185–196. doi:10.1023/b:prev.0000037641.26017.00

Conduct Problems Prevention Research Group. (1992). A developmental and clinical model for the prevention of conduct disorders: The Fast Track Program. *Development and Psychopathology*, *4*, 509–527. doi:10.1017/S0954579400004855

Conduct Problems Prevention Research Group. (1999a). Initial impact of the Fast Track prevention trial for conduct problems: I. The high-risk sample. *Journal of Consulting and Clinical Psychology*, *67*, 631–647. doi:10.1037/0022-006X.67.5.631

Conduct Problems Prevention Research Group. (1999b). Initial impact of the Fast Track prevention trial for conduct problems: II. Classroom effects. *Journal of Consulting and Clinical Psychology*, *67*, 648–657. doi:10.1037/0022-006X.67.5.648

Conger, R. D., & Rueter, M. A. (1996). Siblings, parents, and peers: A longitudinal study of social influences in adolescent risk for alcohol use and abuse. In G. H. Brody (Ed.), *Sibling relationships: Their causes and consequences* (pp. 1–30). Westport, CT: Ablex.

Cooley, M. R., Boyd, R. C., & Grados, J. J. (2004). Feasibility of an anxiety preventive intervention for community violence exposed African-American children. *Journal of Primary Prevention*, *25*, 105–123. doi:10.1023/B:JOPP.0000039941.85452.ea

Cooley-Strickland, M. R., Griffin, R. S., Darney, D., Otte, K., & Ko, J. (2011). Urban African American youth exposed to community violence: A school-based anxiety preventive intervention efficacy study. *Journal of Prevention and Intervention in the Community*, *39*, 149–166. doi:10.1080/10852352.2011.556573

Costello, E. J., Egger, H., & Angold, A. (2005). 10-year research update review: The epidemiology of child and adolescent psychiatric disorders: I. methods and public health burden. *Journal of the American Academy of Child & Adolescent Psychiatry*, *44*, 972–986. doi:10.1097/01.chi.0000172552.41596.6f

Costello, E. J., Erkanli, A., Federman, E., & Angold, A. (1999). Development of psychiatric comorbidity with substance abuse in adolescents: Effects of timing and sex. *Journal of Clinical Child Psychology*, *28*, 298–311. doi:10.1207/S15374424jccp280302

Dadds, M. R., Holland, D. E., Laurens, K. R., Mullins, M., Barrett, P. M., & Spence, S. H. (1999). Early intervention and prevention of anxiety disorders in children: Results at 2-year follow-up. *Journal of Consulting and Clinical Psychology*, *67*, 145–150. doi:10.1037//0022-006X.67.1.145

Dadds, M. R., Spence, S. H., Holland, D. E., Barrett, P. M., & Laurens, K. R. (1997). Prevention and early intervention for anxiety disorders: A controlled trial. *Journal of Consulting and Clinical Psychology*, *65*, 627–635. doi:10.1037/0022-006X.65.4.627

Deshpande, S., Nandola, N. N., Rivera, D. E., & Younger, J. (2011, June). A control engineering approach for designing an optimized treatment plan for fibromyalgia. In *American Control Conference (ACC), 2011* (pp. 4798–4803). Institute of Electrical and Electronics Engineers.

Dong, Y., Rivera, D. E., Thomas, D. M., Navarro-Barrientos, J. E., Downs, D. S., Savage, J. S., & Collins, L. M. (2012, June). A dynamical systems model for improving gestational weight gain behavioral interventions. *In American Control Conference (ACC), 2012* (pp. 4059–4064). Institute of Electrical and Electronics Engineers.

Essau, C. A., Conradt, J., Sasagawa, S., & Ollendick, T. H. (2012). Prevention of anxiety symptoms in children: Results from a universal school-based trial. *Behavior Therapy*, *43*, 450–464. doi:10.1016/j.beth.2011.08.003

Etzioni, A. (1998). Some diversity. *Society*, *35*, 59–61.

Falicov, C. J. (2003). Immigrant family processes. In F. Walsh (Ed.), *Normal family processes: Growing diversity and complexity* (3rd ed., pp. 280–300). New York, NY: Guilford.

Fisak, B., Jr., Richard, D., & Mann, A. (2011). The prevention of child and adolescent anxiety: A meta-analytic review. *Prevention Science*, *12*, 255–268. doi:10.1007/s11121-011-0210-0

Gamble, W. C., & Modry-Mandell, K. (2008). Family relations and the adjustment of young children of Mexican descent: Do family cultural values moderate these associations? *Social Development*, *17*, 358–379. doi:10.1111/j.1467-9507.2007.00429.x

Germán, M., Gonzales, N. A., & Dumka, L. E. (2009). Familism values as a protective factor for Mexican-origin adolescents exposed to deviant peers. *Journal of Early Adolescence*, *29*, 16–42. doi:10.1177/0272431608324475.

Glantz, M. D., & Leshner, A. I. (2000). Drug abuse and developmental psychopathology. *Development and Psychopathology*, *12*, 795–814. doi:10.1017/S0954579400004120

Griner, D., & Smith, T. B. (2006). Culturally adapted mental health intervention: A meta-analytic review. *Psychotherapy: Theory, Research, Practice, Training*, *43*, 531–548. doi:10.1037/0003-066x.42.1.37

Heinrichs, N., Rapee, R. M., Alden, L. A., Bogels, S., Hofmann, S. G., Oh, K. J., & Sakano, Y. (2006). Cultural differences in perceived social norms and social anxiety. *Behaviour Research and Therapy*, *44*, 1187–1197. doi:10.1016/j.brat. 2005.09.006

Hekler, E. B., Buman, M. P., Poothakandiyil, N., Rivera, D. E., Dzierzewski, J. M., Morgan, A. A.,. . . Giacobbi, P. R. (2013). Exploring behavioral markers of long-term physical activity maintenance: A case study of system identification modeling within a behavioral intervention. *Health Education & Behavior*, *40*, 51S–62S. doi:10.1177/1090198113496787

Hernández, B., Ramírez García, J. I., & Flynn, M. (2010). The role of familism in the relation between parent–child discord and psychological distress among emerging adults of Mexican descent. *Journal of Family Psychology*, *24*, 105–114. doi:10.1037/a0019140

Hourigan, S. E., Settipani, C., Southam-Gerow, M. A., & Kendall, P. C. (2012). Coping Cat: A cognitive-behavioral treatment for childhood anxiety disorders. In A. Rubin (Ed.), *Empirically supported programs and interventions in child welfare* (pp. 91–104). New York, NY: Wiley.

Huey, S., Jr., & Pan, D. (2006). Culture-responsive one-session treatment for phobic Asian Americans: A pilot study. *Psychotherapy: Theory, Research, Practice, Training*, *43*, 549–554. doi:10.1037/0033-3204.43.4.549

Huey, S., & Polo, A. (2008). Evidence-based psychosocial treatments for ethnic minority youth: A review and meta-analysis. *Journal of*

Clinical Child and Adolescent Psychology, *37*, 260–299. doi:10.1080/15374410701820174

Institute of Medicine. (2009). *Preventing mental, emotional, and behavioral disorders among youth people: Progress and possibilities*. Washington, DC: National Academies Press.

Kelley, S. D., & Bickman, L. (2009). Beyond outcomes monitoring: Measurement feedback systems (MFS) in child and adolescent clinical practice. *Current Opinion in Psychiatry*, *22*, 363–368. doi:10.1097/YCO.0b013e32832c9162

Kendall, P. C. (1985). *Advances in cognitive-behavioral research and therapy*. San Diego, CA: Academic Press.

Kendall, P. C. (2000). Guiding theory for therapy with children and adolescents. In P. C. Kendall (Ed.), *Child and adolescent therapy: Cognitive-behavioral procedures* (2nd ed., pp. 3–26). New York, NY: Guilford.

Kendall, P. C., Panichelli-Mindel, S. M., Sugarman, A., & Callahan, S. A. (1997). Exposure to child anxiety: Theory, research, and practice. *Clinical Psychology: Science and Practice*, *4*, 29–39. doi:10.1111/j.1468-2850.1997.tb00096.x

Kessler, R. C., Ruscio, A. M., Shear, K., & Wittchen, H. (2009). Epidemiology of anxiety disorders. In M. B. Stein (Ed.), *Oxford handbook of anxiety and related disorders* (pp. 19–33). New York, NY: Oxford University Press.

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, *119*, 254–284. doi:10.1037/0033-2909.119.2.254

Knight, G. P., Gonzales, N. A., Saenz, D. S., Bonds, D. D., German, M., Deardorff, J., . . . Updegraff, K. A. (2010). The Mexican American Cultural Values scales for adolescents and adults. *Journal of Early Adolescence*, *30*, 444–481. doi:10.1177/0272431609338178

Kuhlberg, J., Peña, J., & Zayas, L. (2010). Familism, parent–adolescent conflict, self-esteem, internalizing behaviors and suicide attempts among adolescent Latinas. *Child Psychiatry and Human Development*, *41*, 425–440. doi:10.1007/s10578-010-0179-0

Kuperminc, G. P., Jurkovic, G. J., & Casey, S. (2009). Relation of filial responsibility to the personal and social adjustment of Latino adolescents from immigrant families. *Journal of Family Psychology*, *23*, 14–22. doi:10.1037/a0014064

Lafayette de Mente, B. (1996). *NTC's dictionary of Mexican cultural code words: The complete guide to keywords that express how the Mexicans think, communicate, and behave*. Chicago, IL: NTC Publishing.

Lambert, M. J. (2005). Emerging methods for providing clinicians with timely feedback on treatment effectiveness: An introduction. *Journal of Clinical Psychology*, *61*, 141–144. doi:10.1002/jclp.20106

Lock, S., & Barrett, P. M. (2003). A longitudinal study of developmental differences in universal preventive intervention for child anxiety. *Behaviour Change*, *20*, 183–199. doi:10.1375/bech.20.4.183.29383

López, S. R. (2002). Teaching culturally informed psychological assessment: Conceptual issues and demonstrations. *Journal of Personality Assessment*, *79*, 226–234. doi:10.1207/S15327752JPA7902_06

Lowry-Webster, H. M., Barrett, P. M., & Dadds, M. R. (2001). A universal prevention trial of anxiety and depressive symptomatology in childhood: Preliminary data from an Australian study. *Behaviour Change*, *18*, 36–50. doi:10.1375/bech.18.1.36

Lowry-Webster, H. M., Barrett, P. M., & Lock, S. (2003). A universal prevention trial of anxiety symptomology during childhood: Results at 1-year follow-up. *Behaviour Change*, *20*, 25–43. doi:10.1375/bech.20.1.25.24843

MacManus, S. A., & Morehouse, L. (1997). Redistricting in the multiracial twenty-first century: Changing demographic and socioeconomic conditions pose important challenges. *National Political Science Review*, *6*, 116–136.

Marsiglia, F. F., Kulia, S., Wagstaff, D. A., Elek, E., & Dran, D. (2005). Acculturation status and substance use prevention with Mexican and Mexican-American youth. In M. R. De La Rosa, L. K. Holleran & S. L. A. Straussner (Eds.), *Substance abusing Latinos: Current research on epidemiology, prevention, and treatment* (pp. 85–111). Philadelphia, PA: Haworth.

Martinez, W., Polo, A. J., & Carter, J. S. (2012). Family orientation, language, and anxiety among low-income Latino youth. *Journal of Anxiety Disorders*, *26*, 517–525. doi:10.1016/j.janxdis.2012.02.005

McCabe, K., & Yeh, M. (2009). Parent–child interaction therapy for Mexican Americans: A randomized clinical trial. *Journal of Clinical Child and Adolescent Psychology*, *38*, 753–759. doi:10.1080/15374410903103544

McCabe, K. M., Yeh, M., Garland, A. F., Lau, A. S., & Chavez, G. (2005). The GANA program: A tailoring approach to adapting parent child interaction therapy for Mexican Americans. *Education and Treatment of Children*, *28*, 111–129.

McCabe, K., Yeh, M., Lau, A., & Argote, C. B. (2012). Parent–child interaction therapy for Mexican Americans: Results of a pilot randomized clinical trial at follow-up. *Behavior Therapy*, *43*, 606–618. doi:10.1016/j.beth.2011.11.001

Mifsud, C., & Rapee, R. M. (2005). Early intervention for childhood anxiety in a school setting: Outcomes for an economically disadvantaged population. *Journal of the American Academy of Child and Adolescent Psychiatry*, *44*, 996–1004. doi:10.1097/01.chi.0000173294.13441.87

Miller, L. D., Laye-Gindhu, A., Bennett, J. L., Liu, Y., Gold, S., March, J. S., . . . Waechtler, V. E. (2011). An effectiveness study of a culturally enriched school-based CBT anxiety prevention program. *Journal of Clinical Child and Adolescent Psychology*, *40*, 618–629. doi:10.1080/15374416.2011.581619

Morcillo, C., Duarte, C. S., Shen, S., Blanco, C., Canino, G., & Bird, H. R. (2011). Parental familism and antisocial behaviors: Development, gender, and potential mechanisms. *Journal of the American Academy of Child and Adolescent Psychiatry*, *50*, 471–479. doi:10.1016/j.jaac.2011.01.014

Nandola, N., & Rivera, D. E. (2013). An improved formulation of hybrid Model Predictive Control with application to production-inventory systems. *IEEE Transactions on Control Systems Technology*, *21*, 121–135.

Navarro-Barrientos, J. E., Rivera, D. E., & Collins, L. M. (2011). A dynamical model for describing behavioural interventions for weight loss and body composition change. *Mathematical and Computer Modelling of Dynamical Systems*, *17*, 183–203. doi:10.1080/13873954.2010.520409

Okazaki, S., & Sue, S. (1995). Methodological issues in assessment research with ethnic minorities. *Psychological Assessment*, *7*, 367–375. doi:10.1037//1040-3590.7.3.367

Ortiz, C., & Del Vecchio, T. (2013). Cultural diversity: Do we need a new wake-up call for parent training? *Behavior Therapy*, *44*, 443–458. doi:10.1016/j.beth.2013.03.009

Pardini, D., White, H. R., & Stouthamer-Loeber, M. (2007). Early adolescent psychopathology as a predictor of alcohol use disorders by young adulthood. *Drug and Alcohol Dependence*, *88*, S38–S49. doi:10.1016/j.drugalcdep.2006.12.014

Pina, A. A., Silverman, W. K., Fuentes, R. M., Kurtines, W. M., & Weems, C. F. (2003). Exposure-based cognitive-behavioral treatment for phobic and anxiety disorders: Treatment effects and maintenance for Hispanic/Latino relative to European-American youths. *Journal of the American Academy of Child and Adolescent Psychiatry*, *42*, 1179–1187. doi:10.1097/00004583-200310000-00008

Pina, A. A., Villalta, I. K., & Zerr, A. A. (2009). Exposure-based cognitive behavioral treatment of anxiety in youth: An emerging culturally-prescriptive framework. *Behavioral Psychology*, *17*, 111–135.

Pina, A. A., Zerr, A. A., Villalta, I. K., & Gonzales, N. A. (2012). Indicated prevention and early intervention for childhood anxiety:

Downloaded by [Arizona State University] at 08:43 04 March 2015

A randomized trial with Caucasian and Hispanic/Latino youth. *Journal of Consulting and Clinical Psychology*, *80*, 940–946. doi:10.1037/a0029460

Polo, A. J., & López, S. R. (2009). Culture, context, and the internalizing distress of Mexican American youth. *Journal of Clinical Child and Adolescent Psychology*, *38*, 273–285. doi:10.1080/15374410802698370

Reinhardt, R., & Gurtner, S. (2011). Enabling disruptive innovations through the use of customer analysis methods. *Review of Managerial Science*, *5*, 291–307. doi:10.1007/s11846-011-0069-2

Rivera, D. E., Pew, M. D., & Collins, L. M. (2007). Using engineering control principles to inform the design of adaptive interventions: A conceptual introduction. *Drug and Alcohol Dependence*, *88*, S31–S40. doi:10.1016/j.drugalcdep.2006.10.020

Rotheram-Borus, M. J., Swendeman, D., & Chorpita, B. F. (2012). Disruptive innovations for designing and diffusing evidence-based interventions. *American Psychologist*, *67*, 463–476. doi:10.1037/a0028180

Santiago, C. D., & Wadsworth, M. E. (2011). Family and cultural influences on low-income Latino children's adjustment. *Journal of Clinical Child and Adolescent Psychology*, *40*, 332–337. doi:10.1080/15374416.2011.546038

Silverman, W. K., Kurtines, W. M., Ginsburg, G. S., Weems, C. F., Lumpkin, P. W., & Carmichael, D. H. (1999). Treating anxiety disorders in children with group cognitive-behaviorial therapy: A randomized clinical trial. *Journal of Consulting and Clinical Psychology*, *67*, 995–1003. doi:10.1037/0022-006X.67.6.995

Silverman, W. K., Kurtines, W. M., Ginsburg, G. S., Weems, C. F., Rabian, B., & Serafini, L. T. (1999). Contingency management, self-control, and education support in the treatment of childhood phobic disorders: A randomized clinical trial. *Journal of Consulting and Clinical Psychology*, *67*, 675–687. doi:10.1037/0022-006x.67.5.675

Silverman, W. K., Pina, A. A., & Viswesvaran, C. (2008). Evidence-based psychosocial treatments for phobic and anxiety disorders in children and adolescents. *Journal of Clinical Child and Adolescent Psychology*, *37*, 105–130. doi:10.1080/15374410701817907

Simon, E., Bögels, S. M., & Voncken, J. M. (2011). Efficacy of child-focused and parent-focused interventions in a child anxiety prevention study. *Journal of Clinical Child and Adolescent Psychology*, *40*, 204–219. doi:10.1080/15374416.2011.546039

Smokowski, P., & Bacallao, M. (2007). Acculturation, internalizing mental health symptoms, and self-esteem: Cultural experiences of Latino adolescents in North Carolina. *Child Psychiatry and Human Development*, *37*, 273–292. doi:10.1007/s10578-006-0035-4

Smokowski, P. R., Rose, R., & Bacallao, M. L. (2008). Acculturation and Latino family processes: How cultural involvement, biculturalism, and acculturation gaps influence family dynamics. *Family Relations*, *57*, 295–308. doi:10.1111/j.1741-3729.2008.00501.x

Smokowski, P., Rose, R., & Bacallao, M. (2010). Influence of risk factors and cultural assets on Latino adolescents' trajectories of self-esteem and internalizing symptoms. *Child Psychiatry and Human Development*, *41*, 133–155. doi:10.1007/s10578-009-0157-6

Szalacha, L. A., Erkut, S., Coll, C. G., Alarcon, O., Fields, J. P., & Ceder, I. (2003). Discrimination and Puerto Rican children's and adolescents' mental health. *Cultural Diversity and Ethnic Minority Psychology*, *9*, 141–155. doi:10.1037/1099-9809.9.2.141

Taylor, Z. E., Larsen-Rife, D., Conger, R. D., & Widaman, K. F. (2012). Familism, interparental conflict, and parenting in Mexican-origin families: A cultural–contextual framework. *Journal of Marriage and Family*, *74*, 312–327. doi:10.1111/j.1741-3737.2012.00958.x

Teubert, D., & Pinquart, M. (2011). A meta-analytic review on the prevention of symptoms of anxiety in children and adolescents. *Journal of Anxiety Disorders*, *25*, 1046–1059. doi:http://dx.doi.org/10.1016/j.janxdis.2011.07.001

Timms, K. P., Rivera, D. E., Collins, L. M., & Piper, M. E. (2013). A dynamical systems approach to understand self-regulation in smoking cessation behavior change. *Nicotine and Tobacco Research*. Advance online publication. doi:10.1093/ntr/ntt149

Umana-Taylor, A. J., Diversi, M., & Fine, M. A. (2002). Ethnic identity and self-esteem among Latino adolescents: Distinctions among the Latino populations. *Journal of Adolescent Research*, *17*, 303–327. doi:10.1177/0743558402173005

U.S. Census Bureau, Current Population Survey, & Annual Social and Economic Supplement. (2011). *Minority population in the United States: 2010 table*. Washington, DC: Government Printing Offices.

U.S. Department of Health, & Human Services. (2001). *Mental health: Culture, race, and ethnicity—A supplement to mental health: A report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services.

Valles, C., Hernandez Rodriguez, J., Hurtado, G. M., Zerr, A. A., Villalta, I. K., & Pina, A. A. (2010, August). *Treatment preferences among Mexican-origin youth and parents referred to a mental health clinic*. Paper presented at the Annual Conference of the American Psychological Association, San Diego, CA.

Varela, R. E., Weems, C. F., Berman, S. L., Hensley, L., & Rodriguez de Bernal, M. C. (2007). Internalizing symptoms in Latinos: The role of anxiety sensitivity. *Journal of Youth Adolescence*, *36*, 429–440. doi:10.1007/s10964-007-9168-4

Wu, P., Goodwin, R. D., Fuller, C., Liu, X., Comer, J. S., Cohen, P., & Hoven, C. W. (2010). The relationship between anxiety disorders and substance use among adolescents in the community: Specificity and gender differences. *Journal of Youth and Adolescence*, *39*, 177–188. doi:10.1007/s10964-008-9385-5

Downloaded by [Arizona State University] at 08:43 04 March 2015