

Reducing Mental Health Disparities by Increasing the Personal Relevance of Interventions

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## Abstract

One of the most persistent health disparities is the underutilization of mental health services by people of color. Neither evidence-based treatments (universal focus), nor culturally-adapted treatments (group focus), have reduced these disparities. We propose the Personal Relevance of Psychotherapy (PROP) model that integrates universal, group, and individual dimensions to determine the personal relevance of interventions. A cultural example of personal relevance among people of East Asian ancestry involves “face” (i.e., one’s prestige and position in society) which may moderate treatment outcomes. Pragmatic intervention approaches focused on helping individuals cope with specific external problems, as compared to managing a “personal” disease, can effectively “restore” face. Thus, social problem-solving interventions may be more personally relevant to many people of East Asian ancestry than approaches that are internally-focused. In addition, we posit that social neuroscience can offer unique opportunities above and beyond self-report measures when assessing the impact of PROP and the personal relevance of interventions for diverse populations. Our preliminary evidence upon testing this hypothesis indicated that among Asian Americans, exposure to problem-solving therapy content elicited significantly greater neural activity in brain areas associated with personal relevance as compared to exposure to cognitive-behavioral therapy content. Identifying personally-relevant interventions has the potential to reduce mental health disparities by increasing engagement with mental health services for diverse groups. The increased client engagement produced by personally-relevant interventions also has the potential to make mental health services more effective for diverse groups.

Keywords: Evidence-based treatments, cultural adaptations, personal relevance, social neuroscience, Asian Americans

Public Significance: Mental health services have not effectively addressed the needs of people of color. This may be because existing mental health services are not personally relevant. Cultural adaptations and social neuroscience may help improve the personal relevance of mental health services to people of color.

### Reducing Mental Health Disparities by Increasing the Personal Relevance of Interventions

One of the most persistent health disparities is the underutilization of mental health services by people of color. A meta-analysis of over 4 million participants indicates that African Americans, Asian Americans, and Latinx Americans evidence lower lifetime rates of mental health service use than European Americans (Smith & Trimble, 2016). Although it is possible that service disparities may reflect a lesser need for services (Miranda, McGuire, Williams, & Wang, 2008), the results of epidemiological studies indicate that the majority of European Americans with mental disorders seek mental health services; whereas, only one-third or less of African Americans, Latinx Americans, and Asian Americans do so (Jackson et al., 2007; Meyer, Zane, Cho, & Takeuchi, 2009; Villatoro, Morales, & Mays, 2014).

Mental health service use is theoretically understood to be a process model inclusive of multiple stages of help-seeking decisions and behaviors. Research has shown that racial disparities stem from several of these steps: (a) low perceived need for services; (b) low outreach to services; (c) initial help seeking, but dropping out before the intake session; and (d) premature treatment dropout (Akutsu, Tsuru, & Chu, 2014). Personally-relevant treatments may play a crucial role in increasing initial points of contact with mental health services, because of the importance of community recommendations and referrals. We define *personal relevance* as how meaningful and useful an intervention is to a given person, and whether the treatment approach being used is seen as credible and matches clients' belief systems and perceptions of what would be beneficial to them. Social network theory conceives of help-seeking as a behavior that occurs through the process of influence and advice from one's social network (Pescosolido & Boyer, 2010). For example, Wong, Brownson, Rutkowski, Nguyen, and Becker (2014) found that lower rates of initial contact with mental health services by Asian Americans compared to European

American college students were explained by fewer people and family members advising and referring suicidal Asian Americans to seek help. As such, it may be particularly important for previous psychotherapy experiences by ethnic minority community stakeholders to be personally relevant and engaging.

Leong (1996) addressed these mental health disparities by formulating a biopsychosocial model to allow psychotherapy to be more responsive to the needs of diverse populations by considering Universal, Group, and Individual Dimensions (Figure 1). The *Universal* dimension represents the idea that all human beings share common characteristics, regardless of sex, race, or ethnicity. These shared characteristics consist of both biological and physical commonalities. Evidence to support the notion that humans share physical characteristics is abundant in many fields, such as biology, medicine, and neuroscience. The *Group* dimension has been especially important in the areas of cross-cultural psychology, feminist psychology, and psychotherapy. It is believed the human population can be subdivided into various groups (e.g., culture, race, ethnicity, social class, occupation, sex, gender orientation), where the bond shared among group members distinguishes them from other groups. However, the group-based dimensional model of psychotherapy makes broad assumptions about groups and often ignores important *within-group* variability. Indeed, the field of psychology often focuses on identifying and studying these individual differences within the *Individual* dimension. Nevertheless, psychology's focus on individual differences often overlooks the social contexts (i.e., groups) that may condition the expression of these differences. Therefore, universal determinants of health are moderated by social determinants, which in turn are moderated by psychological or individual determinants.

Leong (1996) also argued that using any of the dimensions in a unidimensional fashion would have limited validity and utility in psychotherapy. Recent scientific advances in precision

medicine, cognitive neuroscience, and epigenetics have also lent support to the value of the biopsychosocial model. Cacioppo and Decety (2011) articulated the challenges of studying complex behavior (e.g., mental illness and treatments) by noting that “Such an endeavor is challenging because it necessitates the integration of multiple levels. Mapping across systems and levels (from genome to social groups and cultures) requires interdisciplinary expertise, comparative studies, innovative methods, and integrative conceptual analysis” (p. 162).

We posit that a failure to integrate Universal, Group, and Individual dimensions in mental health services has perpetuated mental health disparities. Whereas the evidence-based treatment (EBT) movement has overemphasized the Universal dimension, the culturally-adapted treatments (CAT) movement has overemphasized the Group dimension. Both approaches have been broadly applied without personalizing them to the needs of individuals. We propose that the personal relevance of a psychological intervention can influence both its credibility and its effectiveness. In addition, the methods of social neuroscience and multicultural psychology, which involves specifying and measuring the mechanisms of cultural influences on behavior in ethnocultural groups underrepresented in research (Hall, Yip, & Zárate, 2016), can further supplement and enhance clinical science by evaluating personal relevance, thus extending the reach of mental health services.

### **The Interplay Between Evidence-Based Treatments and Culturally-Adapted Treatments**

Proponents of EBTs assume that there are universal mechanisms of healing (Elliott & Mihalic, 2004). The assumed universal effects of psychotherapy interventions may have evolved from the recognition that certain common mechanisms are necessary components of intervention effectiveness. For example, cognitive-behavioral therapy (CBT) situates problems within the individual. Underlying the success of CBT is a client’s ability to effectively monitor, identify,

and reframe thoughts and engage in healthy behaviors, which ultimately impact mood. The impetus for the EBT movement was evidence-based medicine, which advocated that medical interventions be based on scientific evidence and that drugs be evaluated on the basis of randomized clinical trials (RCTs; Norcross, Beutler, & Levant, 2006). RCTs were applied by the EBT movement to the evaluation of psychological interventions and included treatment manuals with a focus on treatment adherence and fidelity. An emphasis was also placed on replicating intervention effects across different contexts. If an intervention can be disseminated with fidelity, the context is assumed to have little influence on the intervention's effects.

Similar to RCTs assessing different medications, early EBT protocols targeted specific diagnoses and did less to address the role of patient-based factors in treatment. Trials of EBTs typically limited study populations based on the target diagnosis, excluded patients with comorbid diagnoses, and assessed outcomes based on changes in symptoms in the target diagnosis. The approach assumed treatments focused on a target diagnosis eliminated the need to consider individual patient factors in clinical decision-making. Although more recent EBT protocols focus on transdiagnostic problems and strategies, they continue to focus on treating symptoms without regard to individual differences in values, beliefs, and contexts.

Unfortunately, the emphasis on the universal aspects and effects of interventions has had limited impact on reducing the aforementioned persistent mental health disparities between European Americans and groups of color in the United States (SAMHSA, 2015; Smith & Trimble, 2016). Moreover, the universal approach may not be uniformly effective for European Americans, as results from a meta-analysis indicate that fidelity has a limited effect on symptom change (Webb, DeRubeis, & Barber, 2010). A singular approach to treatment that is high in

fidelity, but too general, may not always meet the individual needs of patients. CATs have been developed to expand the cultural reach of EBTs.

### **Cultural Adaptations**

There have been a variety of causes attributed to the mental health disparities for people of color, including service accessibility, service user preferences, and provider behavior (Le Cook et al., 2015). Each of these causes would potentially have different solutions. One advocated solution has been increasing the diversity of the work force (DeCarlo Santiago & Miranda, 2014). However, recent meta-analyses indicate that matching therapists and clients from the same ethnic group is weakly or not significantly associated with treatment outcome in terms of symptom reduction (Hall, Ibaraki et al., 2016; Smith & Trimble, 2016). Thus, a diverse provider workforce, which involves the Group dimension, is not a complete solution to mental health disparities.

Another proposed solution to mental health disparities that does not rely on therapist ethnicity is the training of culturally-competent providers. Cultural competence involves: (a) awareness of one's own assumptions, values, and beliefs and how they can affect interactions with clients; (b) knowledge of clients' cultures and worldviews; and (c) skills in providing culturally-relevant treatment (D. Sue, Arredondo, & McDavis, 1992). A culturally competent therapist addresses contextual concerns beyond the individual, such as family, school, and work, as well as broader societal influences on the individual, such as discrimination, poverty, and poor access to resources (Chu, Leino, Pflum, & Sue, 2016). However, in a recent meta-analysis, patients' perceptions of therapist cultural competence were only mildly associated with symptom reduction (Smith & Trimble, 2016). Perhaps this is because cultural competence addresses culture at a general (Group) level and is not adequately tailored to the individual. Alternatively,

patients are usually distraught and focused on improvement and may have difficulty assessing therapist cultural competence. When they can assess cultural competence, they may or may not be able to truly understand its relevance to treatment outcomes.

There is accumulating evidence that the impact of treatments for culturally diverse groups is limited because evidence-based interventions do not address contextual features that may make treatments relevant to the mental health issues salient to diverse populations (Zane & Huang, 2016). For example, culturally-based concerns about loss of “face” (i.e., one’s prestige and position in society) may inhibit self-disclosure in therapy (Leong et al., 2018). Similarly, societal experiences of discrimination may result in cultural mistrust, which can interfere with the therapeutic alliance (Whaley, 2001). CATs have been developed to be responsive to clients’ cultural and sociocultural contexts.

The rationale for CATs has included: (a) culture-specific influences on psychopathology; (b) a lack of engagement in EBTs for diverse groups; and (c) relative ineffectiveness of EBTs with diverse groups (Bernal & Adames, 2017; Castro, Barrera, & Steiker, 2010; Hall, 2001; Lau, 2006). Culture-specific influences on psychopathology include a greater focus on the group than the individual, experiences of discrimination based on group membership, ethnocultural variations in symptomatology, and group-specific forms of spirituality (Bernal & Adames, 2017; Hall, 2001). Recent meta-analyses indicate that mental health interventions adapted to address culturally-salient mental health issues tend to be more effective than unadapted or orthodox interventions when used with culturally-diverse groups (Hall, Ibaraki et al., 2016; Smith & Trimble, 2016). Unlike the small or negligible effects of therapist characteristics (e.g., ethnicity, cultural competence), the effects of cultural adaptations on treatment outcomes are in the medium range. CATs tailor interventions to be responsive to cultural issues, such as language

and cultural values and norms, that may deter or enhance effectiveness (Castro et al., 2010).

Whereas the EBT movement emphasized the fidelity of interventions, the CAT movement emphasized addressing important cultural factors and the flexible applications of EBTs to better fit the needs of diverse groups.

### **Limited Impact of Culturally-Adapted Treatments**

Notwithstanding these advances in culturally-informed care, there has been little progress in the field to significantly reduce mental health disparities among people of color. In fact, there is no evidence that the burden of mental illness has lessened for these populations and communities over the past few decades (SAMHSA, 2015; Smith & Trimble, 2016). This lack of impact of CATs may be a function of their limited availability rather than of limitations of CATs themselves. Nevertheless, there are limitations of CATs.

CATs often lack a shared or systematic framework that articulates why and how the adaptations are effective (Zane & Huang, 2016). Most CATs are “top down” modifications of interventions developed for European Americans, which usually do not adequately address issues or dynamics specific to a cultural context (Hall, Ibaraki et al., 2016). Moreover, often little empirical evidence is presented that the intervention has affected the cultural issue or dynamic targeted by the adaptation (e.g., reduce cultural mistrust, mitigate face loss and shame; Zane, Kim, Bernal, & Guotaco, 2016). Clearly, what is needed is an evidence-based approach to culturally-informed care that can systematically guide efforts to adapt EBTs in a robust and efficient way so these interventions can be widely applied in practice, but be sufficiently flexible to accommodate individual differences within a particular ethnic group (Stirman et al., 2017). A systematic application of specific culturally-salient variables is needed to guide cultural

adaptations as well as clinical practice. Consequently, the intervention can be better positioned to simultaneously address important cultural group issues and be patient-centered.

CATs clearly extend the reach of evidence-based interventions. However, similar to the universal evidence-based approach, CATs tend to be broadly applied as they address cultural features associated with a particular group. However, a particular cultural feature may not apply to some people within that group. Moreover, members of a cultural group may naturally vary on various features (e.g., acculturation level, racial identity, family-centeredness). In these cases, the benefit from a culturally-adapted intervention may be limited. For example, an intervention for Latinx populations adapted to address intergenerational issues may benefit recent immigrants and their families, but may be less beneficial for those who are more acculturated. Thus, *cultural* relevance is not necessarily equivalent to *personal* relevance.

Recently, greater emphasis has been placed on more precise, mechanism-focused studies in which the research examines how specific psychological constructs associated with ethnic or cultural group differences (i.e., the specific aspects of culture) moderate treatment effectiveness (Zane et al., 2016). Recent advancements in CATs have also recognized the influence of cultural variables on specific aspects of treatment, such as engagement, treatment delivery, the therapeutic framework, and treatment materials (Chu & Leino, 2017). This shift to study culturally-salient variables (e.g., family orientation, cultural mistrust, racial or cultural identity, face concern, shame and stigma, historical trauma, racial microaggressions) allows us to better explain and understand the specific aspects of a group's culture that may influence treatment. Moreover, because these constructs vary across individuals as well as groups, they can also capture important variations among individuals within a cultural group. In this way, the last level of analysis (i.e., the Individual level), can be incorporated in the research design of a mental

health intervention study, and the analysis of cultural group characteristics can inform mental health practice beyond the mere stereotyping of a client of color. Nevertheless, the lack of precision in cultural adaptations has impeded the development of more efficient and scalable interventions for populations for whom conventional treatment is ineffective. Consideration of the personal relevance of interventions may be the missing link in reaching these populations.

### **The Importance of Personal Relevance of Interventions**

Using the Individual level of analysis to complement the Universal and Group levels is necessary because the relative effectiveness of a mental health intervention ultimately depends on its relevance and meaningfulness to an individual client. This reality is at the core of the emphasis on patient-centered care in medicine, health, and mental health (i.e., the “precision medicine” concept of delivering the right treatment to the right person at the right time; Cuijpers, Ebert, Acarturk, Andersson, & Cristea, 2016). For example, one reason that people of color are less likely than European Americans to seek conventional mental health treatment is that they do not perceive it as personally beneficial (J. Kim & Zane, 2016). This lack of personal relevance may also be reflected in the underutilization of mental health services by people of color discussed previously (Smith & Trimble, 2016). Making an intervention understandable, meaningful, and self-relevant to the patient is one of the core principles (along with collaborative decision-making) driving patient-centered care. Personal relevance incorporates individual or client characteristics or risk factors (e.g., sex, gender orientation, age, education, acculturation, personality dimensions, attitudes towards help-seeking, social support, clinical severity, medical and psychiatric comorbidity) that have been shown to be generally predictive of outcomes (e.g., Fedewa et al., 2016).

### **Elaboration Likelihood Model of Persuasion**

According to the Elaboration Likelihood Model of Persuasion (ELM; Petty & Cacioppo, 1986; Figure 1), attitude change is more likely when engagement with a persuasive message is high (central processing) than when it is low (peripheral processing). In a treatment context, the personal relevance of a specific component of a therapy approach may be determined by whether it increases engagement and recruits central processing. However, a broad application of treatment techniques may not be effective for many clients because the techniques are not personally relevant and are processed peripherally, if at all. Clients are likely to engage more deeply with the therapeutic process when they find the experience of therapy and the therapist to be personally relevant.

The core concepts in ELM may appear similar to the distinction between surface and deep structural adaptations of interventions (Resnicow et al., 2000). Surface adaptations involve matching interventions and clients on peripheral characteristics, such as therapist-client ethnic and language matching or adding cultural examples of concepts. Deep adaptations incorporate cultural understanding of illness and healing. Surface adaptations, which are most common, may enhance the feasibility of an intervention by making it understandable or accessible, whereas deep adaptations may enhance engagement by addressing principles of change and are presumed to determine treatment impact (Chu & Leino, 2017). However, heterogeneity within ethnic groups is acknowledged along dimensions such as ethnic identity (Resnicow et al., 2000). Thus, deep structural adaptations designed for a particular ethnic group are not necessarily equal in their personal relevance for all members of an ethnic group.

A cultural example of personal relevance is that among people of East Asian ancestry, face concerns may moderate treatment outcomes. Face has been identified as a key interpersonal dynamic in Asian social relations, especially when the relationship involves seeking help for

personal issues (Zane & Yeh, 2002). The emphasis in CBT on the self rather than on social relations, as well as the emphasis on self-disclosure, has the potential for a “loss of face” among people of East Asian ancestry. Indeed, face concerns were found to mitigate self-disclosure among Asian Americans in a counseling analogue study (Zane & Ku, 2014). Interpersonal concerns in self-disclosure may be salient for those from collectivistic backgrounds. Moreover, Asian Americans are less likely than European Americans to perceive conventional interventions, such as CBT, as beneficial (J. Kim & Zane, 2016). In other words, components of the conventional CBT approach may not be personally relevant to many Asian Americans because they overemphasize the self and underemphasize the self in relation to others. From an ELM perspective, for many Asian Americans, a focus in therapy on the self may engage peripheral processing whereas a focus on the self in relation to others may engage central processing. For those from collectivistic backgrounds, the impact of mental illness on interpersonal functioning may be as important as, if not more important, than individual improvements in intrapersonal functioning.

Although loss of face is relevant for many people of East Asian ancestry, Asian Americans are not uniformly concerned about face. Face concerns have been found to significantly differ among Asian American groups and acculturation is negatively associated with face concerns (Leong et al., 2017). Thus, the personal relevance of face concerns for a particular Asian American client can be moderated by group membership and acculturation.

### **Pragmatic Problem-Solving Approaches**

Approaching personal issues as solving specific external problems, as opposed to managing a “personal” disease, can effectively restore face for those who have such concerns (Domenici & Littlejohn, 2006). Culturally, Asian Americans are more likely than their non-

Asian counterparts to have been raised in environments where awareness of internal experiences is less important than external situational demands. With this reduced emphasis on internal states, Asian Americans may find the demand in CBT to reflect on and target their thoughts, emotions, and behaviors as less personally relevant and familiar than one focused more on targeting interpersonal and situational factors. Moreover, many Asian Americans delay help-seeking due to stigma, and come to treatment with severe symptoms wanting a pragmatic approach to problem solving (Hwang, 2006). Psychotherapy should provide relevant, immediate, and tangible benefits to ensure client engagement (i.e., central processing) in psychotherapy (Sue & Zane, 1987). An external problem-solving orientation is also culturally-syntonic to Asian values. Focusing on the problem helps the client feel more comfortable in treatment, whereas, a premature focus on cognitive reframing can elicit an aversive reaction because clients want to change their triggers and are less reluctant to make internal shifts, sometimes feeling blamed when therapists ask them to make internal change (Domenici & Littlejohn, 2006).

Some existing versions of CBT do focus on pragmatic social problem-solving. Problem-Solving Therapy (PST; Nezu & Nezu, 2016) addresses stressful problems that occur in real-world contexts. Social problem-solving is the process by which people attempt to cope with stressful problems by altering the problem situation, their reaction to the problem situation, or both (Nezu, Nezu & D’Zurilla, 2013). PST can be viewed by Asian Americans as being educational in nature, as it teaches individuals to use a set of tools to better cope with (i.e., solve) problems in living. Although PST is an effective intervention for reducing psychopathology, such as depression (Cuijpers, 2017) and a variety of other psychological difficulties (Nezu & Nezu, 2019), it has not been extensively evaluated with diverse populations. However, evidence

from a focus group of Asian American community mental health providers indicates that PST can be culturally relevant for Asian Americans (Chu, Huynh, & Areán, 2012).

Hwang (2006, 2016) has culturally-adapted CBT to provide a strong initial focus on goal setting and external problem-solving. Internal cognitive reframing occurs after external problem-solving efforts have been attempted. Domains targeted for cultural adaptation include understanding dynamic issues and cultural complexities, orienting clients to psychotherapy, understanding cultural beliefs about mental illness, improving the client-therapist relationship, understanding differences in the expression and communication of distress, and addressing culture-specific issues. In addition, strategies include providing cultural-clinical bridges through a comprehensive therapy orientation, focus on stigma reduction, integration of cultural metaphors and symbols, and use of cultural and philosophical teachings. This intervention, which focuses on stressful problems in the real world, is a pragmatic approach that is likely to be personally relevant for many Asian Americans, particularly those who have face concerns.

Hwang's (2006; 2016) approach is different from many other CATs because it is theory-driven whereby modifications have been clearly delineated and justified. It integrates a "top down" approach to cultural adaptation with a "bottom up" approach that capitalizes on culture-specific issues and dynamics. This cultural adaptation of CBT to initially focus on problem-solving has been found to reduce depression among Chinese Americans more than unadapted CBT, although both approaches were found to be effective (Hwang et al., 2015). However, Hwang et al. (2015) also argued that it may be difficult to truly test a culturally-adapted versus unadapted intervention when working with non-English speaking clients. Specifically, even though strictures can be put in place to reduce the amount and depth of cultural adaptations, the

unadapted CBT in this study was technically a surface structure adaptation as it was conducted at an ethnic-specific service center and delivered by bilingual and ethnically-matched therapists.

### **The Personal Relevance of Psychotherapy (PROP) Model**

CATs are putatively more personally relevant to people of color than are unadapted EBTs (Castro et al., 2010). CATs are developed for broad ethnic groups (e.g., African Americans, Latinx Americans) to provide a wide reach. However, cultural adaptations have been developed based on group characteristics (e.g., stigma, interdependence, somatic expression of symptoms) that still may not be relevant to individual patient needs (S. Sue & Zane, 1987). For example, CATs may not be particularly personally relevant for highly acculturated clients. Therefore, we propose the Personal Relevance of Psychotherapy (PROP) model to collectively consider universal, group, and individual factors that influence whether a treatment is seen as credible or personally relevant. As depicted in Figure 1, PROP synthesizes knowledge from EBTs that is designed for general social contexts, as well as knowledge from CATs that is designed for particular cultural contexts. This integration helps to determine the applicability of elements from both intervention approaches to the personal context of the individual client.

The emphasis on personal relevance should not be considered reductionist, implying that treatments simply have to be personally relevant to be effective. Rather, the personal relevance approach facilitates the integration of Universal and Group level approaches with the Individual level. For example, ethnocultural group-level research has found that individuals from collectivistic cultures tend to be more concerned with group priorities and allocentric values. This research has generated adaptations of EBTs that address these values. However, as indicated earlier, few studies have provided evidence that such adaptations have actually had their assumed effect on clients at a personal, individual level. Essentially, the personal relevance

approach provides a systematic, empirically-based way to test the hypotheses that have been generated by the Group level approach. Moreover, with respect to practical and clinical utility, it provides more precise information about which aspects of the treatment may have the most impact on a particular client. The task in precision medicine is dynamic sizing, which involves assessing when to generalize and when to individualize based on an individual's social, cultural, and individual contexts (S. Sue, 1998).

For example, with psychodynamic psychotherapy (PP), concepts believed to be culture-universal (e.g., unconscious conflicts, defense mechanisms, development of insight, and attachment to parental figures) are applied to all people (Summers & Barber, 2009). However, CATs would argue that each of the above might need to be culturally adapted to address culture-specific issues such as collectivism vs. individualism and the interdependent vs. independent self to be more relevant to a client of Asian descent (e.g., attachment and parent-child relationships may take on different characteristics in collectivistic vs. individualistic cultures). Moreover, culturally adapting PP to address differences in cultural orientation may not be sufficient to address the needs of a particular Asian American client. A client may have grown up in the U.S. and be struggling with ethnic identity, sexual orientation, and cultural conflict, and find it difficult to balance their individual vs. familial needs and worldviews. Consequently, the client may have individual characteristics and an intersectional identity that may not be fully addressed by the universal or CAT approach (i.e., a client may identify as gay, and attachment to parental figures takes on a completely different tenor because parent-child issues need to not only address attachment, but also cultural orientation and sexual orientation). PROP seeks to integrate cultural group tendencies with individual dimensions to make treatments more personally relevant to increase their effectiveness.

### **Can Social Neuroscience Enhance the Assessment of Personal Relevance in Psychotherapy?**

The statistically significant effects of cultural adaptations may underestimate their actual effectiveness, as the outcome measures used in most studies are not culturally- or individually-tailored (Hall, Ibaraki et al., 2016). Given the challenges in solely relying on self-report measures, especially when assessing highly stigmatized issues, such as those associated with mental illness, social neuroscience approaches may offer a promising and alternative way to address how personally meaningful and self-relevant an intervention is to the individual client. Neural measures are complementary to self-report with certain advantages such as being less susceptible to experimenter demand and social desirability, measurable even without an overt response from the participant, and affording an examination of underlying processes (e.g., self-relevance). Evidence also suggests that the self-relevance of an intervention (as assessed using neuroscience methods) may predict its effectiveness (Falk, Berkman, & Lieberman, 2012). Across a range of studies relevant to the ELM model, neural activation increases in attention (superior frontal gyrus, lateral parietal cortex) and self-processing networks (medial prefrontal and posterior cingulate cortices) are implicated in central processing of persuasive messages (Cacioppo, Cacioppo, & Petty, 2018). Thus, neuroimaging presents another way to evaluate the personal relevance of a treatment approach for a given individual.

Research on both the self and self-processing have been a focus of social neuroscience since its earliest days (Klein, Loftus, & Kihlstrom, 1996). One of the most robust effects in the field is the implication of the medial prefrontal cortex (mPFC) in self-processing (Amodio & Frith, 2006). This region's activation is found to increase when people reflect on their traits (Pfeifer, Lieberman, & Dapretto, 2007), attitudes and preferences (Ames, Jenkins, Banaji, & Mitchell, 2008), and ongoing emotional experience (Ochsner et al., 2004). As consistent as the

involvement of the mPFC in self-processing is, it is also true that self-processing is not uniquely associated with activity in this region. Other processes, some of which are closely related to the self, also recruit activation in mPFC, including value judgments, emotion, and some aspects of social cognition (Amodio, Harmon-Jones, & Berkman, 2018). A fair characterization, then, might be that the mPFC is involved in processes related to the functional aspects of the self, including attending to, placing value on, and remembering stimuli that are self-relevant.

In support of this characterization, the mPFC is active when people process (non-self) information that subsequently influences their behavior. For example, activation in mPFC among other brain regions while people viewed New York Times articles predicted the likelihood that participants would choose to share those articles with others on social media (Baek et al., 2017). In studies with cigarette smokers who intended to quit, the degree of mPFC response while viewing anti-smoking messages predicted both their individual cessation success (Falk et al., 2011) and the effectiveness of the messages at the population level (e.g., city, state; Falk et al., 2012). In terms of the ELM, these findings suggest that activity in the mPFC reflects self-relevance or depth of processing or both, either of which would help explain why activation then predicted behavior change.

Interestingly, in the studies described above, self-reported personal relevance of the quit-smoking campaigns did not predict effectiveness. Thus, neuroimaging might be a more sensitive tool than self-report in identifying the most personally-relevant and effective treatments for particular individuals (Berkman & Falk, 2013). This might be because people do not always know exactly what makes a message compelling (e.g., Nisbett & Wilson, 1977), even though the computations performed in the mPFC appear to track their relative persuasiveness. In this way, neuroimaging offers a promising complement to self-reports to more precisely bridge the

individual level of analysis with the universal and group levels to achieve an integrative biopsychosocial approach to study the multidimensional impact of a mental health intervention for culturally-diverse individuals. However, neuroimaging of the mPFC has yet to be used to predict outcomes of mental health interventions (Gabrieli, Ghosh, & Whitfield-Gabrieli, 2015). We have begun to investigate the relative personal relevance of internally- vs. externally-focused intervention approaches in a pilot neuroimaging study involving mPFC activation.

### **Pilot Neuroimaging Study: Neural Activation as an Indicator of Personal Relevance**

Given the above context, we reasoned that, to the extent to which mPFC activation is an index of self-processing, it can provide a window into the factors that drive the effectiveness of therapeutic approaches that engage central processing. As an initial proof-of-concept demonstration of this idea, we conducted a pilot neuroimaging study with Asian Americans, who are unlikely to perceive conventional treatments as beneficial (J. Kim & Zane, 2016). We hypothesized that PST would be seen as more personally relevant than CBT due to factors in Asian American cultures that align better with PST. Thus, we predicted that Asian Americans would demonstrate greater mPFC activity when they viewed PST vs. CBT therapeutic content.

We recruited a sample of  $N = 28$  Asian American participants (9 men and 19 women,  $M_{\text{age}} = 37.6$ ,  $SD = 13.5$ ) from the Eugene, OR community (71% East Asian, 7% Southeast Asian, 22% mixed Asian) to participate in an fMRI study. The participants were 64% U.S.-born, 36% first generation (Asian-born), 43% second generation (U.S.-born), and 21% third generation (U.S.-born and parents U.S.-born). In the magnetic resonance imaging (MRI) scanner, we acquired whole-brain functional neuroimages (fMRI) as participants completed a task assessing the self-relevance of vignettes that reflected treatment content gleaned from PST (Nezu et al., 2013) and CBT manuals (Beck, 2011). We also gathered structural images to aid in

normalization. The task consisted of 20 blocks of trials (10 from each treatment), where each block contained a single vignette excerpted from the PST or CBT manual divided into 4 – 5 one-sentence trials. Each trial displayed a sentence from the vignette for 6 seconds in a large font. CBT trials focused on negative automatic thoughts and internal behavioral experiments. PST trials focused on problem-solving, including problem definition, generating alternatives, decision-making, and solution implementation. After each block of trials, participants rated how “personally relevant” and “helpful to you” the content was, as well as its positivity, on 5-point Likert rating scales (1 = “Not at all,” 3 = “Somewhat,” and 5 = “Extremely”). The data were preprocessed and analyzed using a standardized fMRI pipeline, fMRIPrep (Esteban et al., 2018). We used a voxel-wise  $p$ -value of .005 and a cluster-extent threshold of 150 to control the cluster familywise error rate. Following the neuroimaging procedure, the Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992) and Asian Values Scale (AVS; B. Kim, Atkinson, & Yang, 1999) were administered to assess ethnic and cultural identity.

As expected under the hypotheses that (a) PST is more self-relevant than CBT for Asian Americans, and (b) mPFC tracks with self-relevance, we found significantly greater activation in self-processing regions while participants viewed PST vs. CBT content, including medial and ventromedial prefrontal cortex and ventral striatum (Figure 2). We additionally found that activation in these regions was not significantly correlated with participants’ ratings of personal relevance, helpfulness, or positivity in either condition. Moreover, none of these ratings were significantly different between the PST vs. CBT conditions. Thus, the self-report ratings of personal relevance and neuroimaging data provide different windows into self-relevance.

First- and second-generation participants exhibited greater mPFC response to PST vs. CBT content than did third generation participants (Figure 3), which is consistent with our

hypothesis that PST is particularly self-relevant for less acculturated Asian Americans. Although we did not have a non-Asian control group to determine if these effects are specific to Asian Americans, this within-group variability suggests that acculturation may moderate perceptions of self-relevance. However, participants' responses to the MEIM and AVS were not significantly correlated with neural response. This relative lack of sensitivity of self-report measures may be because there are important cultural components associated with country of origin or the immigration experience (e.g., pragmatic orientation) that are not fully assessed by these measures. In future work, the effects of acculturation and ethnic identity on the personal relevance of psychotherapy could be examined with other immigrant groups (e.g., Latinx).

Our neuroimaging data provide initial support for the proof-of-concept that neural activation might be useful in assessing self-relevance of therapy elements. Specifically, although the self-report ratings of the vignettes were associated with the neural data, self-reported personal relevance of PST versus CBT was not significantly different. Thus, neural activation appeared to be a more sensitive measure of personal relevance than self-report. Of course, we cannot draw general conclusions given the small sample involving a single ethnic group, but we hope this dissociation between self-report and neural data can serve as one example of how neuroimaging data can add utility above and beyond existing tools (e.g., self-report). Notably, we are not suggesting that therapists conduct neuroimaging to assess personal relevance. Rather, we posit that neuroimaging can be used to gather evidence regarding the personal relevance of treatments that therapists could then deploy, such as offering patients a choice of treatment approaches.

### **Clinical Implications of Personal Relevance**

Personal relevance as a mechanism of therapeutic engagement and effectiveness has much promise in making interventions more engaging and in reducing mental health utilization

disparities. However, there are many challenges in applying personal relevance to clinical practice. Clients seeking mental health services are usually distressed and may be unable to determine which intervention seems more personally relevant, even when given examples of different approaches. In our pilot study discussed above, participants' self-reports of the personal relevance of vignettes did not significantly differ between two intervention approaches, although they exhibited significantly greater neural response to PST than to CBT. On a group level, Asian Americans may have a preference for PST over CBT. It is important to note that some clients may not be aware of the most personally-relevant intervention approach or at least may be unable to explicitly self-report the relative personal relevance of different treatment protocols.

Therapists may be able to assist clients in determining the personal relevance of an intervention by implementing dynamic sizing to determine the relative contributions of universal, group, and individual influences (S. Sue, 1998). The Aptitude-Treatment Interaction (ATI) paradigm was proposed to assess an individual's readiness to benefit from a particular intervention (Snow, 1991). Aimed at countering the client-uniformity-myth, the ATI paradigm recognizes the important interaction between individual aptitude or personal relevance with any specific treatment modality. A recent comprehensive approach is Systematic Treatment Selection, which helps therapists choose an intervention from a variety of universal approaches based on a patient's personal qualities and problem characteristics (Beutler & Clarkin, 2014). Cultural group considerations have been incorporated into the approach (Song et al., 2015).

In research and clinical settings, hypotheses can be developed integrating universal, group, and individual considerations. For example, CBT, an intervention intended for universal application, would be hypothesized to be more personally relevant for European Americans than for Asian Americans because of its internal focus. Conversely, PST, another intervention

intended for universal application, would be hypothesized to be more personally relevant for Asian Americans than for European Americans because of its external focus on problems. Within each ethnic group, however, concern about loss of face would be hypothesized to moderate these effects. Those who have a greater concern about loss of face would view PST as more personally relevant because of its ability to restore face by addressing pragmatic issues, as discussed previously. Those who are less concerned about loss of face would view CBT as more personally relevant. Although Asian Americans tend to be more concerned about loss of face than European Americans are, there is also a range of face concerns among European Americans (Leong et al., 2018). Thus, concern about loss of face could be an important moderator of personal relevance for all clients. Presumably, loss of face is implicated in central processing of intervention content. To the extent that measures of loss of face moderate the personal relevance of an intervention as assessed by social neuroscience methods, these measures could serve as a proxy for the information gained from this approach. Such proxy measures could potentially serve as a substitute in clinical settings for more expensive neuroimaging methods. Based on previous smoking cessation research (Falk et al., 2012), we would hypothesize that matching clients and treatments on the basis of personal relevance would enhance treatment effectiveness.

Although therapists may have resources that are not accessible to the client (e.g., knowledge of research) in helping determine for a client the personal relevance of an intervention, they may unduly influence the client's perception of personal relevance. Many clients may readily defer to a therapist's recommendations, which may be considered expert opinions. Such deference to authority may be pronounced in some cultural groups. Thus, soliciting and incorporating client feedback in the clinical setting becomes especially critical (cf.

Persons, 2008). A collaborative assessment of personal relevance incorporating therapist and client perspectives may be optimal.

### **Conclusions**

We have proposed a precision-medicine, theory- and evidence-based model (PROP) for personalizing treatments that has potential for research and clinical applications. The model involves a multi-level consideration of Universal, Group, and Individual influences. We contend that health disparities have resulted from a failure to simultaneously consider all three of these levels. Based on the PROP model, we make the following recommendations:

1. Dynamic sizing that considers how universal healing principles and group cultural contexts influence individuals can be implemented to assess the personal relevance and effectiveness of interventions. Consideration of all three levels of influence does not always necessitate cultural adaptations, but can involve matching an individual's needs (e.g., face concern) with existing approaches (e.g., PST).
2. Moderators of personal relevance and intervention effectiveness that may determine the relative importance of Universal, Group, and Individual dimensions should be identified. In this article, we have discussed loss of face and acculturation as important moderators.
3. Social neuroscience methods can be employed in research to assess subtle aspects of personal relevance that may not be adequately assessed via self-report. Our preliminary pilot study provides additional evidence that activation in regions such as the ventromedial prefrontal cortex can be useful in examining theoretical questions related to personal relevance. Future research should develop lower-cost, more scalable measures (e.g., self-reports) that might be proxy indices of neural activation. Another recommendation is for clinical scientists to look for process-level variables (e.g.,

therapeutic alliance), in addition to self-relevance, that are implicated by theory to be involved in treatment effectiveness, and partner with social and cognitive neuroscientists to use neuroimaging to test the theorized process.

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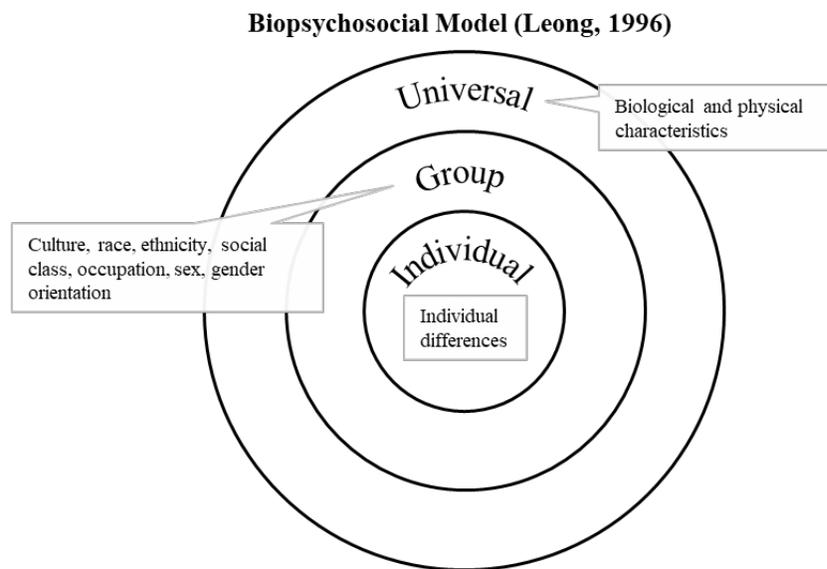
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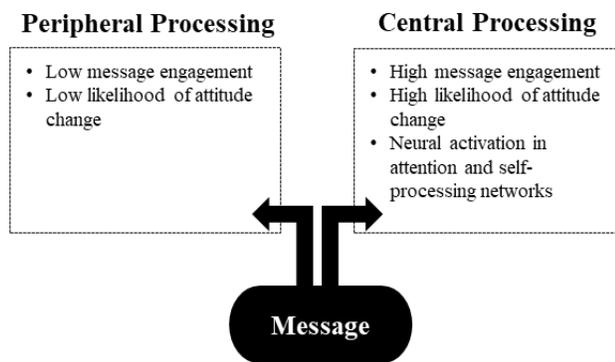
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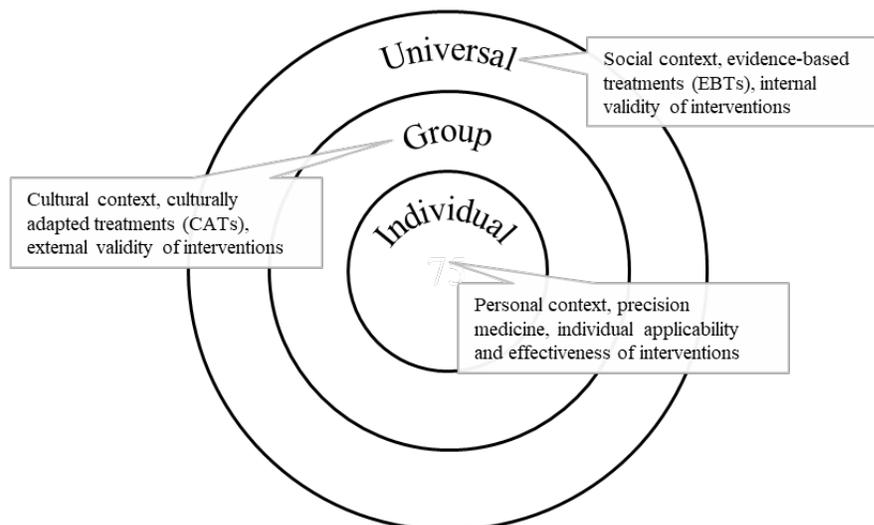
**Figure 1. Models of Psychotherapy and Behavior Change**

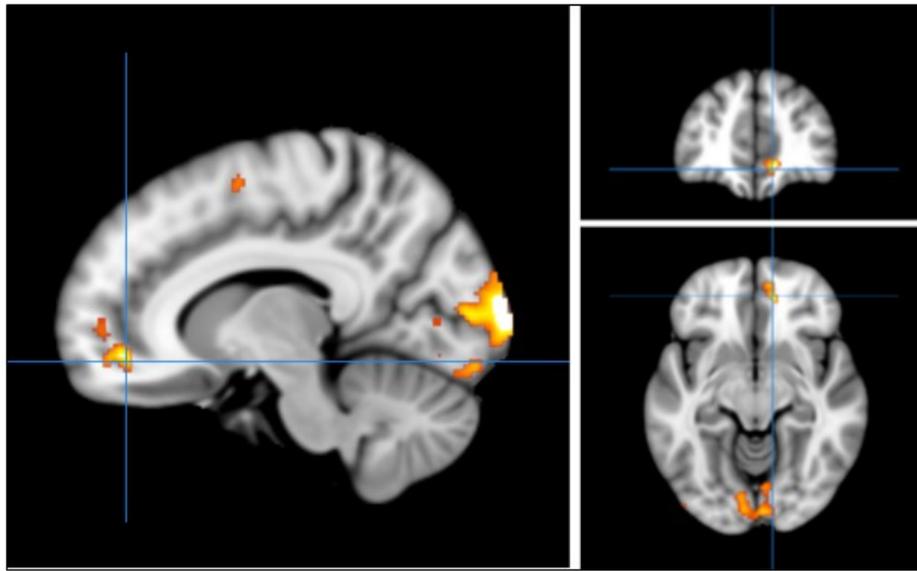


**Elaboration Likelihood Model (ELM) of Persuasion (Petty & Cacioppo, 1986)**

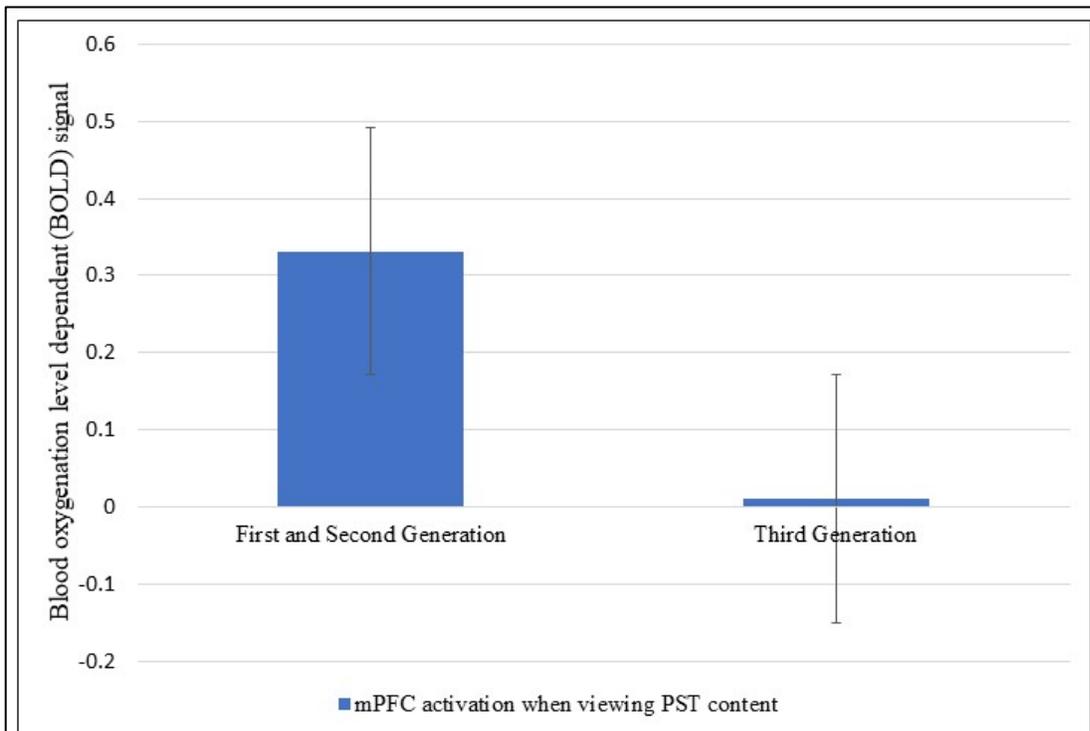


**Personal Relevance of Psychotherapy (PROP)**





**Figure 2.** Neural activation in the PST > CBT contrast ( $P < .005$ ,  $k = 150$  extent). Peaks can be seen in the medial and ventromedial PFC (left) and ventral striatum (bottom right), among other regions. *Note.* PST = Problem-Solving Therapy; CBT = Cognitive Behavioral Therapy; PFC = Prefrontal cortex.



**Figure 3.** Generational differences in mean medial PFC BOLD signal among Asian Americans when viewing PST content over CBT content. *Note.* BOLD = Blood oxygenation level dependent; PST = Problem-Solving Therapy; CBT = Cognitive Behavioral Therapy; mPFC = Medial prefrontal cortex