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Transdisciplinary Team Science for Global Health: Case Study of The JUS Media? Programme

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Abstract

The world's most pressing health problems, such as the childhood obesity pandemic, demand creative new solutions. In this paper it is argued that psychological theories, concepts, and methods are ripe for integration with those of other disciplines to synthesize innovative transdisciplinary global health solutions. As a model, the process of blending developmental and cross-cultural psychology with health and media sciences to develop a transdisciplinary intervention for youth and families in Jamaica is described – the *J(amaican and) U(nited) S(tates) Media? Programme*. Jamaicans on the island are being inundated by the inflow of U.S. media, and those who have internalized U.S. culture and become “Americanized” via a process called remote acculturation are especially vulnerable to negative health habits promoted by U.S. media and advertising. In response, the JUS Media? Programme teaches critical thinking skills about food advertising (especially U.S.-produced) to decrease unhealthy eating among “Americanized” youth and families in Jamaica. In this paper, first, transdisciplinarity is defined and distinguished from other scientific orientations (uni-, multi-, and inter-disciplinarity) using the evolution of scholarship within JUS Media? Programme's transdisciplinary team as an example. Next, the application of transdisciplinary team science to global health problems is explained. As an example, the guiding transdisciplinary model for the JUS Media? Programme is described and the cultural adaptation process used to design the JUS Media? Programme for Jamaican families is detailed. Finally, there is a reflection on best practices for transdisciplinary team leadership and collaboration.

Keywords

Remote Acculturation; Obesity; Transdisciplinary/Interdisciplinary/Multidisciplinary; Media Literacy; Nutrition

The world's most pressing health problems such as HIV and malnutrition demand creative new solutions that "reflect the complexity of behavior and decisions in a future-oriented and global framework of responsibility" (Godemann, 2008, p. 626). Transdisciplinary (TD) team science, a cross-disciplinary approach in which "team members representing different fields work together over extended periods to develop shared conceptual and methodologic frameworks that not only integrate but also transcend their respective disciplinary perspectives" (Stokols, Hall, Taylor, & Moser, 2008, p. 35), has emerged as a promising alternative to unidisciplinary strategies in understanding and addressing such real-world problems (e.g., globalchilddevelopment.org).

In the 21st Century, the global burden of disease has decidedly shifted from communicable to non-communicable diseases (Lim et al., 2012) and high BMI is a chief rising risk factor now impacting children and families globally, which compounds other vulnerabilities in developing countries (Popkin, Adair, & Ng, 2012). In the Caribbean, this public health crisis is fueled not only by a nutrition transition from traditional to Westernized diets, but also by a psychocultural risk factor called "remote acculturation" (Ferguson, 2013) – the psychological internalization of a foreign cultural identity, values, and behaviors due to modern globalization. A recent report demonstrated that youth and mothers in Jamaica who had internalized a U.S. identity also watched more hours of U.S. cable television (TV) daily and, in turn, ate more unhealthy food (Ferguson, Muzaffar, Iturbide, Chu, Meeks Gardner, 2018). U.S. cable TV has a prominent presence in the Caribbean (Gordon, 2009) and is saturated with advertising featuring energy dense foods. Not surprisingly, heavy TV viewing has been linked to fewer negative beliefs about the consequences of eating unhealthy food (Russell & Buhrau, 2015). This multi-faceted problem called for a TD solution integrating nutritional sciences and media/advertising literacy (henceforth, media literacy) into the framework of acculturation psychology to create an effective family intervention.

Consistent with the American Psychological Association's commitment to the role of psychology in health care settings (APA Center for Psychology and Health, 2014), the purpose of this paper is to demonstrate how TD teams that integrate diverse disciplines including psychology can jointly develop and implement interventions to promote health and resilience globally. As a model, this paper describes the integration of nutrition and media literacy sciences within the framework of remote acculturation psychology to develop an intervention for youth and families in Jamaica, called the *J(amaican) U(nited) S(tates) Media? Programme* (JUS Media? Programme). To that end, this article is organized into four sections. First, there is a brief overview of the Jamaican context in terms of local nutrition, the urban media landscape, and the presence of remote acculturation. Second, transdisciplinarity is defined and distinguished from other scientific orientations (uni-, multi-, and inter-disciplinarity), using the evolution of scholarship within the JUS Media? Programme TD team as an example. Third, the application of TD team science to global

health problems is explained, introducing the TD model that guided the development of the JUS Media? Programme, and detailing the cultural adaptation process used to design the intervention. Fourth, best practices for leadership and collaboration in global TD team science are proposed by combining our experiences with recommendations from federal programs and evidence on characteristics of successful international teams.

Jamaican Context

Geography and Nutrition

Jamaica is an island in the middle of the Caribbean Sea with a subtropical climate. Its current health, education and income standards rank the island as a middle-income country with an economy largely based on tourism, agriculture, and remittances from emigrants living in developed countries (Planning Institute of Jamaica, 2016). Jamaica's population is largely of African heritage (~90%) with substantial numbers of other ethnic groups and admixtures due to a violent history involving the decimation of the original Amerindian "Taino" people by Spanish colonizers, the importation of enslaved Africans by Spaniards and later British, and the arrival of indentured laborers from India, China, and Europe after the abolition of slavery (Senior, 2003).

The many ethnic groups that make up Jamaica have resulted in foods that comprise a wide range of ingredients, cooking techniques, and spices. Indigenous and introduced food crops and animals, abundant seafood from the surrounding sea, and local livestock were once prominent in the Jamaican diet, but reliance on some imported foods, which had supported the population from the days of slavery, such as wheat flour and cornmeal, salted codfish, mackerel and meats, remained important. Traditional dishes include many obvious antecedents from African, British, Indian and Chinese dietaries (Higman, 2008). In the twentieth century, the emergence of the Rastafarian culture in particular led to a wider appreciation for natural foods, with a vegetarian focus. With increasing economic development, Jamaica has followed the global nutrition transition from traditional foods to more highly processed foods (Blake-Scarlett et al., 2013). Fast food restaurants, in particular, having proliferated physical locations to the point of market saturation, have expanded their daily offerings from lunch-snack-dinner to include breakfast times as they cater to a modern "nyam and scam" culture in urban Jamaica (i.e., eat and run; Giray & Ferguson, 2018; Richardson, 2013). Moreover, increased trade, travel, and TV and other media have made U.S. fast food franchises especially popular. Yet recent research shows that prioritizing quality family mealtimes with conversation is linked to better nutrition and emotional health in Jamaica (Giray & Ferguson, 2018).

Urban Media Landscape

Jamaica's current mass media environment presents a mix of local and global with the majority of TV content reflecting U.S. programming and advertising (Market Research Services Limited, 2014). TV came to Jamaica in 1963, one year after independence. Cable TV arrived in the 1980s, now reaching at least 55% of the population (probably higher in urban areas) (Gordon, 2009). Due to codes from the Jamaican Broadcasting Commission, the satellite feeds come directly from the United States with hundreds of channels of

programming and advertising intact (Gordon, 2009). Cable TV provides an unregulated one-way flow of content from the United States into Jamaica, and the same exact programs and advertising viewed in the United States are viewed in Jamaica. Food advertising is prominent in Jamaica, and promotes largely unhealthy options. A recent analysis of food advertisements in newspaper and outdoor advertising in the capital city, Kingston, revealed the predominance of energy dense foods such as processed foods, snacks, soda, and fast-food restaurant offerings (Nelson, Ahn, Giray, Ferguson, 2017). Kentucky Fried Chicken (KFC) was found to be the most frequent advertiser.

Remote Acculturation

The westernization of nutrition in Jamaica and the drenching of the island in unregulated U.S. media inflows reflect a dramatic change in the cultural landscape of Jamaica, and are linked to a modern form of acculturation coined “remote acculturation” by Ferguson and Bornstein (2012). Remote acculturation is the psychological internalization of a geographically and historically distant culture following indirect and/or intermittent exposure to this culture (in this case, U.S. culture) by non-migrants in another culture (Jamaica), resulting in changes in one’s behaviors, identities, and values. The United States exerts the strongest external cultural influence on Jamaica through U.S. tourists, imported U.S. goods, Jamaica-U.S. transnationalism (back-and-forth migration and sustained phone/Internet contact), and U.S. cable TV and other media on the island.

Remote acculturation towards U.S. culture while living in Jamaica is a type of psychological “Americanization” (per colloquialism in Jamaica), an aspect of indigenous Caribbean psychology (Ferguson, 2016). This phenomenon was first documented quantitatively in a 2012 study of adolescents and mothers in Kingston. Ferguson and Bornstein (2012) categorized 33% of youth and 11% of mothers as “Americanized Jamaicans” (vs. culturally “Traditional Jamaicans”) based on moderate affinity for European American (i.e., White American) culture blended with a strong affinity for local Jamaican culture, less traditional family values, larger parent-adolescent gaps in traditional family beliefs, and more parent-adolescent conflict. A subsequent replication and expansion study showed that Americanization was positively associated with watching more U.S. TV and less Jamaican TV, and with consuming more U.S.-style fast food such as KFC (Ferguson & Bornstein, 2015). Qualitative focus groups further revealed that mothers viewed healthy food as linked to Jamaican culture and unhealthy food as linked to U.S. culture (Ferguson & Iturbide, 2015). They also described how convenience and time constraints influenced their food choices, making U.S.-style fast food increasingly common despite health concerns.

Summary

Taken together, an examination of the current Jamaican context indicated that Jamaicans on the island are being inundated by U.S. media, and those who *internalize* U.S. culture are especially vulnerable to health habits promoted by U.S. advertising, including unhealthy eating. These insidious interconnections among nutrition, media use, and remote acculturation highlighted the need for a TD approach to future research and intervention in Jamaica. It seemed plausible that since U.S. media use presents a health problem for

Americanized Jamaicans on the island, then U.S. media literacy could be part of the solution.

Transdisciplinarity Team Science

Definition

Addressing complex societal issues such as obesity prevention and globalization of diets calls for the creation of TD teams. Transdisciplinarity is a “problem-focused, contextualized, and consultative” approach to research and intervention (Wickson, Carew & Russell, 2006, p. 1047), and when this approach is applied to collaborative research in a group of scholars it can be considered TD team science (i.e., not all team science is TD, and transdisciplinarity can inform the work of a single scholar).

Before a more in-depth discussion of transdisciplinarity, it is important to note that most scholars agree that transdisciplinarity can be distinguished from alternative orientations to team science including unidisciplinarity, multidisciplinary, and interdisciplinary (See Table 1). Unidisciplinary teams stay within a single discipline, whereas multidisciplinary teams comprise researchers from different disciplines who work in parallel or in sequence with each other, each retaining his/her respective disciplinary perspectives on the research addressing a common theme. Interdisciplinarity introduces joint research of scholars from different disciplines through an interactive process, but each continues to draw from his/her respective disciplinary approaches. In contrast, transdisciplinarity generally involves an integrative process whereby researchers work together to extend concepts and measurements across two or more disciplines to create new models that address a real-world problem (Stokols, et al., 2008).

Moreover, these four scientific approaches need not be mutually exclusive categories (Klein, 2008). Ideally, there is flexibility to allow several pathways to integration, and it is not uncommon to utilize a combination of multi-, inter-, and TD approaches with different emphases at different phases in a given team’s collaboration. Indeed, scholars of TD team science repeatedly point out that it is often difficult to ascertain clear distinctions between inter-disciplinary and TD teams in real time as the evolution of the collaborative team process to reach a new conceptual framework takes time (Klein, 2008). To underscore this point, Table 1 chronicles the history of the JUS Media? Programme team, showing how members utilized all four scientific orientations across time, evolving from uni- and multidisciplinary approaches to interdisciplinary ones, and now into a TD program.

Key Characteristics

There is fair consensus, though not unanimity, around three key characteristics of transdisciplinarity: *problem focus*, *evolving methodology*, and *collaboration* (see Wickson et al., 2008). This section describes each using the JUS Media? Programme as an example. First, TD research is geared towards engaging with complex, multidimensional *real-world problems* (rather than conceptual problems confined within a single discipline, which is more the case in unidisciplinarity) and intentionally frames these problems based on “their manifestation in the world as we experience it (i.e., in society, in the environment)”

(Wickson et al., 2008, p. 1048). Rising rates of obesity and non-communicable disorders are of great societal concern in Jamaica (Jamaica Gleaner, 2018) and the Caribbean (www.healthycaribbean.org), and unhealthy eating is a priority action by Caribbean heads of government (www.carpha.org). Further, prior qualitative research in Jamaica shows that mothers view unhealthy eating to be linked to Americanization (Ferguson & Iturbide, 2015), and quantitative findings show that Americanization and U.S. TV watching are correlates of unhealthy eating (Ferguson et al., 2018).

Second, TD research is characterized by *evolving methodologies* versus static, bounded ones (more characteristic of the other three scientific orientations). Evolving methodologies are constructed from an integration of different disciplinary methodologies and possibly disciplinary epistemologies (unlike unintegrated methodologies in multidisciplinary), and they are dynamically adjusted in an iterative process to meet contextual conditions as the research process unfolds in the real world (Wickson et al., 2008). For example, in developing the JUS Media? Programme, the TD team originally planned on including a media creation exercise (to make an advertisement for a healthy food like carrots) that had been used successfully in a food-focused media literacy intervention for U.S. primary school children. However, after careful discussion between the advertising scholar and the developmental cross-cultural psychologist of how this methodology might work with early adolescents in the Jamaican context, which values cultural critique and resistance of oppression, it was decided that the intent of the exercise (i.e., to foster critical thinking skills about food advertising) would be better achieved if families created a counter ad to an existing food advertisement.

Intentional *collaboration* with stakeholders and the broader community being served on problem definition to research strategy is the third key characteristic of TD research (Wickson et al., 2008). Thus, TD collaboration goes beyond the collaboration between scientists at the team's core (which also characterizes interdisciplinary team science). For example, before developing the JUS Media? Programme, the lead researcher met with stakeholders in Jamaican schools (i.e., students, teachers, administrators, cafeteria managers) to share basic research findings regarding the intertwining of unhealthy eating with media use and Americanization in Jamaica, and to solicit their input on a desired target and method of intervention.

Application of TD Team Science to Global Health

Applying TD team science to global health requires an ecological perspective. The conceptual model guiding the development of the JUS Media? Programme integrates acculturation psychology, media literacy, and nutrition sciences. The resulting TD intervention promotes principles of media literacy including empowerment and subversive advertising to address the association between remote acculturation and nutrition. The overarching conceptual model is based on an ecological approach to understanding dietary habits and obesity prevention (Fiese, Bost, McBride, & Donovan, 2013; Harrison et al., 2011). From this perspective, eating behaviors are embedded in larger ecologies that include exposure to food advertising, adolescent identity, family habits surrounding food, and national policies that include regulation of TV and support for healthy diets. A key aspect of

this ecological approach is the assumption that culture provides a regulatory function in terms of diet and health. The types of food passed down across generations are embedded in cultural traditions and availability of foods in particular regions. Applied to the JUS Media? Programme, it was important to consider the intersectionality of individual preferences, exposure to media, and local cultural context.

In order to accurately assess each domain, it was crucial to include investigators with expertise in adolescent identity formation, food advertising, and family influences on diet; an understanding of the Jamaican national policies that affect food marketing and endorsement of healthy diets in the schools; and an appreciation of the cultural influences on health. Thus, our TD team was formed to include experts in adolescent development, culture, family routines, food advertising, program evaluation, and Caribbean nutritional sciences. In addition, interviews were conducted with stakeholders to ensure that local knowledge was incorporated.

Empirical Research Supporting a TD Global Health Model for Use in Jamaica

Built on this TD model, the first empirical study to examine the associations among Americanization, U.S. cable TV viewing, and eating habits of families outside the U.S. was conducted in Jamaica (Ferguson et al., 2018). Bioecological systems theory was used, specifically the Process-Person-Context-Time model (Bronfenbrenner & Morris, 2006), to conceptualize how proximal reciprocal interactions among mothers and adolescents (people), and U.S. cable TV (objects) in the home setting can be key drivers of development of nutritional choices (see Figure 1). A unique benefit of this theory for the study was its explicit embedding of the home microsystem within broader contexts whose effects influence behaviors in the home. Of particular relevance for remotely acculturating families in Jamaica, there are not one but two major macrosystems influencing eating habits: the local Jamaican cultural norms regarding nutrition and the U.S. cultural norms regarding nutrition now embodied in the “Western diet”.

Cross-sectional questionnaires assessing self-reported remote acculturation (operationalized as one’s enjoyment of and identification with European American culture), daily U.S. Cable TV viewing (in hours), and frequency of consuming unhealthy foods (e.g., fast food, sugar-sweetened beverages) were completed at a single time point by 330 adolescents and their mothers from Kingston secondary schools. Actor-partner interdependence modeling mediation using structural equation modeling was used, and socioeconomic status was included as a covariate. Findings revealed that adolescents’ and mothers’ Americanization was positively associated with their own daily U.S. cable viewing and the frequency of their own unhealthy eating. Furthermore, for girls’ mothers and boys, U.S. cable TV viewing acted as a mediator between their Americanization and their unhealthy eating, whereas the model with Americanization as mediator was not supported. For girls, however, it was their mothers’ U.S. cable TV hours, not their own, which was linked to their unhealthy eating. Although directionality/bidirectionality between remote acculturation and U.S. cable viewing could not be concluded without longitudinal data, there was better support for the explanation that Jamaicans who have remotely acculturated to the U.S. culture selectively consume more U.S. media. Taken together, findings supported the development of the

conceptual TD model and highlighted U.S. media engagement as a potential intervention target given its role as a proximal predictor of unhealthy eating. Moreover, results suggested that both adolescents and mothers should be considered for prevention/intervention, which was consistent with the prevailing consensus and recommendation for obesity prevention both in the United States and globally (see Barlow, 2007; <http://www.who.int>; www.cdc.gov).

Steps to Develop a TD Global Health Intervention: JUS Media? Programme

Step 1: Seek community feedback on research findings and their priority for action.—As mentioned, the TD team leader (Author 1: Jamaican-born psychologist) sensitively presented pilot study findings (i.e., from the collaborative interdisciplinary study with Author 4: see Table 1) at each participating school in Jamaica to solicit feedback. Stakeholders, many of whom were also mothers, resonated with the findings and pointed to the slick and memorable food advertising on U.S. cable and in U.S.-styled local Jamaican ads as a driving force. They also highlighted time and budgetary constraints working mothers face in providing healthy family meals. Individuals at all schools expressed more interest in group-based (versus individual) intervention efforts, and suggested a competition component. Thus, efforts were directed towards short food-focused media literacy workshops for groups of students and mothers.

Step 2: Identify partners who share the vision and form the TD team.—The TD team leader (Author 1) then set out to identify potential partner(s) who possessed the requisite disciplinary skills in media literacy (Author 3) and would share or catch the vision for creating this new TD intervention. Enthusiasm for the underlying conceptualization/organizing framework (i.e., remote acculturation) was crucial, as partners who shared a common ontology, epistemology, and worldview of research contribute to synergistic team science (Ponterotto, 2005). Further, local stakeholder buy-in was essential to sustainability and dissemination. Thus, additional team members with prior TD and community partnership development experience were added. Our process of team formation aligned with best practices in the science of team science literature including: an optimal team size of six to nine core participants with mixed academic rank; members who valued collaboration and had a history of collaborative projects; incorporation of face-to-face meetings; attendance at conferences together which built trust; and co-mentoring of students (Hall et al., 2018).

Step 3: Capitalize on the body of scientific knowledge to inform the TD intervention.—The JUS Media? Programme team harnessed scientific knowledge in psychology and media literacy as a foundation for the intervention. Historically, social psychology forms the basis for the understanding of advertising and media effects (Ross & Richards, 2008). The Persuasion Knowledge Model (PKM: Friestad & Wright, 1994) holds that knowledge is power and the more knowledge that people have about how persuasion works from various socialization forces including parents, teachers, peers, and media, the better able they are to cope (e.g., ignore, counter argue) with a persuasion attempt. This model has been used to understand and predict how children, adolescents, and adults develop and respond to persuasion attempts (e.g., Boush, Friestad, & Rose, 1994). Media

literacy is “the ability to access, analyze, evaluate, create, and act using all forms of communication” (<https://namle.net/>). Because advertisers spend large amounts on advertising to children and adolescents (<https://www.ftc.gov/>), and there is international evidence that exposure to food advertising can alter food-related beliefs (Russell & Buhrau, 2015) and consumption of the food (e.g., Boyland & Whalen, 2015), media literacy can be considered one form of persuasion knowledge (Nelson, 2016).

A media literacy intervention is an education program “designed to reduce harmful effects of the media by informing the audience about one or more aspects of the media, thereby influencing media-related beliefs and attitudes, and ultimately, preventing risky behaviors” (Jeong, Cho & Hwang, 2012, p. 454). The theoretical assumption is that by instilling knowledge, the participants can better counter-argue or practice resistance against the unwanted media effects. A meta-analysis of 51 media literacy interventions show that these interventions improve media knowledge and criticism, as well as beliefs and behaviors (Jeong et al., 2012).

U.S.-based media literacy intervention. A food-focused media literacy intervention based on the PKM theoretical framework and conceptual definition of media literacy was developed and tested by Author 3 in a three-hour curriculum in a U.S. primary school (Nelson, 2016). The curriculum, *Making Media for a Healthier U (MMHU)*, focused on teaching eight to ten year-old children about nutrition and media literacy. The curriculum was delivered by classroom teachers to six third-grade classes over a three-week period. Results of the field experiment showed that relative to control classes, students in the intervention group showed significant increases in media literacy understanding (e.g., message source, persuasive strategy, target audience: Nelson, 2016) as well as nutrition knowledge (Nelson & Kehr, 2016).

Step 4: Create/adapt the TD intervention.—Nelson’s (2016) MMHU school-based U.S. intervention was adapted to create the family-based JUS Media? Programme for 7th grade students and their mothers in Jamaica. Cultural adaptation refers to the “systematic changes made to a protocol so that features of the culture and language [and context] of particular groups are considered as part of the treatment,” and is a way to avoid unnecessary reinventions of the wheel by “building on treatments that have demonstrated efficacy [as] a sensible starting point” (Bernal & Domenech Rodriguez, 2012, p. 4 & 13, respectively). Cultural adaptation grew out of the multiculturalism movement in psychology beginning in the late 1980s and its central purposes are to promote ecological validity of interventions by ensuring an intervention is well-suited to its delivery context, and to decrease health disparities across ethnocultural groups (Bernal & Domenech Rodriguez, 2012). Cultural adaptations can involve 1) surface changes (also called presentation strategies), which are minor modifications such as changes in language and race/ethnicity of persons pictured, and/or 2) deeper structural changes (also called content strategies), which are major modifications to the foundational cultural values, audience (e.g., child to family format) and so on (Barrera, Castro, Stryker & Toobert, 2013). See Table 2.

The JUS Media? Programme was designed as a two-session workshop for consecutive weekends with supplementary text/SMS messages to reinforce learning and encourage

behavior change in the following two months. Session 1 of the Programme retained typical components of media literacy interventions including information-delivery, analysis of media, and hands-on activities with an easy multiple-choice understanding check after each segment (e.g., Greene et al., 2016). Additionally, a media creation homework assignment was designed for use between Session 1 and Session 2 with the products to be entered into a contest in Session 2. A contest was chosen based on local community desire and the fact that competition has been shown to increase adolescent involvement and interest in media literacy curricula (Greene et al., 2016). SMS messages were added to extend the benefits of the Sessions in a cost-effective manner.

First, Session 1, “Healthy Eating in Jamaica,” reminds participants about government standards for nutrition using the Food Based Dietary Guidelines for Jamaica developed by the Jamaica Ministry of Health (<http://moh.gov.jm>). Second, Session 1 highlights the ubiquity and multiple forms of U.S. advertising messages in Jamaica, with a focus on food and beverages. Imagery of U.S. brands in local media and markets, and more subtle persuasion efforts such as product placement in U.S. cable TV shows or brand efforts in social media and advergames, are highlighted. Third, Session 1 introduces the concept of remote acculturation and showcases pilot study findings that Americanized Jamaicans, who have a stronger affinity for U.S. culture, are at greater risk for unhealthy eating (using the local terms “Jahmericans” or “Mixed-Culture Jamaicans” found in previous studies). Fourth, Session 1 introduces families to media literacy principles (e.g., evaluating and creating messages) and components (understanding message source and purpose, target audience, and common persuasion tactics). Local examples are highlighted (e.g., images of multiple Burger King ads around Kingston to demonstrate the persuasion tactic of “repetition”) and evidence is provided (e.g., regarding “targets”, research is presented showing how U.S. fast food companies specifically target Black and Hispanic youth and how soda companies specifically target low/middle income countries: e.g., see Rudd Center for Food Policy and Obesity, 2015). Interspersed throughout are food advertisements for analysis and discussion.

Localization. To localize, a Jamaican international sports celebrity, sprinter Usain Bolt, was selected to reference in Session 1 because these types of spokespersons are influential in persuasion, especially for adolescents (Dixon et al., 2014). A visual depicting Usain Bolt’s balanced daily diet filled with protein, carbohydrates, fruits and vegetables is shown (Loria et al., 2016), and a video clip of him discussing the struggle of cutting out junk food is used to illustrate the difficulty of instilling changes. Later in the presentation, it is shown how Bolt uses his celebrity to endorse several brands, including Gatorade with a Twitter feed.

Interactivity. Intended for a mixed group of adolescents and mothers working at small tables, fun interactive activities were created by U.S. investigators and Jamaican research assistants, who included a former teacher and multiple mothers. For example, after the nutrition segment, a food plate image is used as a starting point to “plan a healthy dinner meal at home.”

Culture Jamming as Critical Media Literacy: “Let’s Subvertise”. Beyond evaluation and analysis, creation and production are also important aspects of media literacy (Potter, 2010). Whereas the U.S. MMHU intervention encouraged children to create advertising for

carrots (Nelson, 2016), the JUS Media? Programme hands-on activity was tailored to the developmental stage and cultural context of its audience (7th graders/12 year olds and mothers). Early adolescents have more mature social-cognitive development and consumer socialization (i.e., the “reflective stage”) than younger children (John, 1999). There is also a shift in orientation toward more critical thinking and reasoning (John, 1999), capabilities which were targeted and enhanced by the JUS Media? Programme through an exercise called “Subvertising.” Subvertising derives from the words ‘subvert’ + ‘advertising’ and is the practice of making fun of ads by transforming the message into commentary or parody of the product, brand or idea. Subvertising is a kind of “culture jamming”, “the appropriation of a brand identity or advertising for subversive, often political, intent” (Carducci, 2006, p. 116). And of course, adolescents tend to enjoy spoofing and mocking. Research in social psychology and developmental science supports this – adolescent interventions are more likely to succeed when they respect adolescent autonomy and treat them with higher status than children by inviting them to discover information rather than telling them what to do (Yeager, Dahl, & Dweck, 2018).

The critical and creative nature of subvertising also fit well within Jamaican values of cultural critique, resistance of oppression, and self-empowerment (Ferguson et al., 2016). To explicitly cue this set of cultural values, this section of Session 1 began with a popular quote from Bob Marley’s 1980 Redemption Song “Emancipate yourself from mental slavery”, where the ubiquitous advertising and slick persuasive principles were equated to a kind of mental slavery.

The final segment of Session 1 introduces the principles of subvertising demonstrated by a singing subvertisement created by a U.S. early adolescent. A supplementary 7–10 minute small group activity then allows adolescents and mothers to subvertise a popular soft drink print ad and share their ideas with the larger group. This production-practice-performance sequence is a successful way to solicit interaction in small and large groups. Next, a subvertising homework is explained whereby adolescent-mother pairs (1) choose an ad; (2) critique or think deeply about the messages in the ad; and (3) uses any medium to change the original ad into a parody ad that makes fun of the deceptive messages. Session 2 comprises focus group-style discussions where participants explain their subVERTISEMENTS and the media literacy principles they used in creating them as a way to reinforce concepts from Session 1. All subVERTISEMENTS are then shown for voting by families, not researchers, and winning families receive certificates and tangible gifts.

Step 5: Refine the TD intervention.—After intensive program development work, it is important for a core team to step back and invite other eyes to critically examine the content and packaging. One of the major benefits of TD international team science is the ease of harnessing necessary emic and etic perspectives across disciplines and cultures from within the team. The JUS Media? Programme team exploited this strength by involving all research assistants and investigators in both countries in reviewing materials to ensure cultural appropriateness, acceptability, clarity of key ideas, and locally resonant wording. Suggestions at this step are not expected to change major concepts forming the backbone of the intervention, but to make minor revisions (e.g., trimming content), and to inform delivery (e.g., best presentation ‘hooks’ for the local Jamaican audience). Multiple mock

presentations were delivered via Skype and then in person with both U.S. and Jamaican project personnel throughout this refinement process.

Step 6: Pilot and evaluate the TD intervention.—Piloting the intervention could take many forms with the gold standard approach being an efficacy study with random assignment to intervention versus control groups in a modest but sufficiently powered sample. There are multiple desirable outcomes from an intervention such as the JUS Media? Programme including increases in food-focused media literacy, decreases in unhealthy eating, or increases in healthy eating or nutrition knowledge. Importantly, this intervention does not intend to change individuals' remote acculturation but rather to buffer its impact on health habits. Therefore, some potential future directions might include national media campaigns; community-based efforts linking parents, schools, and public health officials; and school-based curricula to raise awareness about media literacy.

TD Team Leadership and Collaboration

With the growth of TD teams to address public health challenges, the U.S. National Institutes of Health has developed a field guide for team scientists (Bennett, Gadlin, & Levin-Finley, 2010). The U.S. Institute of Medicine has also proposed guidelines for enhancing the effectiveness of team science (Cooke & Hilton, 2015). There are several commonalities across these recommendations including adopting a clear vision for the project, establishing means for resolving conflicts, addressing geographic dispersion, and coordination of communication efforts to facilitate task efficiency. As a complement, Google's recent research findings resulting from 200+ interviews with over 180 active teams outlined characteristics of the most successful teams: dependability, structure and clarity, meaning, impact, and most importantly, psychological safety (i.e., freedom to take risks within the group: Rozovsky, 2015). These characteristics were reinforced in a special issue of the *American Psychologist* (e.g., Hall et al., 2018).

During the first year of the JUS Media? Programme teamwork, a core set of values, which align with the above principles, were adopted to reflect the mission and vision of the team: optimism, determination and commitment; teamwork, cohesiveness, effective communication and mutual respect; gratitude and caring; and excellence and efficiency. These core values are evident in monthly team meetings as well as in email correspondence (e.g., the first agenda item for team meetings is typically "Appreciation & Announcements," which serves to celebrate team members' accomplishments and recognize largely unseen hard work, while being informative).

In order to create open lines of communication and reduce opportunities for conflict, a formal agreement regarding publications and presentations was made amongst all team members. Clearly stated expectations for data use, author contribution criteria, and acknowledgement statements were provided, and there was an agreement to pursue both local and global presentation opportunities. Each proposal is sent to the principal investigator for approval so all investigators and students can track publications/presentations under review or in press.

A central characteristic of TD programs is the opportunity to educate the next generation of researchers who may adopt new perspectives and create a new body of knowledge (Cooke & Hilton, 2015; Stokols et al., 2008). Accordingly, the JUS Media? Programme team actively engages undergraduate, graduate, and postdoctoral fellows from the collaborating institutions in both countries in its work. Further, recognizing that strong institutional support is a necessary condition for success (Hall et al., 2018), the host institution is home to several TD projects including a doctoral training program (Keck et al., 2017) and a large birth cohort study addressing obesity prevention (Bost, Teran-Garcia, Donovan, Fiese, & STRONG Kids Team, 2018; Musaad, Donovan, Fiese, & the STRONG Kids2 Research Team, 2018).

TD Team Leadership for International Teams

Although many of the best practices for TD teams derived from North American research and experience are likely to also apply for international teams, some assumptions may not hold due to cultural differences across team members (Feitosa, Grossman, & Salazar, 2018). TD team approaches that are cross-culturally beneficial include establishing/reinforcing team identity to increase trust (e.g., adopting JUS Media? core values), instilling cultural intelligence and fostering group norms to boost team effectiveness (e.g., JUS Media? publication agreement), and using virtual tools to de-emphasize differences across members (Feitosa et al., 2018). As an example of the latter point, it is imperative for the JUS Media? TD team to have reliable support for virtual collaboration. Monthly team meetings are held via a video conferencing program so that all team members can be visually present. Additionally, secure and confidential online file-sharing is facilitated by the TD team leader's institution. At least annual in-person meetings are also held to promote trust and strengthen collaborative relationships that are difficult to build on virtual encounters alone; these alternate between countries involved (U.S., Jamaica).

However, Feitosa et al.'s (2018) review also highlighted North American best practices for team science that do not hold cross-culturally largely due to differences in individualism-collectivism (the U.S. being highly individualistic), and recommended culturally responsive approaches to optimize team effectiveness for international TD teams. For example, rather than assume that direct conflict-resolution is needed when problems arise, or that open whole-team conflict discourse is the best conflict-resolution strategy, international TD team leaders should seek to understand the culturally endorsed methods used in each member's cultural group. If it is determined that conflict management is needed, then the TD leader should decide whether a direct discussion or an indirect approach would be better. Another cross-cultural difference is that a leadership style which tries to empower subordinates (i.e., enhance autonomy, self-management, self-confidence, and accountability) will not necessarily make the team more effective if it contradicts the hierarchical collectivistic culture norms of some members.

Overcoming challenges

Challenges are inevitable in TD global health teams and projects because the work requires innovation, meaning both creative idea generation *and* implementation, and significant ambidexterity is needed to manage the tension between these two poles of divergent (for

creativity) and convergent processes (for implementation) (Thayer, Petruzzelli, McClurh, 2018). Nonetheless, researchers are encouraged to view these quandaries as “exciting new challenges” rather than obstacles (Wickson et al., 2006, p. 1052). Chief among those challenges is that of knowledge integration across multiple dimensions required in TD teams including the integration across disciplines, theory and practice, as well as scientist and community perspectives. For global TD teams, yet another dimension of integration must be accomplished: integration of perspectives across nations/cultures represented on the team and communities being served. Thus, cultural brokering (Kam & Lazarevic, 2014) is a critical skill for global TD team leaders to facilitate real-time translating and bridging across these multiple dimensions. There is also the challenge of reflection (Wickson et al., 2006) meaning for TD team members to have both personal reflexivity about their own frames of reference, values, and assumptions, and disciplinary reflexivity whereby members routinely “consider [discipline] A in light of B and vice versa”. This is a way to continuously reshape the team’s created knowledge to best apply it to their specific research project and context. Team debriefs also facilitate reflexivity, collective sensemaking after team events (to decrease ambiguity and reconcile interpretations, which support group learning), and psychological safety (Allen, Reiter-Palmon, Crowe, & Scott, 2018).

Unresolved paradox is a final major challenge in TD team science; TD researchers need to be able to thrive in the context of certain ambiguities by thinking creatively. For example, a major paradox related to the JUS Media? Programme is that remote acculturation and an Americanized lifestyle in Jamaica bring both liabilities (e.g., unhealthy habits) and assets (e.g., time-saving convenience, family entertainment) to families. The JUS Media? Programme team resolved this paradox by representing remote acculturation as a double-edged sword and encouraging families to maximize its benefits while minimizing its liabilities through balance and moderation (e.g., balancing your daily food plate versus total avoidance of certain foods).

The JUS Media? Programme team also experienced many logistical challenges including preparing and coordinating submissions and approvals from IRBs in multiple countries, internet connectivity problems during virtual team meetings, administrative delays in transfer of needed funds across international partners, and discontinuities caused by mentorship/supervision across borders. There is an ever-present need to demonstrate flexibility, negotiation, willingness to pitch in on varied tasks, and above all, cultural intelligence and humility (Feitosa et al., 2018).

Conclusion

The world’s most pressing health problems such as the childhood obesity pandemic demand creative new solutions. This article provided an example of how the integration of multiple disciplines using a transdisciplinary approach (blending cross-cultural and developmental psychology with health and media sciences) allowed one international team to address an important global health issue (unhealthy eating) by collaboratively developing a TD intervention – the JUS Media? Programme. This innovative and multi-faceted solution to promoting healthy eating among Americanizing youth and families would not have been

possible using a multidisciplinary approach nor without strong institutional support for TD team science.

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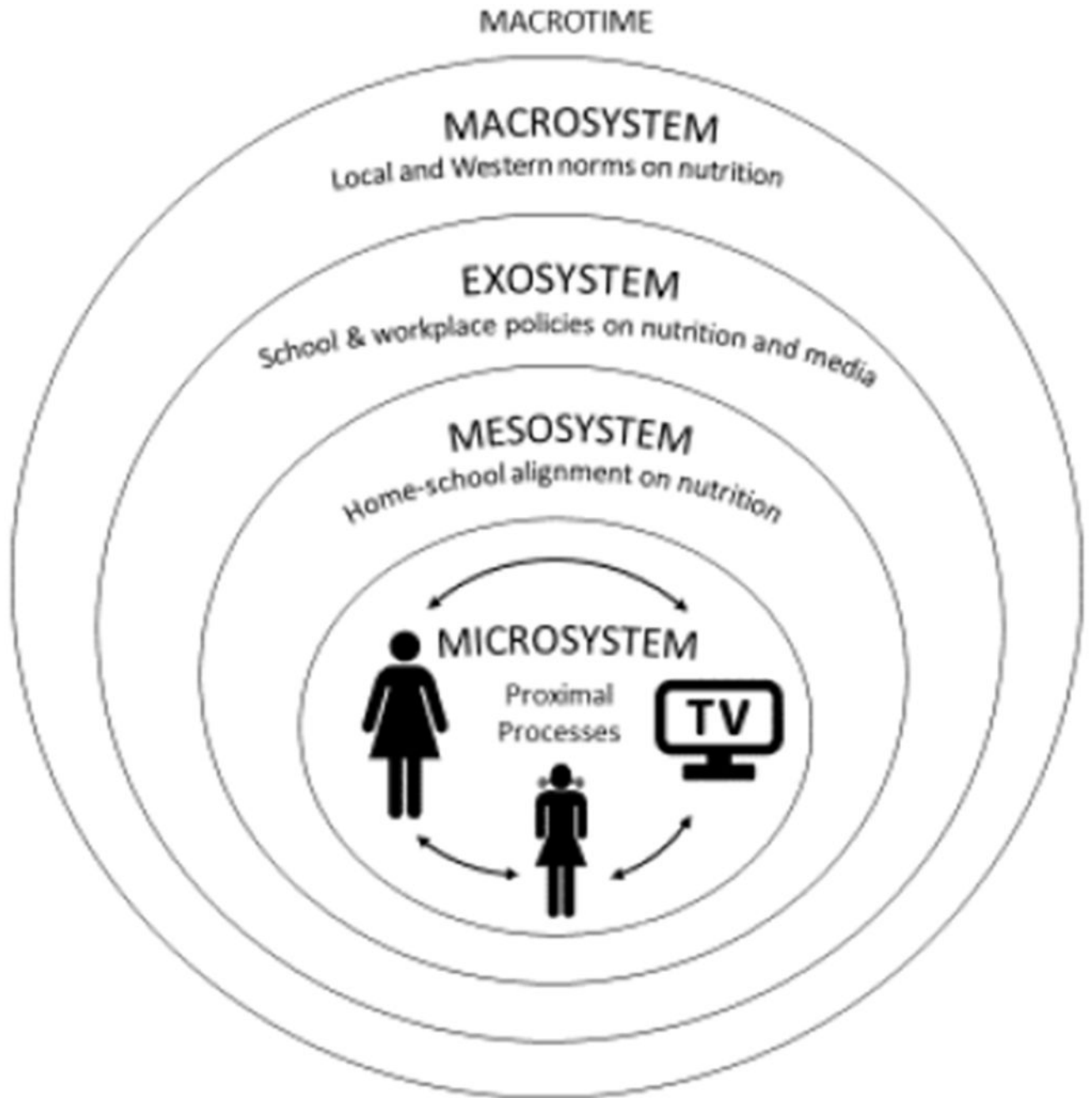


Figure 1. Conceptual Bioecological Systems Model or Process-Person-Context-Time Model Illustrating how Nutritional Development of Adolescents and Mothers in the Jamaican Home is Shaped by U.S. Cable and other Proximal and Distal Contexts
Note. Microsystem *proximal processes* of reciprocal interactions between people (particularly mothers and daughters) and objects (particularly, US cable TV) in the Jamaican home drive nutritional development of remotely acculturating individuals. These proximal processes in the microsystem are influenced by broader systems of *context* including the

mesosystem, exosystem, and macrosystem, all of which are uniquely shaped by this moment in historical *macrotime* characterized by rapid globalization in developing countries via technology & trade. Reprinted with permission from Ferguson et al. (2018). Adapted from Bronfenbrenner and Morris (2006).

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Table 1
Comparative Table of Definitions and Examples of Scientific Orientations in Team Science

Scientific Orientation ^a	Definition	Example from the JUS Media? Programme Team Formation
Unidisciplinarity	“A process in which researchers from a single discipline work together to address a common research problem.”	<ul style="list-style-type: none"> Grounded in the discipline of psychology (cross-cultural and developmental), Author 1 and her collaborators pioneered theory and research on remote acculturation, to highlight the psychological and identity implications of modern globalization for youth and parents. This scholarship on “Americanization” first began among youth and parents in Jamaica, then expanded into the wider Caribbean and Africa (Ferguson & Bornstein, 2012 & 2015; Ferguson, Désir, & Bornstein, 2014; Ferguson et al., 2016; Y. Ferguson, K. T. Ferguson & G. M. Ferguson, 2017; K. T. Ferguson, Y. Ferguson, & G. M. Ferguson, 2017). Grounded in the discipline of advertising, Author 3 developed and empirically validated a food-focused media literacy intervention for primary school children in the United States (Nelson, 2016).
Multidisciplinarity	“A sequential process whereby researchers in different disciplines work independently , each from his or her own discipline-specific perspective, with a goal of eventually combining efforts to address a common research problem.”	<ul style="list-style-type: none"> Grounded in their respective disciplines, Author 1 (psychology), Author 3 (advertising), and Author 4 (nutrition) and their research labs collaborated as a team to carry out independent sequential research. The team empirically documented family mealtimes in Jamaica (Giray & Ferguson, 2018), surveyed the food-related media landscape in Jamaica (Nelson, Ahn, Giray, & Ferguson, 2017), and reviewed the available literature on Caribbean nutrition and dietary practices (Stennett, Meeks Gardner, & Ferguson, 2017), respectively. This laid the groundwork for later integration of findings in the transdisciplinary phase to inform the development of the JUS Media? Programme.
Interdisciplinarity	“An interactive process in which researchers work jointly , each drawing from his or her own discipline-specific perspective to address a common research problem”	<ul style="list-style-type: none"> Grounded in the discipline of nutrition, Author 4 collaborated with a team – the Global Child Development Group – spanning a wide range of other disciplines including child development, epidemiology, medicine, and economics. Members worked interactively using their discipline specific perspectives to answer the research questions of multi-authored manuscripts in two <i>Lancet</i> series (2007 & 2011) comprising 5 papers on developmental outcomes of children in low- and middle-income countries, otherwise known as developing countries (see globalchilddevelopment.org; Walker et al., 2007). Author 1 (psychology) and Author 4 (nutrition) and their disciplinary collaborators, supplemented by brief consultations with Author 3 (advertising) and another media scholar, conducted a collaborative study to investigate the interrelations among remote acculturation, nutrition, and media use among youth and parents in Jamaica (Ferguson et al., 2018). Conceptual and methodological decisions pertaining to the research design derives from each discipline, and this team proposed a bioecological systems model of the links among remote acculturation, hours of media use, and unhealthy eating.
Transdisciplinarity	“An integrative process in which...team members representing different fields work together over extended periods to develop and use a shared conceptual and methodological framework that synthesizes... extends, [and transcends] discipline-specific theories, concepts, methods, or all three to create new models and language to address a common research problem [grounded in a real-world problem]”.	<ul style="list-style-type: none"> Author 2 and colleagues across other disciplines jointly developed a transdisciplinary MPH/PhD training program with a focus on obesity prevention (Keck et al., 2017), a multi-site transdisciplinary undergraduate research program, (Friesse, Hammons, Teegarden, 2018), and headed large transdisciplinary cohort studies to address the complex origins of childhood obesity (Bost, et al., 2018; Musaad et al., 2018). For Author 4 and the Global Child Development Group, in some papers, new models were created to answer real world problems (e.g., with respect to the development of models to understand the economic costs of not achieving developmental potential). Based on prior team findings in Jamaica and local stakeholder consultations regarding desired next steps, media literacy was identified as a proximal intervention target to address the real-world problem of unhealthy eating in Jamaican families. This issue was of great concern to the general society and scholars alike. Wanting to develop a cross-disciplinary food-focused media literacy intervention (the JUS Media? Programme), Author 1 (psychology) sought out Author 2 (transdisciplinary expertise), who suggested inviting Author 3 (advertising/media literacy) to collaborate with herself and Author 4 in an in-depth integration and extension of theories, findings, and methods across media literacy, remote acculturation, and nutrition, in order to create this new intervention. To better inform the development of the JUS Media? Programme, this

Scientific Orientation ^a	Definition	Example from the JUS Media? Programme Team Formation
		transdisciplinary team also initiated a collaborative research project to map the media and food landscapes in Jamaica in the context of widespread remote acculturation.

Note:

^aDefinitional quotes derive from Stokols et al. (2008, see Table 1, p. S79) with minor adaptations by other scholars in square brackets.

Table 2

Summary Of Changes Made In The Cultural Adaption Of The “Making Media For A Healthier U” Curriculum For U.S. Children To Create The “JUS Media? Programme” For Jamaican Families

Surface Feature Changes (Green light adaptations ^a)	
Peripheral Strategies ^b (<i>Modify observable properties to overtly convey relevance to the group</i>)	Declarative intervention title containing ethnocultural group name (i.e., Jamaican) Color scheme of Jamaican Reggae colors (i.e., black, green, gold, and red) Black models with Caribbean styling (e.g., warm climate apparel; Caribbean hair styles)
Linguistic Strategies ^c (<i>Alter language used to maximize comprehensibility</i>)	Use of Jamaican Creole ^c (e.g., “Can’t tek Mummy fi fool!” instead of “Can’t trick Mom!”) Use of local phrasing (e.g., “Third World country” was preferred to “Developing country”)
Constituent-Involving Strategies ^d (<i>Use cultural knowledge and experiences of cultural group members</i>)	Use of local celebrities (e.g., video of Jamaican Sprinter Usain Bolt describing his diet) Using photographs of local advertising and food environment (e.g., local billboards, local grocery stores, local fast food restaurant chains)
Other green light adaptations	Make activities more interactive (e.g., have students and mothers work together to subvertise a print ad for 5 minutes during Session #1)
Deep Structure Changes (Yellow light adaptations)	
Evidential Strategies ^e (<i>Use evidence/data from target cultural group and similar groups to increase perceived relevance</i>)	Replace USDA “MyPlate” U.S. visual nutritional guidelines (www.choosemyplate.gov) with the Jamaica Ministry of Health “Food Plate” recommendations (http://moh.gov.jm) Presentation of research findings regarding Jamaican nutrition, known health benefits of healthy eating (e.g., physical, emotional, academic), and known health problems associated with unhealthy eating (including overweight, obesity, hypertension, etc.) Present research evidence that U.S. fast food advertisers disproportionately target Black and Hispanic youth (Rudd Report, 2015) and soda companies target developing countries
Sociocultural Strategies ^f (<i>Recognize, reinforce, and build upon cultural values, beliefs, and behaviors</i>)	Present remote acculturation as an indigenous feature of the psychology of Jamaicans using quantitative and qualitative research findings from prior studies among students and mothers in Jamaica Reference Jamaican cultural values of resistance and self-empowerment as motivation to deconstruct and subvert unhealthy media messages in U.S. food advertising (e.g., use Bob Marley’s lyrics “Emancipate yourself from mental slavery” as entrée into subvertising) Promote the Jamaican cultural value placed on family by incorporating both students and their mothers in workshops, fostering family communication through joint homework, and using family love as a motivator for mothers to provide healthy food for their children Addition of a workshop activity where small groups assemble a healthier meal order from a local fast food menu in recognition of the cultural practice of eating at a fast food restaurant on Friday nights/weekends Replace some U.S. ads used to demonstrate persuasion tactics of advertisers with popular fast food ads shown in Jamaica which appeal to local families’ value of family, drive for academic achievement, and national pride

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Other yellow light adaptations

Modification of media literacy “create” component: instead of creating a new ad for a healthy product (e.g., make an ad for carrots), re-create a fast food ad (e.g., make a parody of a popular soft drink ad) by subvertising it

Incorporate the stages of change model as a way to conceptualize gradual and manageable change towards a nutrition/health goal

Adjust language and presentation style from 3rd grade-level to a 7th grade level to suit both students and mothers

Delivery by trained research team in non-school setting versus school teachers at school

Rejected Changes (Red light adaptations)

Alter key aspects of the program which will weaken the evidence-based program effectiveness

- X** Shorten total program time to reduce participant burden (instead, the JUS Media? Programme chunked 9 brief curriculum lessons into 2 longer workshop sessions)
- X** Remove the “create” component of the media literacy training to reduce time burden (this component was retained as an essential piece of the definition of media literacy, but it was made more fun through formatting as a subvertising competition in Session #2)

Note:

^aFrom U.S. Department of Health and Human Services Making Adaptations Tip Sheet (<https://www.acf.hhs.gov/>)

^bList of strategies based on Barrera et al., (2013), Kreuter & Wray (2003), & U.S. DHHS Making Adaptations Tip Sheet (<https://www.hhs.gov/>).

^cEnglish is the official language of Jamaica and it is commonly interlaced with the local Creole, derived from a blend of English, African languages, and other influences.