

**Assessing the Impact of Theatre-Making on Individual Behavioral Change: Applied Theatre
and Healthy Eating**

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This project was supported in part or in whole by an award from the Research: Art Works program at the National Endowment for the Arts: Grant# 15-3800-7016.

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Abstract

This award supported the evaluation of a pilot study employing a participatory theatre program designed to promote healthy eating behaviors among elementary school students in a community whose demographics are linked to a higher risk for obesity-related diseases. The study, involving a curriculum combining cooking lessons with culturally informed participatory theatre activities, was developed and delivered in 2015, as were various instruments designed to assess and evaluate its effectiveness. All evaluation and assessment activities were based on a theoretical model developed by the researchers prior to the study, which links elements of participatory theatre to factors known to influence individual attitudes and behaviors.

This report describes the larger study and its three principal findings: first, that participatory theatre activities were linked to an increase in self-efficacy around healthy eating, which is a pre-condition for individual behavioral change; second, that this increase was most closely associated with the elements of emotional arousal, modeling and repetition introduced in the participatory theatre activity; and third, that the principal instrument developed for tracking the presence and quality of participatory theatre and related engagement activities worked in the aggregate, but requires further refinement for closer tracking to individual attitudinal and behavioral change. Based on our findings, we include recommended data collection for future studies employing participatory theatre activities toward the promotion of individual behavioral change.

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Executive Summary

This award supported the evaluation of a pilot study employing a participatory theatre program designed to promote healthy eating behaviors among elementary school students in a community whose demographics are linked to a higher risk for obesity-related diseases. Over the course of six weeks, researchers and teaching artists delivered an innovative curriculum combining cooking classes with culturally informed participatory theatre activities, aimed at helping Latina/o fifth graders understand and adopt healthy eating ideas and behaviors. We were interested in studying the effects of such a combined curriculum on students' attitudes and beliefs about healthy eating, and to better understand the causal pathways linking the participatory theatre elements to factors understood by health scientists to be intermediaries to individual change.

At the heart of the analysis is a theoretical model illustrating, in a very holistic way, the relationships between the elements involved in making theatre together with those involved in changing one's beliefs, attitudes, and behaviors (see Figure 1). The concentric rings of our model move inward—from outer circles of theatre-making, through a middle ring of mediators to individual change, and on to the individual at the center. It is thus a model of *individual change*, but we recognize that individuals do not exist in isolation, and that both individual and community wellness is at heart a social justice issue.

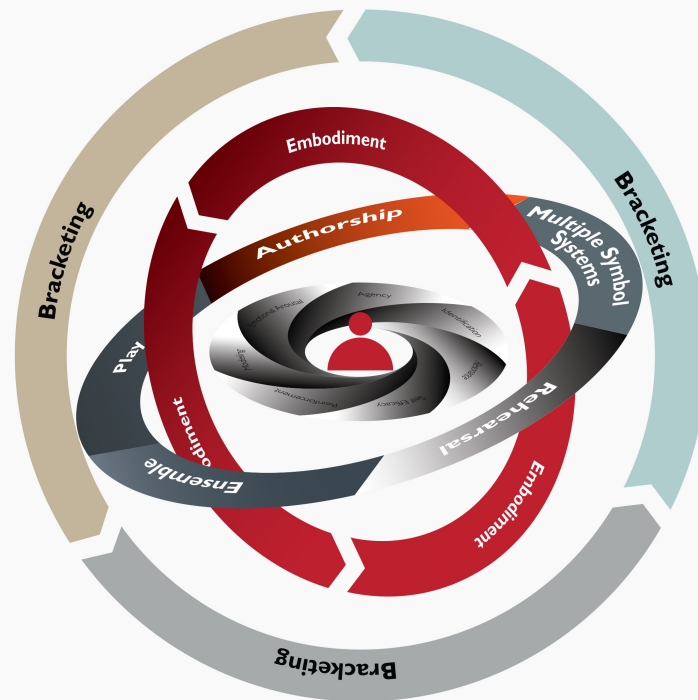


Figure 1. “How Theatre-Making Works.” The outer three orbits refer to elements associated with participatory theatre activities, whereas the inner ring refers to intermediary factors associated with change at the individual level. Our research explores the “gravitational pull” among these orbits.

In this model, the outer ring, Bracketing, indicates the process framing all theatre-making practices: the separation between theatre-making and real life. Here, activities such as risk taking, role-playing, physical expression, manipulating established relationships between sign and referent, even identity itself can morph and transform in ways they cannot in real life. The second ring lists what we consider as the *sine quibus non* of theatre-making: **authorship, manipulation of multiple symbol systems, rehearsal, ensemble, and play**, which we developed using research in drama pedagogies and applied theatre, creativity and play theory, and theatre theory and

criticism. Following this ring is Embodiment, which refers to a key aspect of all the categories in the second ring, offering a fuller range of sensory engagements and the potential for serving multiple learning styles— cognitive, physical, affective, visual, aural, and so forth.

Embodiment also serves as bridge to the attributes of inner ring, the key components of an individual's psycho-social processes known to be causally linked to culturally relevant learning processes and behavior changes. These are intermediary outcomes toward behavior change in two senses: they occur along the way to behavioral change, *and* they act as mediators to the process itself. They include **self-efficacy, reinforcement, modeling, emotional arousal, agency, resonance,** and **identification**. Put simply, self-efficacy is the conviction that one has the personal ability to perform behaviors that produce desired outcomes. Thus, no matter how compelling the message is, and no matter how much a person might agree with it, if s/he doesn't believe in his or her own personal capacity to do what's necessary to make the change, change will not happen. Reinforcement refers both to rewards and punishments, and also to the mastery over time of something new through repetition. Agency refers to the capacity to exert one's influence on behalf of oneself and/or others, in individual and social contexts. Modeling refers to the importance of other people and their observed behaviors in individual learning. Emotional arousal here refers specifically to positive emotions such as joy, interest and contentment, which can broaden an individual's thought–action repertoires and build their enduring personal resources, thus contributing to actions that lead to optimal health. Finally, the elements

of cultural resonance and identification have been shown by researchers on the effects of narrative – here expanded to include embodied story-making – as influential on attitudes, beliefs and behaviors.

Our study was designed to help us understand the “gravitational pull” associating these components across their various orbits, particularly as they relate to helping young people move in the direction of adopting healthy eating behaviors. Thus we collected both qualitative and quantitative data from the six-week workshop activities. The qualitative dataset consisted of transcripts of daily journal entries by two teaching artists, teaching session field notes generated by two independent participant-observers trained in systematic observational methods, and daily journal entries using guiding questions completed by student participants. The quantitative dataset consisted of daily frequency checklists, numerical scores of student responses derived from daily student journal entries, a demographic questionnaire, and 5 validated scales administered twice to students of a 5th grade classroom (n=26, primarily Latina/o and African American), using a within-groups pretest-posttest design. The demographic questionnaire (delivered in English and Spanish) asked age, gender, birthplace, language use and race/ethnicity. The 5 scales assessed Healthy Lifestyle Behaviors, Healthy Lifestyle Beliefs, Perceived Difficulties in pursuing healthy lifestyles, Healthy Eating Beliefs, and Self Efficacy.

Our principal findings are threefold: first, that participatory theatre activities were linked to an increase in self-efficacy around healthy eating, which is a pre-condition for individual behavioral change; second, that this increase was most closely

associated with the elements of emotional arousal, modeling and repetition introduced in the participatory theatre activity; and third, that the principal instrument developed for tracking the presence and quality of participatory theatre and related engagement activities worked in the aggregate, but requires further refinement for closer tracking to individual attitudinal and behavioral change. Part of this is due to the complexity of the intervention itself and the difficulty in tracking multiple students working both individually and collectively; we address this in more detail in the report. We learned a great deal from the delivery and assessment of our curriculum in regard to appropriate research methods for observing and then characterizing the nature of participatory theatre activities so that the essential elements can be operationalized. Our suggestions and recommendations are included in the Final Report.

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Introduction/Statement of Problem

In a nutshell, our study employs and tests a new theoretical model designed to think through the underlying mechanisms linking participatory theatre-making to individual attitudinal and behavioral change, toward the future development of research-based measures of theatre components that may help researchers quantify and evaluate the nature of these individual theatre-making components and their relationship to change. In this particular study, we are concerned most with individual change among young people most at risk for obesity-related diseases.¹

Cultivating healthy habits while young can yield lifelong benefits, which is why so many health education and promotion programs are designed to help young people establish those habits early on. Many such programs zero in on diet and exercise, since “early interventions” in these areas can help prevent a host of other kinds of problems later in life, especially those related to obesity (e.g., type 2 diabetes, heart disease, high blood pressure, osteoarthritis, stroke, and some kinds of cancer). But obesity remains a problem, particularly in some communities of color. Among all US American adults age 20 and over, more than 68% are considered by the National Institutes of Health to be

¹ Initial funding for this research has come from the Institute for Humanities Research and Herberger Institute for Design and the Arts at Arizona State University.

overweight or obese, a figure that jumps to more than 76% among Hispanics and blacks (NIH/NDDK 2012, based on data from 2009-2010).

As artists and scholars working at the intersections of culture, nutrition, arts, and health science, the authors have, since 2012, been working to learn more about whether—and if so how—cultural and artistic engagements might amplify the effects of health promotion programs. Borrowing the Spanish word for dinners, *cenar*, for our working group “**Cultural Engagements in Nutrition, Arts, and Sciences**,” we develop, implement, and evaluate innovative approaches to healthy eating at the individual and community level, with arts practices at the center.² The study we discuss in this report grew out of our own prior activities, as well as from field-specific research in applied theatre and health promotion and psychology. It is based on research showing that culturally attuned, participatory theatre-making, with its promise of demographically appropriate, whole-body/mind involvement in exploring issues both familiar and strange, can indeed enhance more traditionally delivered forms of health education and promotion (such as classes, textbooks, etc.).

Before turning to a review of this prior research, a few definitions are in order. First, by “culturally attuned,” we refer to programs and interventions that take seriously the culture of origin of the participants, going beyond home-language to consider other cultural pathways, including food. Socio-cultural contexts shape diets; for example Szurek (2011) found that despite knowledge of healthy eating, the degree of ethnic

² The CENAS team comprises the three authors, university-based researchers respectively in community cultural development, medical anthropology and theatre, in collaboration with performing artist and cook Robert Farid Karimi, also known as “The People’s Cook.”

diversity of one's friendships could predict the degree of unhealthy eating behaviors; while Liburd (2003) found that unless the ritualistic aspects of eating and food selection were addressed, diabetes patients saw changing their dietary practice as antithetical to their ideas of sociality. These studies show clear links among cuisine, identity, cultural location (defined both geographically and historically), leading health researchers to apply the concept of culture in settings designed to reduce health disparities (see also Singer 2012).

We might argue also that "youth" itself constitutes a kind of cultural location, both independent of and related to ethnic origin and other demographic markers. Studies focusing on changing youth health behaviors recognize that youth can and should be studied as effective social agents with worldviews, social rules, and patterns of social interaction that can develop and operate distinctly from those of adults (Chipeniuk 1995; Hirschfeld 2002; James 1998; Zarger and Stepp 2004). The more successful of such programs aim to reach youth in the language of what is increasingly coming to be known as "youth culture," and in spaces outside the traditional school setting – via content-delivery systems like YouTube or texting, for example, and in settings where youth normally gather together (like community youth centers or after-school programs) (Nichter and Medeiros 2011).

By "participatory theatre-making" we refer to the *active process of making theatre together* in a group, rather than to the more conventional forms of watching theatre on a stage, performed by other people. Examples of the latter for our purposes include "nutritional plays" put on by health insurance/managed care corporations like

Kaiser Permanente or nutrition education organizations like FoodPlay. Such plays harness the power of theatrical narrative to deliver information about nutrition, health, exercise, and so forth, and take as their principal concern the innovative and engaging delivery of information about healthy eating.

However, when it comes to nutrition, knowledge does not necessarily equal power over one's eating habits (Rizor and Richards 2000). That is one reason why, especially in regard to equipping young people with more such power, new models facilitating the work of youth themselves are becoming an important modality. Participatory theatre-making offers one such approach. This practice goes by a variety of names (process drama, theatre for development, theatre for education, popular theatre, transformatory theatre, or the broader terminology of community cultural development and community-based arts); and is based on the premise that communities making their own theatre are more actively engaged in identifying and exploring what is needed to create change in their own lives (McCammon 2007, Sloman 2012). In participatory theatre, young people don't just watch a performance, they make one together, which may or may not then be shared with a larger public. They manipulate the elements of theatre – which we identify as bracketing, play, multiple symbol systems, authorship, ensemble, rehearsal, and embodiment – to express their experience, imagine healthy alternatives, and embody and rehearse new habits-in-the-making. Facilitators of this process proceed from an understanding of children and youth as assets and agents in their communities and competent producers of culture in their own right (Etheridge Woodson 2015).

For the past five years, the CENAS team has been developing curricula that blends cooking classes with participatory theatre, assessing the efficacy of this combined approach on attitudes toward healthy eating among ethnically diverse adolescents, allied health practitioners and community health workers. Our early research indicated such an approach was promising in helping to shift attitudes in a healthful direction, and has added to a growing number of impact studies and position statements on the value of incorporating the arts into health education and promotion (Winham et al. 2014; see also Clift 2012, Putland 2008, Staricoff 2004, and White 2009).

While many studies, ours included, document and describe the results of such artistic “interventions,” fewer have concerned themselves in a systematic way with studying the underlying causal mechanisms linking creative practice (i.e., making art, including theatre) to the outcomes sought and/or achieved. Fewer still offer a theory of change which isolates the distinct causal pathways between theatre-making and individual behavioral change. Agreeing with Raw et al. (2012) that such work would provide a better “basis for understanding and accepting the findings of impact studies” (98), we undertook in this new study to generally test our theory about how theatre participation links to the development of healthy attitudes and behaviors, this time with a group of Latina/o and African American fifth-graders. Our model of “How Theatre Making Works” in the context of individual attitudinal and behavioral change synthesizes research from diverse fields: our team’s various disciplinary backgrounds in theatre and performance practice and studies, as well as theories of individual learning and change prevalent in educational philosophy, social psychology and health

promotion literature.

Prior Research: Participatory Theatre and Health

Because our study's focus is primarily on participatory theatre-making, as described above, we limit our research review to that slice of the larger body of research on the effects of arts on and in health and well-being.³ As McCammon summarizes, most research on such theatre, conducted under the umbrella term "theatre and social change," is "framed through the lens of critical theory and critical pedagogy, which was strongly influenced by the writings of Paulo Freire and Augusto Boal" (2007: 947). Indeed, much of the work applying theatre to health happens in the developing world, but even in the so-called developed world, health is increasingly understood to have social as well as medical determinants; theatre, both participatory and more traditional, has been used to build awareness of both structural constraint and individual agency for a wide variety of health conditions and contexts (see Low and

³ For meta-studies surveying such effects, see Starikoff (2004), who correlated various arts practices with positive outcomes for patients in recovery from a wide variety of medical procedures and surgeries, as well as for cancer, cardio-vascular, and neonatal intensive care patients receiving in-hospital treatment; she also noted positive effects of arts experiences on staff job satisfaction, education and training. Boydell et al.'s 2012 scoping review considered how arts-based approaches can thicken the texture and quality of qualitative research on health beyond serving as mere supplements to traditional forms of data collection and dissemination, instead presenting different ways of knowing. As their titles suggest, *Arts & Health: An International Journal of Research, Policy and Practice* and the *Journal of Applied Arts and Health* are both focused on research involving arts in the domain of health, broadly construed. In the main, where there is empirical research it tends focus on the results and the nature of evidence for arts efficacy; Raw, et al. (2012) call for a shift to a focus on underlying mechanisms involved. That is the principal aim of our study here, within the realm of participatory theatre. .

Baxter 2017).

However, McCammon also points out that many practitioners of such theatre are informed as much by their own personal and practical knowledge as they are by critical theory, and are motivated by a belief in theatre to effect positive change on participants and audiences (949). As a result, there have been several collections and numerous individual case studies describing a wide spectrum of participatory and applied theatre in a variety of domains, largely devoted to description, taxonomy, and methodological considerations, rather than to empirical research.⁴

For an overview of practice and research in which participatory theatre has been applied within the field of health education and promotion, broadly understood, the recent work of Baxter and Low (2017) is particularly useful. Low describes four principal categories in which theatre has been so applied:

1. Theatre meant to help educate about health issues
2. Theatre made in response to specific health issues
3. Theatre-making as a therapeutic modality
4. Theatre as a form of arts-based research (to enhance data collection and interpretation) (Introduction)⁵

Within this growing body of research from within the field of applied theatre, empirical

⁴ In addition to McCammon 2007, see Hughes and Nicholson 2016; Nicholson 2005; Prendergast and Saxton, 2016; Prentke and Preston 2009; Taylor 2003; Thompson 2003; and Vettrano and Linds 2015; as well as the journals *RIDE: The Journal of Applied Theatre and Performance* and *Applied Theatre Research*)

⁵ For an introduction to and overview of applied theatre as a research methodology, see O'Connor and Anderson 2015.

studies relating theatre to health promotion and education are rare. This is in part due to a pervasive reluctance among theatre practitioners to “medicalize the arts” in too instrumentalist a way (leading Low to distinguish between “arts in health,” where aesthetic experience is foregrounded, and “arts for health,” in which patient outcomes matter more than aesthetic quality). Those empirical studies that do focus on effect and impact tend to be based on theatre-watching rather than theatre-making, and on short-term knowledge acquisition and communication strategies rather than long-term attitudinal or behavioral change; the majority of them come from the realm of theatre for development and are not necessarily designed specifically to increase awareness about healthy eating (although sustainable practices for food security is an important theme; see Bamutakri 2014, and Etherton and Prentke 2006).

While we take seriously the concern about overly medicalizing our theatrical practice, the CENAS team nevertheless believes that not only is it worthwhile to study whether theatre making *has* an effect on individual attitudes, beliefs and behaviors – and if so, for how long – but also to understand *how* those effects come about. We agree with Raw et al., who argue that “As long as the mechanisms remain a mystery, any evidence of impacts will fail to contribute to the field gaining the status which advocates desire it to have” (2012: 98). Our review of the literature reveals a loud silence on that last question: there is a near-total absence of studies offering a theory of change that might isolate any distinct causal pathways between theatre-making and individual effects. To begin to address this gap, we have developed a theoretical model offering a possible explanation of how theatre-making works to create individual change.

Before turning to that model, a brief review of the relevant literature on individual change from the disciplines of educational philosophy, social psychology and health promotion is in order.

Prior Research: How Individuals Change

From the health promotion, education and psychology literature, we have identified four principal characteristics of the most successful programs aimed at individual behavioral change, especially in the arena of nutrition and healthy eating. First, such programs are interactive and developmentally appropriate; they intervene at multiple levels, and address more than the cognitive domain alone (Bandura 2007; Contento 2007; Katz 2009; Stead et al. 2011). Second, as we mentioned in the Introduction, programs that take ethnic and cultural factors into account tend to be more effective than “one size fits all” programs (Dressler 2004; Economos 2012; Fisher et al. 2007; Larkey and Hecht 2010). Third, empowering young people to make their own decisions have been shown to foster positive attitudes and behaviors (Thonney and Bisogny 2006; Wrieden et al 2007). Finally, many such programs tend to follow the tenets of Social Cognitive Theory (SCT), developed by Stanford psychologist Albert Bandura, which focuses on the interplay among personal factors, the environment, and behaviors, rather than on individual psychological motivation or cognitive mastery (Bandura 2007).

These insights from other fields align well with the values inherent in participatory theatre-making. At its best, participatory theatre is fundamentally interactive, combines multiple modes of expression, and involves more than the

intellect.⁶ It has the ability to engage, entertain, and communicate complex information in an accessible manner. It may allow for nuanced cultural tailoring, and it can attend to the hidden, emotional and cultural aspects of experience (Cheadle et al. 2011; Colby and Haldeman 2007; Elliott et al., 1996; Perry et al., 2002; Rossiter et al., 2008; Wilson 2009).

For the past five years the CENAS team has been researching the efficacy of such theatre in shifting participants' beliefs about healthy eating, in partnership and collaboration with The People's Cook and performing artist Robert Farid Karimi. As we report elsewhere (Winham, et al., 2014; Etheridge Woodson et al., 2017), our research has centered on workshops led by Karimi, which combine cooking classes with theatre-making activities revolving around personal and communal stories framed through devised performance, communal eating and spoken word. The cooking focuses on a plate method called VSP (vegetable, starch, protein), which emphasizes increasing vegetables to 50% of the plate, and limiting servings of animal proteins and carbohydrates each to 25% of the plate.⁷ Over our multiple years' partnership, we have conducted residencies with community health workers and their children or

⁶ For a discussion on the risks of too neatly separating intellect from affect, as well as of overly privileging affect over reason in applied theatre, see Baxter and Low 2017, Chapter 2.

⁷ Nutritionist Avril Greenberg introduced Karimi to the Idaho Plate Method, which is associated with improved carbohydrate distribution and glycemic control and weight loss (Raidl et al, 2007). It is easy to teach and easy for individuals to grasp as it relies on visual assessment rather than more complicated measuring of portion sizes. See <http://thepeoplescook.com/resources/>.

grandchildren, adolescent students in a school setting, festival and farmer's market pop-up events, primary students in a school setting, and tertiary nutrition students in a commercial kitchen. On each occasion we used mixed methods approaches that pulled from both qualitative and ethnographic protocols as well as quantitative instruments from the allied health and social cognitive fields (Etheridge Woodson et al., 2017).

Prior to undertaking the study described in this report, our research had suggested that a combination of cooking and playing together links positively to increased consumption of fruits and vegetables, more open attitudes toward trying new foods, and feelings of self-efficacy in health-related attitudes and behaviors (Winham et al., 2014; Etheridge Woodson et al., 2015). However, before we could test this hypothesis fully in a robust comparative study, we needed to know more about the internal formal and psychosocial dynamics of theatre-making itself, and how we believe they relate to health promotion interactions. To begin, we took a closer look at several related theories of individual change: social cognitive theory (SCT), developed by Stanford psychologist Albert Bandura; Martin Fishbein and Icek Ijzen's work on the theory of reasoned action (TRA) as well as later iterations known as the theory of planned behavior (TPB); and Larkey and Hecht's (2010) model of the effects of narrative as culture-centric health promotion:

Social cognitive theory posits that individuals learn behaviors, including foundational behaviors, through observing others, taking in and making personal meaning of these observations, and eventually acting on them. Predicting and designing learning then depends on complex interactions between three

mutually dependent variables: environment, cognition/behavior and social factors. From social cognitive theory we take (and at times modify) the notions of *self-efficacy*, *reinforcement*, *agency*, and *modeling* (all described in more detail below). The theory of reasoned action (or planned behavior) is a predictive model of behavior change “determined by a combination of people’s intentions to engage in that behavior and their perceptions of control over the behavior. Intentions, in turn, are held to be predicted by attitudes towards the behavior, subjective norms (perceived social pressure) and perceived behavioral control” (Povey and Conner 2000, 121). From this theory we take the component of *emotional arousal* as relevant to the study of the relationship between theatre-making and behavioral change. Finally, Larkey and Hecht’s model of the effects of narrative suggests that certain elements of storytelling—expanded here to include theatrical devising—are more likely than others to influence attitude, belief and behavior changes in health promotion contexts. From their model we are particularly interested in *cultural resonance* and *identification*, which we have seen in our experiences with The People’s Cook Project to elicit the richest materials for both learning and collaboration, since the elements emerge from the participants’ experiences rather than being imposed on them from outside. (Etheridge Woodson et al., 2017).

Onto these factors we have mapped the key elements of participatory theatre-making to suggest how the latter might amplify the former to bring about individual

change. Those elements, described in more detail below, are: bracketing, authorship, manipulation of multiple symbol systems, rehearsal, ensemble, play, and embodiment.

Our Theoretical Model

The concentric rings of our model move inward—from outer circles of theatre-making, through a middle ring of mediators to individual change, and on to the individual at the center. It is thus a model of *individual change*, but we recognize that individuals do not exist in isolation, and that both individual and community wellness is at heart a social justice issue (Sallis et al 2006; White 2006).

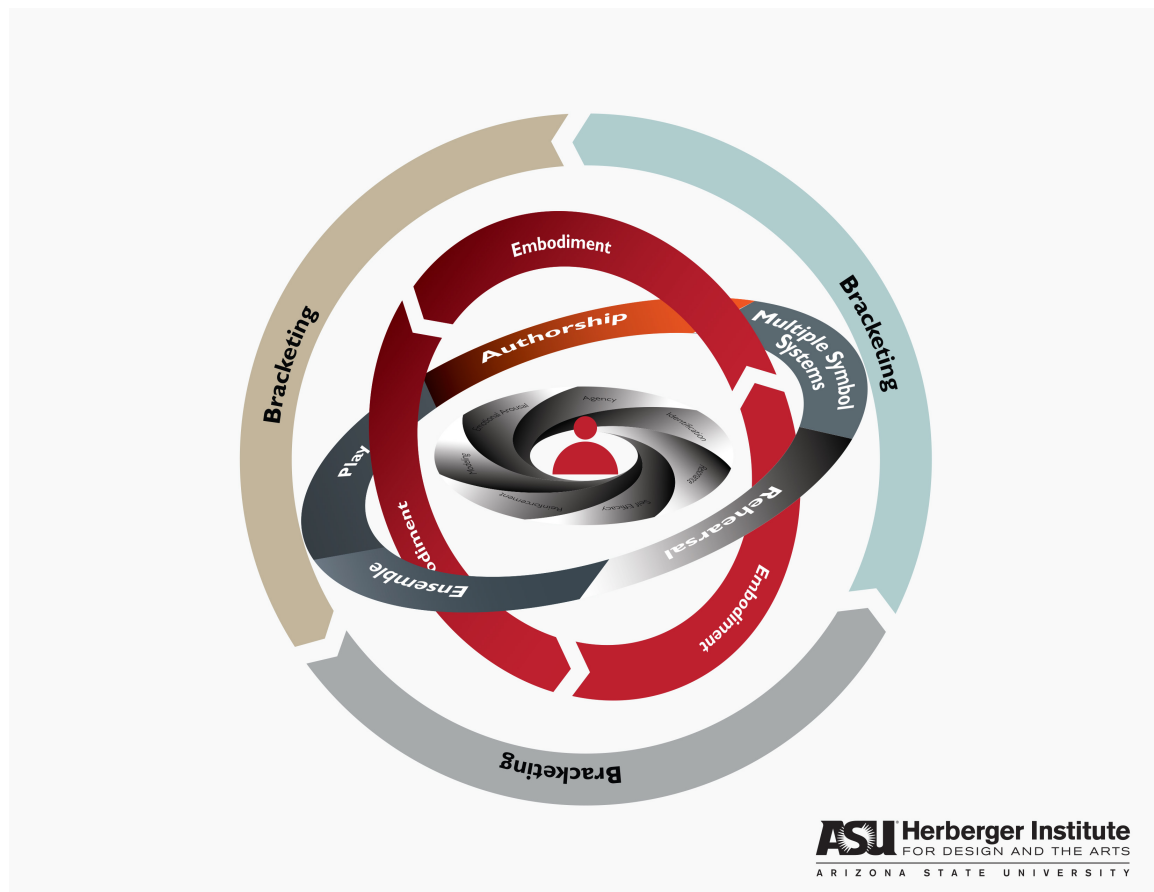


Figure 1. “How Theatre-Making Works.” The outer three orbits refer to elements associated with participatory theatre activities, whereas the inner ring refers to intermediary factors associated with change at the individual level. Our research explores the “gravitational pull” among these orbits.

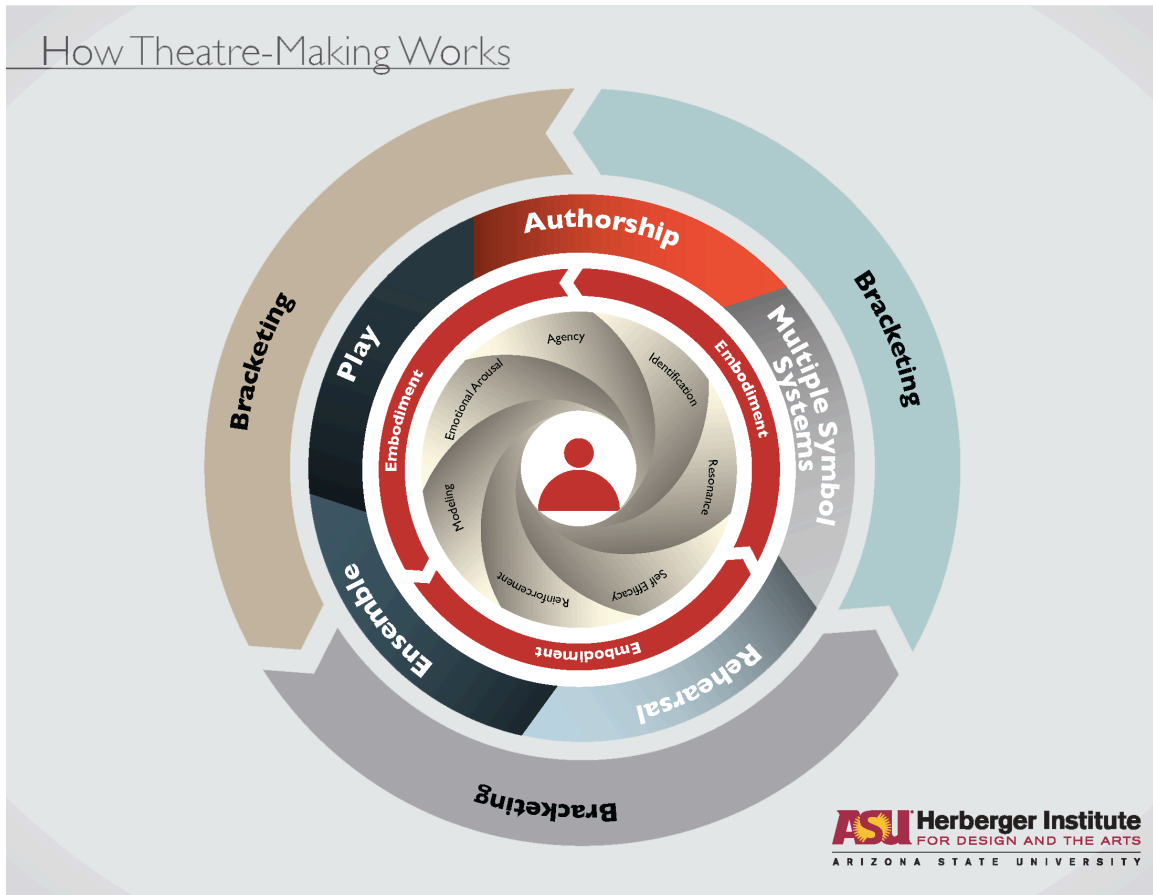


Figure 2. Reproduced in two dimensions for readability.

Further, we see the individual rings of the model as both mobile, and mobile in three dimensions: the categories in each ring are not meant to line up with those of the other rings in a static way. In Figure 2, we show it in two dimensions for ease of reading.

The outer ring, Bracketing, indicates the process framing all theatre-making practices: the separation between theatre-making and real life. Here, activities such as risk taking, role-playing, physical expression, manipulating established relationships between sign and referent, even identity itself can morph and transform in ways they cannot in real life. The second ring lists what we consider as the *sine quibus non* of theatre-making: **authorship, manipulation of multiple symbol systems, rehearsal,**

ensemble, and **play**, which we developed using research in drama pedagogies and applied theatre, creativity and play theory, and theatre theory and criticism. Following this ring is Embodiment, which refers to a key aspect of all the categories in the second ring, offering a fuller range of sensory engagements and the potential for serving multiple learning styles— cognitive, physical, affective, visual, aural, and so forth (one could start with Aristotle’s *Poetics* for reference; see also Jackson 2011; McCammon 2007; Sawyer 2003; Schmeck 1988; and States 1985). It is also of growing interest to the fields of the medical humanities and health psychology as well, particularly as biomedical paradigms rooted in a Cartesian mind/body split have come under increasing scrutiny. Medical humanists have employed notions of embodiment to call for more nuanced understandings of the lived experiences and social meanings of “enworlded” bodies (Leder 1984; Jaye 2004), while health psychologists have begun to recognize that “a focus on the relationship between bodily experiences and health-related cognition can bridge the gap between psychological and medical research traditions,” which is of particular value for encouraging preventive health behaviors (Ghane and Sweeny 2013 (S1), 159).

Embodiment also serves as bridge to the attributes of inner ring, the key components of an individual’s psycho-social processes known to be causally linked to culturally relevant learning processes and behavior changes. These are intermediary outcomes toward behavior change in two senses: they occur along the way to behavioral change, *and* they act as mediators to the process itself. They include **resonance**, **self-efficacy**, **reinforcement**, **modeling**, **emotional arousal**, **agency**, and

identification. In the next sections, we describe the research and theories grounding the second and innermost rings, and how we understand the relationship between them.

Theatre-Making Elements:

Play is a multidimensional concept, encompassing the act of playing, playfulness and the traditional theatrical understanding of dramatic script and performance (Pellegrini 2009; Sutton-Smith 2009; Turner 1982). Play relates to many of the other categories in this ring, and can make possible several intermediary outcomes in the second ring as well, especially emotional arousal, modeling, and reinforcement. In collaborative play and theatre-making, all participants have the ability to contribute to the making of the performances.

We define *authorship* here then as active structuring and playful negotiation (devising) of performance and embodied narrative based on the collective stories and cultural/social mores of the participants. The embodied participation and contribution to the unfolding dramatic process influences all the components of learning and behavioral change in the inner ring.

Theatre-making engages multiple symbol (or meaning-making) systems: words, objects, images, music, movement, sounds, etc. This allows for multiple learning styles to be honored, and creates positive conditions for the intermediary elements of emotional arousal, resonance, and reinforcement.

We define *rehearsal* as the collective, reflective and recursive engagement of material through various cycles of creativity. In rehearsal, participants play and explore material, stories, attitudes and emotions using multiple symbols and through embodied

form. As individuals repeatedly move through the creative cycle, they inhabit the spaces of both audience and actors, simultaneously creating work and reflecting on those creations. Rehearsal allows us to try new things, creates safe spaces for risk-taking and lets us see and experiences the consequences of our choices. As such, it is distinctly related to the intermediary outcomes of modeling and reinforcement.

Finally, *ensembles* are collectives performing together, communities built of trust and the ability to communicate quickly and effectively. Strong ensembles build deep levels of embodied communication and perceptual sensitivity, or what communication theorists label interactional synchronicity. Interactional synchronicity contributes to an ensemble's ability to improvise together, manipulate symbol systems collectively and move through creativity cycles. Ensemble makes possible many different intermediary outcomes, notably emotional arousal, agency, reinforcement, and modeling.

Intermediate Outcome Elements.

From social cognitive theory we take the notions of self-efficacy, reinforcement, agency, and modeling. Put simply, self-efficacy is the conviction that one has the personal ability to perform behaviors that produce desired outcomes. Thus, no matter how compelling the message is, and no matter how much a person might agree with it, if s/he doesn't believe in his or her own personal capacity to do what's necessary to make the change, change will not happen. Reinforcement refers both to rewards and punishments, and also to the mastery over time of something new through repetition. Agency refers to the capacity to bring "one's influence to bear on one's own functioning

and environmental events” (Rimer and Glanz 2005). Modeling refers to the importance of other people and their observed behaviors in individual learning.

What can theatre-making do to enhance self-efficacy, reinforce new learning and support youth in becoming agents of their own health? First, SCT research has shown that mastery experiences are the most important factor in increasing self-efficacy, and the theatre-making process is quite well aligned with promoting and reinforcing it, especially within the bracketed space of rehearsal. Second, SCT also stresses the importance of social and coping models, whereby participants see people like themselves doing new things, confronting and overcoming challenges to change. It is one thing to show such models; it is another entirely to rehearse them oneself, to try out various solutions within the group, and to test them in the safe space of play. Third, physical and emotional preparedness to try something new can be cultivated by theatre games, warm-ups, and ensemble-building exercises. Finally, SCT has shown that verbal encouragements are important, and can be built in to the entire theatre-making process.

The theory of reasoned action (or planned behavior) is a predictive model of behavior change that takes into account intent to, perceived behavioral control over, and affective stance toward change. From this theory we take the component of emotional arousal as relevant to the study of the relationship between theatre-making and behavioral change. Little research on positive affect for behavior change has been conducted. An important exception is the work of psychologist Barbara Fredrickson, who argues that positive emotions such as joy, interest and contentment can broaden an individual’s thought–action repertoires and build their enduring personal resources,

thus contributing to actions that lead to optimal health (Fredrickson 1998; Frederickson and Branigan 2005). In our pilot study, joy appeared threaded throughout the qualitative data. Joy, arising in contexts appraised as safe and familiar, creates the urge to play, push the limits and be creative; while interest creates the urge to explore, take in new information and experiences, and expand the self in the process [34]. These positive emotions, when associated with a behavior like healthy eating, can lead to stronger future intentions with respect to that behavior. The relationship of emotional arousal to theatre-making activities is obvious. In particular, we believe the facilitated and playful structuring of theatre-making activities can promote *flow states*, or the sweet spot in which challenges and skills balance (Csikszentmihalyi 1991).

Finally, Larkey and Hecht's model of the effects of narrative suggests that certain elements of storytelling — expanded here to include embodied story-making — are more likely to influence attitude, belief and behavior changes in health promotion contexts than others. From this model we are particularly interested in cultural resonance and identification. Health interventions primarily understand narrative as delivery mechanisms for programs of education, attitude and behavior change. In the theatre, of course, narrative and story take on much larger roles and capacities. Larkey and Hecht point out resonance and identification function as “the process of developing a sense of self through narratives, about making sense of experience, and about expressing these identities and interpretation through social interaction” (Larkey and Hecht 2010). When individuals participate in theatre-making they co-create the stories and narratives for both performance and reception. Since theatre-making draws on the

individual identities and capacities of participants, the process and product are both culturally and individually resonant while providing multiple opportunities to acknowledge self and other in context.

To summarize: In this model, no one category of theatre-making necessarily leads in a one-to-one relationship to intermediary outcomes, but taken together they offer a more robust engagement with the realities that both help and hinder behavioral change.

Research Design: Study activities leading to the data

At the core of our study was an elementary school curriculum combining culturally attuned participatory theatre with cooking classes, offering students new experiences with preparing and eating fruits and vegetables. Over the course of six weeks (meeting once a week for 90 minutes), we worked with a group of 26 Latina/o and African American fifth graders in a Phoenix metropolitan valley school, with whom a full Institutional Review Board Human Subjects Review process was completed.⁸

Students completed demographic surveys and pre- and post- questionnaires measuring attitudes, values and beliefs, as well as perceived self-efficacy around healthy eating.

Over the course of the study, we gathered data designed to gauge presence and quality of elements identified in our theoretical model. For example, the teaching artists kept

⁸ We opted for a classroom setting rather than a youth-oriented after-school program in order to ensure the maximum consistency of participants. We chose this age group for two reasons: first, because of existing relationships with the school and the teacher; and more importantly, because children at this age are both starting to make their own decisions about food choice and capable of mastering basic kitchen safety skills.

detailed teaching journals for emic perspectives on theatre-making elements (bracketing, embodiment, ensemble-building, play, rehearsal, authorship, and the manipulation of multiple symbol systems), while the students completed daily journaling assignments using guided questions to elicit evidence of reinforcement, modeling, agency, identification, resonance and emotional arousal. Independent participant-observers used frequency checklists as well as standard observational ethnographic techniques to evaluate, from an etic perspective, reporting presence and absence of each theatre making element as well as an attempt to categorize the qualities of the interactions (Dewalt and DeWalt 2002; Greiner 2004; Spradley 1980). Additionally, we used self reporting mechanisms to illuminate the youth's perspectives of each session and their enjoyment of the day's activities. All measures appear in the Appendices.

We adapted our curriculum from the *Integrated Curriculum Guide for Cooking with Kids*, developed by the Santa Fe-based Cooking with Kids, Inc. (see Walters and Stacey 2009). The bi-lingual activities and recipes in this curriculum align with Common Core State (New Mexico) Standards in Language Arts, Mathematics, and National Health Education Standards, which we adapted to meet Arizona College and Career Readiness Standards. Following the recipes and the science and math standards-based activities in this curriculum, each day we offered a tasting (of citrus fruits, root vegetables, or different types of melons), and/or the assembling, cooking, and eating of dishes featuring those ingredients and others (bean tostadas, jicama/radish salad, and jalapeño/cilantro/watermelon salad).

CENAS team members planned the participatory theatre experiences in advance to correspond with the theatre-making elements included in our theoretical model. As part of the planning, we held a two-day training with artist/cook Karimi for the teaching artists. The point of this training was twofold: one, to help the teaching artists (experienced in theatre but not necessarily in cooking) to learn basic kitchen safety skills and information necessary to build the recipes; and two, to develop the specific participatory theatre activities to go along with each cooking lessons. Examples of such activities included theatre games (e.g. warmups and trust-building exercises that correspond to bracketing, play, and ensemble building); dramatizations (e.g. of the alimentary canal, employing multiple symbol systems and rehearsal); prompted storytelling based on students' home experiences around food and cooking (authorship); the building of tableaux and sketches based on these stories (manipulating multiple symbol systems, rehearsal); and a final performance devised by the teaching artists and students together that built on those prior experiences and most strongly tapped into the theatre elements of bracketing, authorship, manipulating multiple symbol systems, and rehearsal. One of the most popular activities was the "knife dance," a series of movements designed to help students remember and embody the safety protocol required for handling knives in the classroom. Teaching artists conducted lessons in role (as farmers and/or chefs) to lead lessons, encouraging an embodied response to the lesson as students tried it on their own; as we suggested in the discussion of our theoretical model, embodiment not only of the cooking lessons but

also of the stories shared became a bridge between the theatre-making elements and those, like modeling and reinforcement, serving as mediators to individual change.

Each of the first five days featured a combination of cooking classes (integrated with other lessons such as math and science) and participatory theatre activities aimed at helping the students transition from their last class and warm up bodily for the exercises ahead; honoring the students' home experiences and cuisines; elaborating on the experiences they had in trying new foods; and teaching important kitchen safety lessons. We availed ourselves of a large arts classroom for most of the activities, but sometimes we warmed up outdoors and at other times split the group between the regular classroom and the arts classroom. At times the class participated all together; at other times in small groups around a table or in separate rooms for rehearsal; or they worked in two larger groups, each led by one teaching artist in role. At the end of each day, students filled out feedback sheets on that day's activities. On the final (sixth) day, the students gave a performance for other students and teachers in the school gymnasium, which incorporated a variety of the theatre games and sketches, safety and cooking lessons, and recipes developed over the course of the prior five weeks. The performance culminated in a sharing of the jalapeño/cilantro/watermelon salad, prepared by the students for all in attendance. Full lesson plans, recipes, and the script of the final performance appear in the Appendices.

Research Design & Analyses: Research Frame and Methodologies

Qualitative data

The qualitative data collected consisted of the transcripts of daily journal entries by two teaching artists, daily teaching session field notes generated by two independent participant-observers trained in systematic observational methods, and daily journal entries using guiding questions completed by student participants.

The transcriptions of the teaching artist journals and participant observer fieldnotes were reviewed by the team members to identify key concepts. Key personnel developed a coding schema specific to determining observable characteristics of theatre-making components: bracketing, embodiment, ensemble, rehearsal, symbol systems, play and authorship. The transcripts and field notes were coded in an iterative process using the text analysis software program MAXQDA (Berlin, Germany). Due to both time and funding limitations, only one team member coded both the teaching artist journal transcripts and the participant observer fieldnotes. The first cycle of coding used descriptive codes for theatre-making components supported by code memos which were continually refined. Second cycle coding focused on identifying patterns to further refine categorical content and quality indicators; techniques included co-occurrence, corroboration, similarity and sequence. Subcodes indicating participant resistance to and/or engagement with theatre-making components were also developed. This coded data was then quantified in two ways for use in the quantitative analysis: binary variables indicating the absence or presence of each specific theatre-

making element at each class session, and variables indicating the level of daily class engagement with the theatre-making element on a 3-point scale (i.e. high, average, low).

The transcriptions of the student journals were reviewed by team members for accuracy and intelligibility and then entered into MAXQDA. First cycle coding was structural to organize the data by questions. Subsequent coding by a team member categorized data by themes corresponding to the theoretical concepts of modeling, agency, identification, resonance, emotional arousal and reinforcement. Due to the lack of detail in students' written responses, we were not able to indicate the magnitude of their responses corresponding to a Likert scale. Rather, we quantified the responses as a binary (i.e. yes/no) so they could be used in the quantitative analysis as intermediary variables. An exception was the student responses about emotional arousal as students indicated their feelings through figurative rather than a written response (i.e. a series of faces on a range from happy to bored to unhappy). We note that when working with English language learners that this would be more appropriate.

Quantitative data

The quantitative dataset consisted of a demographic questionnaire, 5 validated scales administered twice to students of a 5th grade classroom (n=26, primarily Latina/o and African American) using a within-groups pretest-posttest design, and the variables of daily student response and theatre-making elements (created from the qualitative data as noted above; henceforth referred to as created intermediary variables). The demographic questionnaire (delivered in English and Spanish) asked age, gender, birthplace, language use and race/ethnicity. The 5 scales assessed Healthy Lifestyle

Behaviors (HLBE), Healthy Lifestyle Beliefs (HBE), Perceived Difficulties (PD) in pursuing healthy lifestyles, Healthy Eating Beliefs (HEB), and Self Efficacy in making healthy eating choices (SE-H).

Demographic data, belief and attitudinal scale measures and quantified student responses were entered and analyzed in SAS 9.4. After data cleaning (handling missing data and incorrect entries, value-labeling data, etc.), we calculated Cronbach's alpha of the belief and attitudinal scales for this population to assess internal consistency of response scores (i.e., how closely related a set of items are as a group) as an assessment of a scale's reliability. Generally speaking, the higher the alpha coefficient, the more consistently the items measure the same underlying concept. For each scale, the Cronbach's alpha statistic was computed at each time point to assess the stability of response patterns the scale scores. Both raw and standardized Cronbach's statistics were computed.

We then conducted one-tailed, paired t-tests to examine pre and post scores on the belief and attitudinal scales (outcome variables). For each scale, we set up a null hypothesis stating that the total scale score at time 1 (pre-intervention) is no smaller than that at time 2 (post-intervention) and an alternative hypothesis which contradicts the null. Given that a higher score on each scale indicates a more positive attitude/belief, we tested for a statistically significant change on each measure to support the effectiveness of our intervention. Because the sample size is small, we set significance at $p < .10$ to avoid overestimating non-significant differences.

We next investigated how changes in student responses (created intermediary variables) are related to changes in pre- and post-scores on the belief and attitudinal scales. Based on our theoretical model, there are three groups of responses: 1) Emotional arousal, 2) Agency, Identification and Resonance, and 3) Modeling and Repetition. For each response group and at each time point, we generated a composite response measure by summing the scores from all underlying measures. This process is necessary because all but one created intermediary variable consisted of only binary data (0 and 1) with very little variability. With just two distinct values, we could not effectively describe a growth process which spanned across as many as five time points. Next, we selected only time 1 and time 5 of the three composite response measures under response groups 1 through 3. The time 1 and time 5 response measures were taken at almost the same time as, respectively, the pre-test and post-test scores; we therefore treated these composite response measures at times 1 and 5 as pre- and post-test scores as well.

Next, we computed a within-subject correlation between any scale showing significant pre- and post- difference and each composite student response measure to see whether or not an increase in scores was associated with an increase in each composite response measure (Bland and Altman, 1995).

Findings

Intervention fidelity

Because our study's focus was to test our theoretical model and hypothesize the causal mechanisms associated with individual behavioral change, of primary importance

was confirmation of whether or not session designs led to the actual appearance of the theatre-making elements (fidelity). We used a check sheet as an instrument for the outside observer to note presence or absence of key theatre-making elements. We then triangulated these results with the daily curriculum plan coded for theatre-making elements. The below table notes which elements were present each day from both data sources; our percent agreement was 95.23, indicating high fidelity.

	Bracketing	Authorship	Multi-symbol systems	Rehearsal	Ensemble	Play	Embodiment
Day 1							
Curriculum plan	X	X			X	X	X
Observations	x	x				x	
Day 2							
Curriculum plan	X		X	X	X		X
Observations	x		x	x	X		x
Day 3							
Curriculum plan	X	X	X	X	X	X	X
Observations	x	x	x	x	X	x	x
Day 4							
Curriculum plan	X	X			X		X
Observations	x	x			X		x
Day 5							
Curriculum plan	X	X	X	X	X	X	X
Observations	x	x	x	x	X	x	x
Day 6							
Curriculum plan	X	X	X	X	X	X	X
Observations	x	x	x	x	X	x	x

Chart 1: Theatre Elements Fidelity Chart

Scale reliability

The Cronbach alpha scores are found in Table 1. As can be observed, the raw and the standardized Cronbach's statistics are generally comparable with each other, which is due to the fact that the item scores in each occasion are about the same in variability. The scores in the table indicate strong internal consistency for all five scales across the two time points, based on a widely accepted cutoff of .70 for Cronbach's alpha (Nunnally, 1978). Notably, for three of the five scales (HLB, HLBE and PD), the Cronbach's alpha score at time 2 (post-intervention) is noticeably lower than that at time 1. It seems to indicate, after the intervention, responses to these three scales became less consistent. Further investigation is needed on the underlying cause of this change.

	Healthy Lifestyles BELIEF (HLB)	Healthy Lifestyles BEHAVIOR (HLBE)	Perceived Difficulty (PD)	Healthy Eating Beliefs (HEB)	Self-efficacy (SE-H)
Time 1 raw	0.939892	0.941225	0.945824	0.812212	0.874455
Time 1 standardized	0.938657	0.943557	0.945724	0.811499	0.875484
Time 2 raw	0.768128	0.863736	0.884092	0.827998	0.829533
Time 2 standardized	0.793514	0.863933	0.891023	0.822418	0.837842

Table 1: Cronbach's alpha

Intervention effectiveness

The post-test score of the Self-Efficacy -H scale was significantly higher than the pre-test score, $t(16)=2.43$, $p=.0137<.05$ (see Table 2). In other words, the theatre-making intervention significantly improved students' level of self-efficacy with regards to healthy eating.

	t statistic and df	p value
Healthy Lifestyles BELIEF	$t(20)=2.10$.9757
Healthy Lifestyles BEHAVIOR	$t(20)=1.64$.9421
Perceived Difficulty	$t(19)=1.36$.9052
Healthy Eating Beliefs	$t(18)=1.77$.9528
Self-efficacy-H	$t(16)=-2.43$.0137*

Table 2: Pre-and post-intervention outcome scores

Student responses to intervention

Subsequent analyses focused on exploring the possible contributors to the increase in students' self-efficacy scores. Based on the results of statistical analysis found in Table 3, we conclude that Emotional Arousal (i.e. group 1 composite measure) is relatively strongly associated with an increase in Self-Efficacy-H score, based on a within-subject correlation of .42513564. A similar pattern is observed for Modeling and Repetition (Group 3 composite response measure) and Self-Efficacy-H, based on a within-subject correlation of .42699325. Finally, the relationship between Self-Efficacy-H and Agency, Identification and Resonance (Group 2 composite response measure) appears to be extremely weak, with its within-subject correlation being close to 0.

	Group 1 composite measure from Emotional Arousal only	Group 2 composite measure from Agency, Identification and Resonance	Group 3 composite measure from Modeling and Repetition
Self-Efficacy-H	0.42513564	0.09280323	0.42699325

Table 3: Within-Subjects Correlation Between Self-Efficacy-H and Each Composite Response Measure

Since we conceptualize the student responses of Identification and Resonance as being related to the cultural-specificity of the intervention, we hypothesized that they may serve to amplify the effect of the other student responses. We tested these responses as a moderator of the relationship between Self-Efficacy score and Emotional Arousal, Modeling and Repetition (Group 1 and Group 3 composite measures) by estimating a regression model with Self-Efficacy-H as the dependent variable and three main effects of the three composite measures and two interaction effects (group 2*group 1 and group 2*group 3). In the model, we used the data averaged across the two time points; the results are in Table 4. The parameter estimates for the two interaction effects involving Agency, Identification and Resonance (Group 2 measures) are both positive, indicating an increase in these responses amplifies the effects of Emotional Arousal, Modeling and Repetition on Self-Efficacy-H. However, this amplification effect is marginal as neither interaction was statistically significant. This relationship should be explored further with more precise measures of Agency, Identification and Resonance.

Parameter	Estimate	Standard Error	t value	p-value
Intercept	29.07505672	13.40583099	2.17	.0437
Grp 1	-2.47747499	4.37561681	-0.57	.5782
Grp 2	-8.40967401	9.89915466	-0.85	.4067
Grp 3	-2.45322947	5.74386532	-0.43	.6744
Grp 1*Grp2	0.83328995	2.93616973	0.28	.7798
Grp 3*Grp2	2.21681883	3.68138453	0.60	.5546

Table 4: Testing Moderation Effects

Discussion and Recommendations

Measures

In addition to its serving as a measure of fidelity, we planned to use the checklist to measure both frequency and magnitude of participants with theatre elements. At first, we attempted to use a different check sheet for each of the theatre-making elements, but this modality proved cumbersome and impractical. We also tried to note the number of times an element appeared each day. That too was not feasible given the complexity of the gestalt model and the numbers of students involved. We therefore moved to a consolidated check sheet with space for ethnographic observational data (included in the appendix). A second participant observer noted specific examples of theatre-making elements in action with estimations of how many students were affected. Ultimately, we found neither of these approaches allowed for the comprehensive collection of the data we sought. The nature of ensemble-based theatre-making, by definition, requires the engagement of participants as a group, making it very difficult to systematically observe individual participants. Given enough

resources, videotaping sessions would allow for multiple coding scans at the individual level. Teams of outside observers could also be deployed to track individual theatre making elements. The best scenario would be to develop measures that capture the complex theatre-making process at both the group and individual level. This would be time- and cost-prohibitive as each student would have to be coded individually (through videotaping or multiple observers). Furthermore, there are also legal and logistical difficulties to conduct video recordings of children who are members of vulnerable populations.

As noted above, the created intermediary variables which measured student responses to the theatre-making intervention were not as precise as we would have liked, mainly due to the lack of detail in students' written responses (an artifact of English –language literacy levels in this population). This could be remedied by either using figurative means or individual summative interviews to solicit more detailed responses (again, increasing the time and expense) and then creating a series of scales which are not binary, and could be used for participants to self-report.

Table 5 below shows suggested ways to capturing data about each of the theatre elements described in our model.

Component	Definition	Suggested Data Collection
Bracketing	<p>The outermost ring, <i>bracketing</i>, refers to the process framing theatre-making practices as a whole, both phenomenologically and semiotically. Bracketing indicates the conceptual frame, often consciously invoked, that separates “making theatre” from the main business of living life. The bracketed space allows participants to step outside the real, but remain in relationship to the real. It is the space and process of “Let’s pretend.”</p>	<p>Presence or Absence of:</p> <ul style="list-style-type: none"> • Ritual of beginning or ending • Presence of play or idea of “playing pretend” <p>Individual and group-level observations</p>
Authorship	<p>Active structuring and playful negotiation (devising) of performance—embodied narratives (skits, scenarios, tableaux) based on the collective stories and cultural/social mores of the participants; also, individual contributions to this process.</p>	<p>Individual: Self-report</p> <p>Group: Ethnographic observations, including reports of duration and frequency</p>
Multiple Symbol Systems	<p>Use of multiple symbol (or meaning-making) systems: words, objects, images, music, movement, sounds, et cetera.</p>	<p>Individual: Adaptation of Patrice Pavis’s 2003 Semiotic Performance Questionnaire (<i>Analyzing Performance</i>, D. Williams Trans. Ann Arbor: U of Michigan P).</p> <ul style="list-style-type: none"> • The Actor • Voice, Music, Rhythm • Space, Time, Action • Material Elements of Performance/mise-en-scène • Staging the text <p>Group: Frequency reporting</p>

Component	Definition	Suggested Data Collection
Rehearsal	<p>The collective, reflective and recursive engagement of material through various cycles of creativity:</p> <ul style="list-style-type: none"> • Preparation • Incubation • Insight • Verification <p>In rehearsal processes, participants play with, explore and iterate material, stories, attitudes and emotions using multiple symbols and through embodied form.</p>	<p>Individual: self-report</p> <p>Group: Ethnographic observations, including reports of duration and frequency</p>
Ensemble	<p>Collectives performing together. Ensembles are communities built of trust and the ability to communicate quickly and effectively.</p>	<p>Individual: self-report, including collaboration rubrics widely available through school districts</p> <p>Group: ethnographic observations</p>
Play	<p>Ludic space: act of playing, playfulness and the traditional theatrical understanding of dramatic script and performance. Within play theory, Pellegrini (2009, 16) defines several necessary components for an act to be considered play: intrinsic motivation, attention to the means and not ends, a relationship to instrumental behavior, freedom from external rules, and active engagement.</p>	<p>Individual: self-report</p> <p>Group: Ethnographic observations, including time-based presence or absence checks</p>

Component	Definition	Suggested Data Collection
Embodiment	The physical incorporation or manifestation of a character or idea—is of course an essential aspect of all theatre-making.	Individual: self report Group: Presence or absence frequency count. Descriptive analysis. Time based quantity assessments (i.e. numbers participating).

Table 5: Participatory Theatre Components and Recommended Data Collection

in developing the codes for analyzing the qualitative data, we were able to refine what are some of the observable characteristics of theatre-making. This systematic analytic activity has given us a chance to explore and more precisely determine what theatre-making components look like and how to operationalize these elements for research purposes. An important realization is that, because ensemble theatre-making happens in a group setting and also at the individual level, we would need to have measures at both scales, as reflected in Table 5 above.

In summary, our principal findings from this research were first, that participatory theatre activities were linked to an increase in self-efficacy around healthy eating, which is a pre-condition for individual behavioral change; second, that this increase was most closely associated with the elements of emotional arousal, modeling and repetition introduced in the participatory theatre activity; and third, that the principal instrument developed for tracking the presence and quality of participatory theatre and related engagement activities worked in the aggregate, but requires further refinement for closer tracking to individual attitudinal and behavioral change.

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**Appendices for “Assessing the Impact of Theatre-Making on Individual Behavioral Change:
Applied Theatre and Healthy Eating”**

List of Appendices

A: Project Outline with Standards

B: Day by Day Session Designs

C: Measures

D: Justification for changes in pre/post measurements

Appendix A: Day by Day Session Designs

Food Project Outline with Objectives & Outlines

Yellow: Project Mechanics
Green: Healthy Eating Projects
Blue: Theatre/Drama Projects

Day	Activity	Standards
1	Introduce the Project Pre-Survey Citrus Tasting	
	Scientific Method	Science: Strand 1, Concept 2 PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry. PO 2. Plan a simple investigation that identifies the variables to be controlled. PO 3. Conduct simple investigations (e.g., related to forces and motion, Earth processes) based on student-developed questions in life, physical, and Earth and space sciences. PO 4. Measure using appropriate tools (e.g., ruler, scale, balance) and units of measure (i.e., metric, U.S. customary). PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log). Science: Strand 1, Concept 4 PO 1. Communicate verbally or in writing the results of an inquiry. PO 3. Communicate with other groups or individuals to compare the results of a common investigation.
	Teacher-in-Role as Farmer & Chef Descriptive Words from tasting Popcorn Poem Creation Gesture & Tableau	Theatre: Strand 1, Concept 1 PO 101. Demonstrate respect for others' opinions by respectfully listening while ideas are articulated. PO 102. Cooperate in the dramatic process. PO 103. Demonstrate the ability to collaborate while coming to consensus in the dramatic process.

2	Recap the Previous Day Tostada Meal	
	Recipe Math in classroom Focus activity & Knife Safety Cutting and Mixing Tostada Assembly Plate Method questions	5.MD.1: Convert among different-sized standard measurement units within a system 5.NF.6: Solve real world problems involving multiplication of fractions and mixed numbers
	Food Memory Sharing Think, Pair, Share Storytelling Homework Prompt	ELA.5th Grade Writing.3: Write narratives to develop real or imagined experiences
3	Recap the Previous Day Root Vegetable Tasting	
	Machine the body as warmup (digestive system) Apply VSP to the meal	ELA.Speaking & Listening.1.d: Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions Health: Strand 1, Concept 3 PO 2. Describe the key nutrients contained in the food groups and how these nutrients affect health and learning 5.NF.6: Solve real world problems involving multiplication of fractions and mixed numbers Health: Strand 5, Concept 2 PO 5. Choose a healthy option when making a decision
	Model script share Think/Pair/Share Share food memory scripts in small groups	Science Strand 4. Life Sciences. Concept 1. Structure and Functions of Living Systems: PO 1: Identify the functions/parts of skeletal system PO 2: Identify the types of muscles

	<p>Chose one per group and share in whole class Go to improve is time remains</p>	<p>PO 3: Identify the functions/parts of nervous system PO 4: Distinguish between voluntary & involuntary responses</p> <p>ELA. Speaking & Listening.1: Engage effectively in a range of collaborative discussions</p>
4	<p>Recap the Previous Day Radish Meal</p>	
	<p>Radish Salad Reflect on Plate.VSP in first three lessons (reflect/review)</p>	<p>5.NF.6: Solve real world problems involving multiplication of fractions and mixed numbers</p> <p>ELA.Speaking & Listening.1.d: Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions</p>
	<p>Walk the grid with cooking gesture Distribute the Scripts Practice the Scripts</p>	<p>Theatre: Strand 2, Concept 2 PO 105. Infer a character's motivations and emotions and predict future action.</p> <p>Theatre: Strand 1, Concept 2 PO 202. As a character, play out her/his wants by interacting with others, maintaining concentration, and contributing to the action of classroom improvisations (e.g., scenes based on personal experience and heritage, imagination, literature, and history). PO 203. Demonstrate mental and physical attributes required to communicate characters different from themselves (e.g., concentration, sense recall, ability to remember lines and cues, breath and vocal control, body alignment, flexibility, and coordination).</p>

5	Recap the Previous Day Melon Tasting	
	Scientific Method	<p>Science: Strand 1, Concept 2 PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry. PO 2. Plan a simple investigation that identifies the variables to be controlled. PO 3. Conduct simple investigations (e.g., related to forces and motion, Earth processes) based on student-developed questions in life, physical, and Earth and space sciences. PO 4. Measure using appropriate tools (e.g., ruler, scale, balance) and units of measure (i.e., metric, U.S. customary). PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log).</p> <p>Science: Strand 1, Concept 4 PO 1. Communicate verbally or in writing the results of an inquiry. PO 3. Communicate with other groups or individuals to compare the results of a common investigation.</p>
	Practice the Scripts	<p>Theatre: Strand 1, Concept 2 PO 202. As a character, play out her/his wants by interacting with others, maintaining concentration, and contributing to the action of classroom improvisations (e.g., scenes based on personal experience and heritage, imagination, literature, and history). PO 203. Demonstrate mental and physical attributes required to communicate characters different from themselves (e.g., concentration, sense recall, ability to remember lines and cues, breath and vocal control, body alignment, flexibility, and coordination).</p>
6	Recap the Previous Day Post-Survey	

	Wrap-up the Experiment	
	<p>Apply Plate.VSP to the whole experience Create Own Plate or VSP that incorporates at least 50% foods from project</p>	<p>ELA.Speaking & Listening.1.d: Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions</p> <p>Health: Strand 1, Concept 1 PO 1. Describe the relationship between healthy behaviors and personal health</p> <p>Health: Strand 5, Concept 2 PO 3. List healthy options to health-related issues or problems</p>
	<p>Perform Scripts for each other, other classes</p>	<p>Theatre: Strand 1, Concept 2 PO 202. As a character, play out her/his wants by interacting with others, maintaining concentration, and contributing to the action of classroom improvisations (e.g., scenes based on personal experience and heritage, imagination, literature, and history). PO 203. Demonstrate mental and physical attributes required to communicate characters different from themselves (e.g., concentration, sense recall, ability to remember lines and cues, breath and vocal control, body alignment, flexibility, and coordination). PO 205. Implement theatre etiquette in rehearsal and production settings.</p>

Appendix B: Day-by-day Session Designs

CENAS Project at X Elementary School

Day 1: Introductions & Citrus Tasting

Date: April 2, 2015

Objectives

- To become familiar with the VSP/Plate Food Model
- To demonstrate correct use of the scientific method and observation while examining various types of citrus fruits.
- To demonstrate the ability to try new foods
- To describe in writing characteristics of food items

Standards

Science: Strand 1, Concept 2

PO 2. Plan a simple investigation that identifies the variables to be controlled.

PO 3. Conduct simple investigations (e.g., related to forces and motion, Earth processes) based on student-developed questions in life, physical, and Earth and space sciences.

PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log).

Science: Strand 1, Concept 4

PO 1. Communicate verbally or in writing the results of an inquiry.

PO 3. Communicate with other groups or individuals to compare the results of a common investigation.

Theatre: Strand 1, Concept 1

PO 101. Demonstrate respect for others' opinions by respectfully listening while ideas are articulated.

Theatre: Strand 1, Concept 4

PO 103. Improvise by imitating life experiences, knowledge of literature, social issues, and/or historical situations, and create imaginary scenes that include characters, setting, and storyline.

Packet Items:

- Cooking with Kids Cover Sheet
- Cooking Utensils pictures
- Rainbow of Foods Activity (Pre-Assessment)
- Food Groups Activity (Pre-Assessment)
- Letter from Citrus Growers
- Citrus Fruits Info Page with Vocab, History, and tree stuff
- Citrus Chart

- Bar Graph Sheet

Materials

Copies

- Class set of the Assent Letters
- Class set of the Pre-Survey
- Set of Poem Assignment Sheets
- List-What-You-Ate Activity

Food

- 3-4 types of citrus

Supplies

- Large Poster Board for VSP Recording
- 4-6 cutting boards and 4-6 knives
- Garbage bags
- Hand wipes for cleaning hands
- Paper cups for water

Content (Inside the Classroom)

- Introduce the project to the class
- Collect remaining Assent forms
- Distribute the Pre-Survey

Warm-Up Activity (Outside)

- Name Game: Food & Action, and Name
 - Go around the circle and hear from everyone
- Master Ninja Baker
 - Round One: Pie
 - Round Two: Strudel

Content (In the Lab)

- Introduce the VSP/Plate Method & connect to citrus
- Farmer in Role
 - While the students are tasting & recording, enter the “Teacher-In-Role” as a citrus farmer
 - Hot-Seat the “Farmer”? Class asks questions about citrus farming?
- Chef in Role
 - Introduce the Quadrant Chart
- Both Characters in Role
 - Present Citrus Varieties & have students write the name of one in each box
 - Take students through the senses in order to collect data on the citrus
 - Touch
 - How does it feel? What other textures does it remind you of?
 - Sight
 - Describe its appearance? Colors, size, shape, irregularities
 - Sound

- Roll the citrus, bounce it, drop it, shake it
 - What sounds does it make during this experience?
 - Smell
 - Put the citrus to your nose & describe the scent
 - Taste
 - Guide the students through the opening process
- Chef In Role
 - Have students complete the observation sheet
 - Rank their favorites
 - Combine data on the board via tally marks for the favorite.
 - Have students convert that tallied data into a bar graph
- Farmer in Role
 - Introduce the idea of how great it'd be to have them write some poems about their experiences to use on her website...or brochures...farm poetry slam
 - Students write food/farm/eating poetry & share with the group
- Both Characters in Role
 - Have students highlight/circle/underline words or phrases they think are special
 - Questions to Fuel the Pieces
 - What did you like? Not like?
 - Observations on the objects themselves
 - Create a Choral poem based on the pieces
 - Write the ideas on the board and phrase poetically
 - Create tableau or frozen images of each fruit

Content (In the Classroom)

- Student Reflection Worksheet

For Next Week

- Return your signed Assent Forms

CENAS Project at X Elementary School

Day 2: Tostadas & Storytelling

Date: April 2, 2015

Objectives

- To explore the similarities and differences between science and cooking
- To practice measurement conversion skills
- To demonstrate correct safety practices while preparing food
- To reflect on their own food experiences

Standards

Science: Strand 1, Concept 2

PO 4. Measure using appropriate tools (e.g., ruler, scale, balance) and units of measure (i.e., metric, U.S. customary).

Mathematics: Number and Operations, Fractions

5.NF.B.6: Solve real world problems involving multiplication of fractions and mixed numbers

Mathematics: Measurement and Data

5.MD.A.1: Convert among different-sized standard measurement units within a system

English Language Arts: Writing

5.W.3: Write narratives to develop real or imagined experiences

Theatre: Strand 1, Concept 4

PO 104. Create original, brief stories through improvisation that include a storyline and characters.

Theatre: Strand 1, Concept 1

PO 101. Demonstrate respect for others' opinions by respectfully listening while ideas are articulated.

Science: Strand 1, Concept 2

PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

Theatre: Strand 1, Concept 4

PO 104. Create original, brief stories through improvisation that include a storyline and characters.

Packet Items

- North American Map and Continent List

- Mexico Map with states, water, directions
- Beans Info, History, and Vocab
- Bean plant picture with labeling of plant parts
- Recipe math activity
- Black Beans Recipe & Salsa Recipe
- Writing/Drawing Activity: What healthy eating looks like

Materials

Copies

- What Healthy Eating Looks Like
- Food Memory Assignment Sheet

Food (Recipe for 4-6 People) Buy 4x the recipe: Each group does a doubling of it

- Black Beans
 - 2, 15 oz cans of black beans (Stephanie)
 - ½ medium red onion chopped
 - 2 garlic cloves, minced
 - 2 tbsp vegetable oil (Stephanie)
 - ½ tsp ground cumin (Stephanie)
 - ½ tsp salt (Stephanie)
 - ½ tsp oregano (Stephanie)
- Salsa Fresca
 - 5 medium tomatoes
 - 1-2 jalapenos
 - 2 garlic cloves, minced
 - ¼ medium red onion
 - 3 tbsp lime juice (In exact squeezing) (Stephanie)
 - ½ tsp salt
 - 1/8 tsp black pepper (Stephanie)
 - 1 tbsp chopped cilantro (Stephanie)
- Tostada Toppings (Pre-prepared)
 - 6 oz grated mild cheddar cheese
 - ½ head romaine lettuce
- Corn Tostadas (Pre-Purchased)

Supplies

- Two Spatulas (Stephanie)
- Two frying pan/sauté pans (Andy: 1, Stephanie: 1)
- Potato Masher (Stephanie)
- Colander
- Table Top Cooking Units
- 15 Knives & 15 cutting boards
- Garbage bags
- Hand wipes for cleaning tables
- Paper cups for water
- Plates & Cutlery for Eating

- Serving Spoons

Content (In the Classroom)

- Collect any remaining Assent/Consent letters
- Today, we will be working together on a bit of a science project...cooking. How are cooking and science alike? Different?
 - Elicit responses from the class
- Go over the recipe on the board/projector & have paper copies available
- Now there are more than four of us, so we will need to multiply this recipe.
 - Work through the multiplication of Cups, teaspoons, pounds, etc.
 - Wait, we only have these measuring cups...1/3 & 1/4, so how can many do we need...some math problem here for them to solve
- Now that we know our supplies & measurements, let's start the process

Content (Outside)

- Master Ninja Baker:
- Intro Knife Safety & Create a Knife Dance: (Now a warm-up for each knife-day)
 - Opening Movement
 - Starfish hands
 - Holding a knife
 - Travelling with a knife
 - "Knife" (Call & Response)
 - "Thank You Knife"
 - Body Position, knees bent & squared off
 - Closing Movement
- Handwashing: Count off by 2. 1s go into the classroom to wash hands, and 2s go into the lab to wash hands. The room is pre-set in two groups and 1s are a group and 2s are a group. We will need to hold the door open for the transport

Content (In the Lab)

- Each group is making the tostadas in and of themselves
 - Ashley & Erica will be doing this differently
 - One will use a specific prompt. "As we are cutting and preparing our meal, I want you to share a great meal experience"
 - One will share a personal story and allow the students to build off similar experiences
- Cutting Time
 - Students will be cutting in pairs, taking turns and observing each other
 - Prime the students memories with probing questions
- Assembly
- Eating
- Food Memory Sharing
 - Whole Class Prompt: "Think back to a time when you ate a meal that was very special for you or your family. Tell us about it."
 - Go around the room and have students share stories while they eat

- If time left is around 20 minutes, then the class shares as a whole
- If time left is around 10 minutes, share in small groups

Content (In the Classroom)

- Students write their general ideas down for the Food Memory on the writing assignment sheet
- Student Reflection Worksheet
- Pick up the Poem/What I ate this week

For Next Week

- Complete the Food Memory assignment

CENAS Project at X Elementary School

Day 3: Root Vegetable Tasting

Date: April 17, 2015

Objectives

- To demonstrate correct use of the scientific method and observation while examining various types of melons.
- To demonstrate the ability to try new foods
- To describe in writing characteristics of food items

Standards

Science: Strand 1, Concept 2

PO 2. Plan a simple investigation that identifies the variables to be controlled.

PO 3. Conduct simple investigations (e.g., related to forces and motion, Earth processes) based on student-developed questions in life, physical, and Earth and space sciences.

PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log).

Science: Strand 1, Concept 4

PO 1. Communicate verbally or in writing the results of an inquiry.

PO 3. Communicate with other groups or individuals to compare the results of a common investigation.

Theatre: Strand 1, Concept 1

PO 101. Demonstrate respect for others' opinions by respectfully listening while ideas are articulated.

Science Strand 4. Life Sciences. Concept 1. Structure and Functions of Living Systems:

PO 1: Identify the functions/parts of skeletal system

PO 2: Identify the types of muscles

PO 3: Identify the functions/parts of nervous system

PO 4: Distinguish between voluntary & involuntary responses

English Language Arts: Speaking and Listening

5.SL.1: Engage effectively in a range of collaborative discussions

5.SL.1.D: Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions

Health: Strand 1, Concept 3

PO 2. Describe the key nutrients contained in the food groups and how these nutrients affect health and learning

Theatre: Strand 1, Concept 4

PO 103. Improvise by imitating life experiences, knowledge of literature, social issues, and/or historical situations, and create imaginary scenes that include characters, setting, and storyline.

Theatre: Strand 1, Concept 4

PO 104. Create original, brief stories through improvisation that include a storyline and characters.

Packet Items:

- Root Vegetable Information Sheet
- Part Writing Activity: Food Memory
- Pie Chart Sheet

- Root Vegetable Chart (Separate)

Materials

Copies

- Set of Food Memory Revision Assignment
- Set of Write/Draw Activity (Homework Assignment)

Food

- Variety of Root Vegetables
 - Carrots: 12 (1-2 bunches)
 - Jicamas: 3
 - Radishes: 12 (1-2 bunches)

Supplies

- Bring all the knives back to the box (Don't have the students wash them)
- All Cutting Boards
- Hand wipes for cleaning hands
- Plates & Cutlery for Eating

Content (Outside)

- Circle Dash
- Machine
 - One Version
 - Digestion Version
 - Dramatize the Food/Nutrient Process
 - Chewing, Swallowing, Peristalsis, Absorption, Excretion
 - Voluntary & Involuntary
- Knife Dance
- Hand washing: Split the class into two groups. One half goes to the classroom & the other to the lab to wash their hands

Food Content (In the Lab)

- Quadrant Sheet (Separate from the Packet)

- Present Root Vegetable Varieties & have students write the name of one in each box
- Take students through the senses in order to collect data on the root vegetable
 - Touch (Pre-Cut)
 - How does it feel? What other textures does it remind you of?
 - Sound (Pre-Cut)
 - Roll the root, bounce it, drop it, shake it
 - What sounds does it make during this experience?
- Guide students through the opening process
 - Sight (Pre-Cut & Post-Cut)
 - Describe its appearance? Colors, size, shape, irregularities
 - Smell (Post-Cut)
 - Put the melon to your nose & describe the scent
- Guide the students through the safe cutting process to access the taste portion of the class
 - Project the safe cutting procedures on the board
 - Taste (Post-Cut)
 - Have stations set up with each of the root varieties
 - Students rotate from area to area to try each and to write down their observations
- Voting with a Check: Combine data on the board via check marks for the favorite.

Drama Content (In the Lab)

- Inspiration Post-Its: Students each get three post-its and write a word or phrase that sticks out to them.
 - Place the post-its and attach them to the board
 - Students divide into groups
- Group Work: Post-It Tableaus
 - Use the words and phrases to create a tableau...inspired by the words and phrases you chose
- Students get into groups and share their written plays
 - Erica & Ashley Playback Theatre Style
 - Students describe their scenes to Erica & Ashley & the two then perform the scenes
 - Erica & Ashley scaffold this in the groups
 - “Who is excited about their ideas?”
 - Share their scenes with the whole class
- Apply Food Model to First 3 Lessons!
- Tableau of Joyful Eating

For Next Week

- Write/Draw Activity

Closure

- Collect Food Memory Pieces

- Student Reflection Worksheet

CENAS Project at X Elementary School

Day 4: Root Vegetable Meal

Date: April 30, 2015

Objectives

- To demonstrate the ability to try new foods

Standards

Science: Strand 1, Concept 2

PO 4. Measure using appropriate tools (e.g., ruler, scale, balance) and units of measure (i.e., metric, U.S. customary).

Mathematics: Number and Operations, Fractions

5.NF.B.6: Solve real world problems involving multiplication of fractions and mixed numbers

Mathematics: Measurement and Data

5.MD.A.1: Convert among different-sized standard measurement units within a system

Theatre: Strand 1, Concept 1

PO 102. Cooperate in the dramatic process.

PO 103. Demonstrate the ability to collaborate while coming to consensus in the dramatic process.

Theatre: Strand 1, Concept 2

PO 101. Imagine and describe characters, their relationships, what they want and why (e.g., through variations of movement and gesture, vocal pitch, volume, and tempo).

Theatre: Strand 1, Concept 2

PO 102. Sustain a scene using appropriate language or movement with the teacher role-playing or giving clues (e.g., from literature or students' personal experiences).

PO 202. As a character, play out her/his wants by interacting with others, maintaining concentration, and contributing to the action of classroom improvisations (e.g., scenes based on personal experience and heritage, imagination, literature, and history).

PO 205. Implement theatre etiquette in rehearsal and production settings.

Packet Items

- Roasted Root Vegetable Recipe
- Draft of the Script

Materials

Food (Recipe for 4-6 People)

- 1 medium/large jicama
- 10 oz shredded carrots
- 1 bunch radishes
- ½ cup sliced green onion (Cut by scissors)
- 1 cup cilantro (Cut by scissors)
- Dressing
 - 2 tablespoons lime juice (4 limes)
 - ½ teaspoon Tabasco (Green Tabasco)
 - ¼ teaspoon ground cumin (Stephani)
 - ½ teaspoon salt (Stephani)
 - 3 tablespoons olive oil

Supplies

- All Cutting Boards & Knives
- Scissors
- Two large bowls and several small gathering bowls
- Hand wipes for cleaning hands
- Paper cups for water
- Plates & Cutlery for Eating

Warm-Up (In the Lab)

- Apply VSP/Plate Content to the Meal (Lead by Erica, Ashley writes)
 - Review the First Three Days and Fill out the information on the board
- Knife Dance (Lead by Ashley, Erica supports)
 - Consider doing a set quantity on the “Knife, Thank You Knife” repetitions and other repetitions in the dance. It might be easier for the students to follow and do on their own if they know there are 5 of each repetition.

Food Content (In the Lab)

- Divide Class into three groups (2 larger and 1 smaller)
 - Count off by 5s
 - 1s & 3s (approx. 10 students) are cutting jicama with Ashley
 - 2s & 4s (approx. 10 students) are cutting radishes with Erica
 - 5s (approx. 5 students) are cutting green onion & cilantro, assembling vinaigrette with Gloria
- Wash Hands (Divide and conquer. Ashley takes her group to other classroom)

Recipe: Jicama and Carrot Slaw with Radishes, Cilantro, and Cumin-Lime Vinaigrette (Makes about 6 servings, recipe created by Kalyn)

- Ingredients
 - Slaw
 - 4 cups matchstick jicama strips (1 medium-large jicama)

- 2 cups shredded carrots (10 oz.)
 - 1 bunch radishes, cut in to half-moon slices (about 10 radishes)
 - 1/2 cup thinly sliced green onion
 - 1 cup chopped cilantro (or less; can also use Italian parsley or a combination of cilantro and parsley)
- Dressing:
 - 2 T fresh lime juice (I used my freshly-frozen lime juice)
 - 1/2 tsp. Green Tabasco Sauce (or more; use your favorite hot sauce if you don't have this)
 - 1/4 tsp. ground cumin (or slightly more if you really like cumin)
 - 1/4 tsp. sea salt
 - 3 T extra-virgin olive oil
- Directions
 - Peel the jicama, then use a mandoline, large grater, or a knife to cut the jicama into matchstick pieces. Grate carrots (or use pre-shredded carrots like I did.) Wash and trim radishes, then cut into half-moon shapes. Wash and dry green onions, then thinly slice. Wash cilantro (or parsley), spin dry or dry with paper towels, then chop with chef's knife.
 - In a small bowl or glass measuring cup mix together the lime juice, Green Tabasco sauce, ground cumin, and sea salt. Whisk in the olive oil, one tablespoon at a time.
 - Put jicama strips, shredded carrots, sliced radishes, and sliced green onion in a bowl and toss so they are well combined, then toss again with desired amount of dressing. (You may not want all the dressing if you like your salads on the dry side.) Add chopped cilantro (or parsley) and toss again.
 - Serve right away or chill in the refrigerator for a few hours. I was pleasantly surprised that this was still very good after being in the fridge overnight. It would probably keep even longer than a day, but it might need a bit more dressing added to perk up the flavors.
- Once groups start cutting, use the smaller bowls to gather the materials. Do NOT mix into the larger bowls until final assembly. We need to measure out the components
- Once groups start finishing, begin clean-up process. Do NOT have students wash knives. They CAN wash & dry the cutting boards ☺
- Students can also set the tables for food (plate, napkin, fork, cup for water)
- While the students are eating, we can introduce the final performance

Drama Content (In the Lab)

- Rough Draft Review of the Script
 - Assemble the scripts in a sequence
 - What do we still need?

Closure

- Student Reflection Worksheet
- Joyful Eating Tableau (Lead by Ashley, Erica supports & wrangles children)

CENAS Project at X Elementary School

Day 5: Melon Tasting

Date: May 1, 2015

Objectives

- To practice measurement conversion skills
- To demonstrate correct safety practices while preparing food
- To reflect on their own food experiences

Standards

Science: Strand 1, Concept 2

PO 4. Measure using appropriate tools (e.g., ruler, scale, balance) and units of measure (i.e., metric, U.S. customary).

Mathematics: Number and Operations, Fractions

5.NF.B.6: Solve real world problems involving multiplication of fractions and mixed numbers

Mathematics: Measurement and Data

5.MD.A.1: Convert among different-sized standard measurement units within a system

Science: Strand 1, Concept 2

PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

Theatre: Strand 1, Concept 1

PO 101. Demonstrate respect for others' opinions by respectfully listening while ideas are articulated.

Theatre: Strand 1, Concept 1

PO 102. Cooperate in the dramatic process.

PO 103. Demonstrate the ability to collaborate while coming to consensus in the dramatic process.

Theatre: Strand 1, Concept 2

PO 101. Imagine and describe characters, their relationships, what they want and why (e.g., through variations of movement and gesture, vocal pitch, volume, and tempo).

Theatre: Strand 1, Concept 2

PO 102. Sustain a scene using appropriate language or movement with the teacher role-playing or giving clues (e.g., from literature or students' personal experiences).

PO 202. As a character, play out her/his wants by interacting with others,

maintaining concentration, and contributing to the action of classroom improvisations (e.g., scenes based on personal experience and heritage, imagination, literature, and history).

PO 203. Demonstrate mental and physical attributes required to communicate characters different from themselves (e.g., concentration, sense recall, ability to remember lines and cues, breath and vocal control, body alignment, flexibility, and coordination).

PO 205. Implement theatre etiquette in rehearsal and production settings.

Packet Items

- Melon Info, history, and vocab
- Plant image and labeling
- Melon Math activity
- Writing Activity: When I get home from school I eat...

Materials

Copies

- Set of Food Memory Revision Assignment
- Set of Write/Draw Activity (Homework Assignment)

Food

- 4 Watermelon (Cut in half before letting them cut)
- 4 Cantalope (Cut in half before letting them cut)
- 4 Honey Dew (Cut in half before letting them cut)

Supplies

- 4-6 cutting boards and 4-6 knives
- Garbage bags
- Hand wipes for cleaning hands
- Paper cups for water
- Plates
- Toothpicks

Warm-Up 5 minutes

- Shake Out

Food Content (In the Lab) 25 minutes

- Today, we are in role at scientists: Whole Class
 - Ask how do scientists behave? How do they talk?
 - We are research teams and have discovered 3 odd orbs on this planet
 - We need to find out what these are & describe them for our friends back home
- Present Melon Varieties
- Divide students into four groups and give each the objects
- Take students through the senses in order to collect data on the citrus
 - Touch (Pre-Cut)
 - How does it feel? What other textures does it remind you of?

- Sound (Pre-Cut)
 - Roll the melon, bounce it, drop it, shake it
 - What sounds does it make during this experience?
- Students do not get to open the objects until the entire group has observations written on their grid.
- Then the group does the knife dance!
- Guide students through the opening process. We will need to make the first big cut in order to be safe
 - Sight (Pre-Cut & Post-Cut)
 - Describe its appearance? Colors, size, shape, irregularities
 - Smell (Post-Cut)
 - Put the melon to your nose & describe the scent
- Guide the students through the safe cutting process to access the taste portion of the class
 - Project the safe cutting procedures on the board
 - Taste (Post-Cut)
 - Have stations set up with each of the melon varieties
 - Students rotate from area to area to try each and to write down their observations
- Apply Food Model!

Drama Content

- Practice Scripts
 - Go Over Script with Names [1:05]
 - Divide into the 3 groups (Ashley, Erica, Stephani) [1:25]
 - Rooms:
 - Stephani & Sub—5th Grade Classroom
 - Ashley—staying in the lab
 - Erica—staying in the lab or outside
 - Choral Poems: 3 groups
 - Practice Scenes: 3 groups
 - Practice the Machine: 5 groups [1:50]

Closure [2:05]

- Student Reflection Worksheet

CENAS Project at X Elementary School

Day 7: Wrap-Up
Date: May 8, 2015

Objectives

- To reflect on healthy decision-making.
- To describe in writing how healthy food choices can affect their lives
- To perform written scripts for their community

Standards

Theatre: Strand 1, Concept 1

PO 101. Demonstrate respect for others' opinions by respectfully listening while ideas are articulated.

Health: Strand 1, Concept 1

PO 1. Describe the relationship between healthy behaviors and personal health

Health: Strand 1, Concept 3

PO 2. Describe the key nutrients contained in the food groups and how these nutrients affect health and learning

Health: Strand 5, Concept 2

PO 3. List healthy options to health-related issues or problems
PO 5. Choose a healthy option when making a decision

Theatre: Strand 1, Concept 1

PO 102. Cooperate in the dramatic process.
PO 103. Demonstrate the ability to collaborate while coming to consensus in the dramatic process.

Theatre: Strand 1, Concept 2

PO 101. Imagine and describe characters, their relationships, what they want and why (e.g., through variations of movement and gesture, vocal pitch, volume, and tempo).

Theatre: Strand 1, Concept 2

PO 102. Sustain a scene using appropriate language or movement with the teacher role-playing or giving clues (e.g., from literature or students' personal experiences).
PO 202. As a character, play out her/his wants by interacting with others, maintaining concentration, and contributing to the action of classroom improvisations (e.g., scenes based on personal experience and heritage, imagination, literature, and history).
PO 203. Demonstrate mental and physical attributes required to communicate characters different from themselves (e.g., concentration, sense recall, ability to

remember lines and cues, breath and vocal control, body alignment, flexibility, and coordination).

PO 205. Implement theatre etiquette in rehearsal and production settings.

Materials

Copies

- Set of the final assessments
- Set of performance rubrics
 - Self-Assessment
- Set of VSP/Plate Method Circular Self Assessment

Food

-

Supplies

-

Research Study Content

- Discussion Activity
- Final Surveys

Warm-Up Activity

- Physical and Mental Warm Up before the performances

Food Content

- Apply VSP/Plate Method
- Create Own VSP/Plate w/ 50% of our stuff added

Drama Content

Perform scripts for each other

Closure

- Sharing Circle?

Appendix C: Measures

DEMOGRAPHIC INFORMATION

These questions ask about your background. Your answers will help us interpret the information provided by all study participants. **This information will not be connected to you as an individual in any way.**

1. What is your gender? **GENDER**

Male..... 1

Female..... 2

2. How old are you? _____ **AGE**

3. How do you describe your race? **RACE**

White..... 1

Black/African American..... 2

Native American..... 3

Alaska Native..... 4

Native Hawaiian/Other Pacific Islander..... 5

Asian..... 6

Other..... 7

[PLEASE SPECIFY] : _____ **OTHERRACE**

Don't Know..... 8

4. Where were you born? **BIRTHSTATE** **BIRTHCOUNTRY**
(State) (Country if not USA)

5.a. Do you speak another language fluently besides English? **OTHERLANGUAGE**

Yes (Go to question 5.b.)..... 1

No...(Go to question 6)..... 2

5.b. If yes, what other languages do you speak? _____ **OTHERLANGTYPE**

6. Here are some classifications used by researchers to describe generations or immigrants

Please mark which **one** you feel describes you the best: GENERATION

1st generation – You were born in Mexico or another country..... 1

2nd generation – You were born in the USA; either one of your parents was born 2
in Mexico or other country.

Name of country or countries if not Mexico: _____

3rd generation – You were born in the USA, both parents were born in USA 3
and all grandparents were born in Mexico or other country /countries.

Name of country or countries if not Mexico: _____

4th generation – You and your parents were born in USA and at least one 4
grandparent was born in Mexico or other country with the
remainder born in the USA.

Name of country or countries if not Mexico: _____

5th generation – You and your parents born in USA and all grandparents..... 5
were born in the USA.

*Thank you! Please continue to the next
set of questions.*

Recoded Variables
RACERECODE
BIRTHSTATERECODE

Healthy Lifestyles Belief Scale HLB1-16 T1-T2

Below are 16 statements that relate to your overall health and well-being. There are no right or wrong answers to the following statements. Please circle the number that best describes your agreement or disagreement with each statement.

			Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
HLB1_T1	1	I am sure that I will do what is best to lead a healthy life.	1	2	3	4	5
HLB2_T1	2	I believe that eating a healthy diet will help me to feel better about myself.	1	2	3	4	5
HLB3_T1	3	I am certain that I will make healthy food choices.	1	2	3	4	5
HLB4_T1	4	I believe it is easy to make healthy changes.	1	2	3	4	5
HLB5_T1	5	I believe that I can reach the goals that I set for myself.	1	2	3	4	5
HLB6_T1	6	I am sure people in my community will listen to me about nutrition,	1	2	3	4	5
HLB7_T1	7	I believe that I can be more active.	1	2	3	4	5
HLB8_T1	8	I am sure that I will do what is best to keep myself healthy.	1	2	3	4	5
HLB9_T1	9	I am sure that I can spend less time watching TV.	1	2	3	4	5
HLB10_T1	10	I know that I can make healthy snack choices regularly.	1	2	3	4	5
HLB11_T1	11	I believe my culture is a resource for healthy behaviors.	1	2	3	4	5
HLB12_T1	12	I know what to do when things bother or upset me.	1	2	3	4	5
HLB13_T1	13	I believe that my family will help me to reach my goals.	1	2	3	4	5
HLB14_T1	14	I am sure that I will feel better about myself if I exercise regularly.	1	2	3	4	5
HLB15_T1	15	I believe that cooking healthy meals is fun.	1	2	3	4	5
HLB16_T1	16	I am sure that I can engage others through storytelling.	1	2	3	4	5

Healthy Lifestyle Behavior Scale HLBE1-16 T1-T2

Directions: Please answer the following questions to the best of your ability.

			Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
HLBE1_T1	1	I make healthy food choices.	1	2	3	4	5
HLBE2_T1	2	I exercise on a regular basis.	1	2	3	4	5
HLBE3_T1	3	I exercise with my children/family on a regular basis.	1	2	3	4	5
HLBE4_T1	4	I limit television viewing and video game playing to 2 hours per day or less.	1	2	3	4	5
HLBE5_T1	5	I eat fresh fruits and vegetable snacks.	1	2	3	4	5
HLBE6_T1	6	I eat more vegetables than meat or starches.	1	2	3	4	5
HLBE7_T1	7	I drink less than 2 sugared drinks a day (for example, regular soda or juice).	1	2	3	4	5
HLBE8_T1	8	I choose water as a beverage instead of a sugared drink at least once a day.	1	2	3	4	5
HLBE9_T1	9	I set goals I can accomplish.	1	2	3	4	5
HLBE10_T1	10	I eat at least three meals a week with my family.	1	2	3	4	5
HLBE11_T1	11	I do not add salt to my food.	1	2	3	4	5
HLBE12_T1	12	I eat broiled or baked foods instead of fried foods.	1	2	3	4	5
HLBE13_T1	13	I feel comfortable talking about health issues with my peers.	1	2	3	4	5
HLBE14_T1	14	I do what I should do to lead a healthy life.	1	2	3	4	5
HLBE15_T1	15	I am conscious of portion size and choose moderation.	1	2	3	4	5
HLBE16_T1	16	I say something positive to my children/family every day.	1	2	3	4	5

Created Variables COMPHLBE HLBESCORE

Perceived Difficulty Scale PD1-12_T1-T2

Below are 16 statements that relate to your overall health and well-being. Please circle the number that best describes your agreement or disagreement with each statement. There are no right or wrong answers.

		How hard or easy it is to do each of the following things?	Very hard to do	Fairly hard to do	Neither hard nor easy to do	Fairly Easy to do	Very easy to do
PD1_T1	1	Eat healthy.	1	2	3	4	5
PD2_T1	2	Not eat unhealthy foods that I like.	1	2	3	4	5
PD3_T1	3	Exercise regularly.	1	2	3	4	5
PD4_T1	4	Exercise instead of watching TV, relaxing, or using the computer.	1	2	3	4	5
PD5_T1	5	Buy healthy foods to eat.	1	2	3	4	5
PD6_T1	6	Find a safe place to exercise.	1	2	3	4	5
PD7_T1	7	Have exercise equipment at home (for example, jump rope, weights, sneakers).	1	2	3	4	5
PD8_T1	8	Take the time to buy healthy foods.	1	2	3	4	5
PD9_T1	9	Take the time to help plan and prepare healthy meals.	1	2	3	4	5
PD10_T1	10	Take the time to exercise regularly.	1	2	3	4	5
PD11_T1	11	Take the time to plan an exercise schedule.	1	2	3	4	5
PD12_T1	12	Cope/Deal with stress.	1	2	3	4	5

Created Variables COMPPD PD-EATHEALTHYSCALE

Healthy Eating Beliefs Scale HEB1-13_T1-T2

Below are 13 statements that relate to your thoughts about healthy eating. There are no right or wrong answers to the following statements. Please circle the number that best describes your agreement or disagreement with each statement.

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	
HEB1_T1	1	Eating a healthy diet means eating boring food.	1	2	3	4	5
HEB2_T1	2	By eating a healthy diet, I will reduce the risk of heart disease and diabetes.	1	2	3	4	5
HEB3_T1	3	Food which is healthy does not taste nice.	1	2	3	4	5
HEB4_T1	4	Eating a healthy diet reduces my enjoyment of food.	1	2	3	4	5
HEB5_T1	5	Eating a healthy diet helps to maintain lower weight.	1	2	3	4	5
HEB6_T1	6	Not eating a healthy diet would make me feel guilty.	1	2	3	4	5
HEB7_T1	7	Eating a healthy diet takes too much time.	1	2	3	4	5
HEB8_T1	8	Eating a healthy diet costs too much money.	1	2	3	4	5
HEB9_T1	9	I find it hard to resist foods which are unhealthy.	1	2	3	4	5
HEB10_T1	10	To eat a healthy diet requires strong motivation.	1	2	3	4	5
HEB11_T1	11	Unhealthy foods are convenient.	1	2	3	4	5
HEB12_T1	12	I don't always know which foods are healthier.	1	2	3	4	5
HEB13_T1	13	Unhealthy foods are more widely available than healthy foods.	1	2	3	4	5

Recoded Variables HEB2 HEB5 HEB6

Created Variables COMPHEB HEBAC

Self-efficacy Scale SE1-5_T1-T2

Directions: Please answer the following questions to the best of your ability.

	It is important to stick to a healthy diet. How certain are you that you are able to maintain a healthy diet ...	Very Certain	Certain	Uncertain	Very Uncertain
SE1_T1	1 ...even if you would have to change various daily habits.	1	2	3	4
SE2_T1	2 ... even if you would have to invest additional effort to convince others that you really want to stick to a healthy diet.	1	2	3	4
SE3_T1	3 ... even if you would have to change your habits regarding grocery shopping.	1	2	3	4
SE4_T1	4 ... even if you would have to change your habits regarding cooking.	1	2	3	4
SE5_T1	5 ... even if you are eating at a restaurant.	1	2	3	4

Created Variables
SE_SUMSCALEMEAN
COMPSELFEFFICACY

STUDENT REFLECTION WORKSHEET DAY ____

Spend a few minutes thinking about what you did in class today, what you did and didn't like, and how it made you feel. Then answer these questions in complete sentences. For each question, write at least **3** sentences

1) Did doing things more than once help you to learn something new? Why or why not?

reinforcement (repetition);

2) Did watching what other people did help you to learn something new? Why or why not?

modeling

3) Did you do what you wanted to class today? Why or why not?

agency

4) Were there any characters in today's activities that were like you? Why or why not?

identification

5) Were there any stories from today familiar to you or you could imagine it happening to you? Why or why not?

resonance

6) Please circle how today's session made you feel:

emotional arousal



Very
happy



Happy



In
between



Unhappy



Very
unhappy

Theatre-Making Elements Frequency Check Sheet

(mark time for all observations noted per session)

	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6
Bracketing Transitions						
Participant Authorship						
Multiple Symbol Systems in Use						
Rehearsal						
Ensemble						
Play						
Embodiment						

Appendix D: Changes to Pre-Post Measures Justification

Changes to pre and post quantitative measures and justification (4/23/15)

T1 data (missing or inconsistent data)

Overall

8 missed scale items, missed question, or didn't answer 2nd part of 2 part question

1 didn't complete a scale at all

8 gave more than one answer (e.g. circled 2 numbers)

3 contradictory answer (e.g. yes to speaks another language and then answers none when asked to specify)

DETAILS (% not answered or answered unclearly out of 26)ⁱ

There is not enough time given to us to be able to administer all the scales again. We are making the following changes:

measure	pre	Changes to post	justification
Demographics	As written	Not administered per protocol; Q # should be reworded if working with children	--
Healthy Lifestyles belief Scale	As written	Item 6 & 11?	
Healthy Lifestyles Behavior Scale	As written	Not administered	Self-report so less validity
Perceived Difficulty Scale	As written		
Healthy Eating beliefs Scale	As written	Item 5 (Eating a healthy diet helps to maintain lower weight.) Item 8 (Eating a healthy diet costs too much money)	Reduce focus on weight and appearance Children not in charge of shopping
Self Efficacy Scale	As written	Item 3 ... even if you would have to change your habits regarding grocery shopping. Item 4 ... even if you would have to change your	Children not in charge of shopping Children not in charge of cooking

		habits regarding cooking.	
--	--	---------------------------	--

ⁱ Demo

Q2 How old are you? (4%)

Q3 How do you describe your race? (11.5%)

Q5 Do you speak another language fluently besides English? (4%)

Q6 Here are some classifications used by researchers to describe generations or immigrants (15%)

Healthy Lifestyles Belief Scale

Q1 (4%) I am sure that I will do what is best to lead a healthy life.

Q2 (8%) I believe that eating a healthy diet will help me to feel better about myself.

Q4 (8%) I believe it is easy to make healthy changes.

*Q6 (4%) I am sure people in my community will listen to me about nutrition,

*Q11 (4%) I believe my culture is a resource for healthy behaviors.

Healthy Lifestyles Behavior Scale

Q1 I make healthy food choices. (4%)

Q5 I eat fresh fruits and vegetable snacks. (4%)

Q6 I eat more vegetables than meat or starches. (8%)

Q7 I drink less than 2 sugared drinks a day (for ex.regular soda or juice). (4%)

Q10 I eat at least three meals a week with my family. (4%)

Q11 I do not add salt to my food. (4%)

Perceived Difficulty Scale

All (4%)

Q4 Exercise instead of watching TV, relaxing, or using the computer. (4%)

Q11 Take the time to plan an exercise schedule. (4%)

Healthy Eating beliefs Scale

All (4%)

Q3 Food which is healthy does not taste nice. (4%)

*Q5 Eating a healthy diet helps to maintain lower weight. (4%)

Q9 I find it hard to resist foods which are unhealthy. (8%)

Self Efficacy Scale

All (4%)

Q1 even if you would have to change various daily habits. (4%)

(4%) *Q3 even if you would have to change your habits regarding grocery shopping.

*Q4 even if you would have to change your habits regarding cooking. (4%)