

Relationships Between Self-regulation and Use of Parenting Strategies for Eating and Physical Activity Behaviors Among Mexican-heritage Mothers

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Abstract

It is important to understand theoretically based support behaviors that can promote healthy eating and active living among Mexican-heritage mothers. This study examined the relationship between maternal self-regulation (the capacity to plan, guide, and monitor one's behavior flexibly in the face of changing circumstances) and use of parenting strategies among mothers residing along the Texas-Mexico border. Mothers ($n = 116$) were recruited from three geographic regions within Hidalgo County, Texas. A 21-item survey was administered to measure self-regulation through goal setting and limit setting. The Parenting Strategies for Eating and Activity Scale (PEAS) was used to measure parenting strategies such as limit setting, discipline, monitoring, and control. Pearson correlations and multiple linear regression analyses were used to identify relationships between self-regulation (goal setting and impulse control) and parenting strategies. Sociodemographic characteristics of mothers are also reported. On average mothers were 36 years old ($SD = 7.44$), married (82%), identified as Mexican (90%), and had fewer than 9 years of education (68%). Pearson correlations revealed goal setting to be positively associated with limit setting ($r = .246, p < .001$), control ($r = .203, p = .03$), and monitoring ($r = .336, p < .001$). Regression analyses revealed limit setting ($\beta = .246, p < .001$), control ($\beta = .203, p = .03$), and monitoring ($\beta = .336, p < .001$) as parenting strategies that were associated with goal setting ($R^2 = 0.12$). Findings suggest that programs should include goal setting to facilitate use of parenting strategies to support healthy behaviors that promote healthy eating and physical activity. Emphasizing malleable behaviors rather than deficits in parenting strategies could allow for higher receptivity to behaviors that can promote health in a family context.

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Introduction

Obesity is associated with chronic conditions such as cardiovascular disease, type 2 diabetes, high blood pressure, and various types of cancer, and affects more than 90 million individuals nationally (CDC, 2019). Racial or ethnic minorities, those with low socioeconomic status, and/or those that reside in rural areas also face an increased risk for these chronic conditions due

primarily to social determinants of health (James et al., 2017). Hidalgo county, a predominantly Hispanic populated county that lies on the Texas-Mexico border, has more than 29% of individuals classified as obese (NICHQ, n.d.). Areas within Hidalgo County along the south Texas-Mexico border, such as *colonias*, are characterized as rural, low SES, and medically underserved, and are composed primarily of Mexican-heritage populations (NICHQ, n.d.). *Colonia*

populations lack access to both healthy foods and physical activity resources, and face systemic barriers that contribute to chronic disease and obesity rates (Castañeda, 2016; McClendon et al., 2017; Nalty et al., 2013; NICHQ, n.d.; Sharkey, Dean, et al., 2011; Sharkey et al., 2012; Sharkey et al., 2013; Sharkey, Johnson, et al., 2011; Umstatter Meyer et al., 2013). Among mother-child dyads in south Texas *colonias*, more than 40% of children had a poor diet and were overweight or obese, which is also consistent with other studies among Hispanic populations (Arroyo-Johnson & Mincey, 2016; Kaplan et al., 2004; Sharkey et al., 2012; Tamayo et al., 2021). Other studies targeting colonia populations have focused on environmental hazards, infrastructural problems, cancer screenings, and obesity prevention (Coronado et al., 2006; Fernández et al., 2015; Hernandez, 2011; Mier et al., 2013; Ramos et al., 2001; Vincent & Guinn, 2001). Although important, a gap exists for analyzing support for healthy behaviors related to decision making and utilization of parenting strategies. The rates of obesity within underserved Hispanic and/or rural populations posits the need for understanding obesity-related behaviors and family influences contributing to adult and child obesity rates. Antecedents to the behavior of parenting strategies for child physical activity and eating behaviors (to be referred to as ‘support behaviors’ throughout this manuscript) should be further investigated as these can vary across populations, geographic locations, and cultural contexts (Marín & Marín, 1991; Zambrana, 1995).

Role of Parenting Strategies

Parenting strategies (strategies that collectively shape parenting styles) have been identified as a key factor for child eating and physical activity behaviors (Doinita & Maria, 2015; Lloyd et al., 2014; McClendon

et al., 2017). Among Latinos, younger, unemployed, less acculturated parents tended to use authoritarian or controlling styles to promote physical activity (Arredondo et al., 2006; Ayala et al., 2010; Francis et al., 2001; Parada et al., 2016). Controlling parenting styles are associated with Latino children eating more unhealthy foods while reinforcing and monitoring parenting strategies have been positively associated with physical activity (Arredondo et al., 2006; McClendon et al., 2017). Parenting strategies, such as use of reinforcement, have also inversely affected body composition and child weight status, with control increasing child adiposity, and monitoring inversely affecting child adiposity (Brann & Skinner, 2005; Loth et al., 2013; Parada et al., 2016). Although previous studies have examined the influence of parenting strategies on eating and physical activity behaviors, previous research has not examined behavioral factors that may influence use of effective parenting strategies among rural, Mexican-heritage, *colonia* populations. McClendon and colleagues (2017) found that use of reinforcement, limit setting, and discipline were associated with higher levels of physical activity, decreased sedentary behaviors, and healthy eating behaviors within *colonia* populations. However, behavioral influences of parenting strategies have been largely understudied.

The American Heart Association has identified gaps within family-focused approaches (such as addressing lifestyle behaviors) to reduce obesity (Faith et al., 2012, p. 20). Self-regulation is the capacity to plan, guide, and monitor one’s behavior flexibly in the face of changing circumstances (J. Brown, 1998). The skill to self-regulate is negatively associated with BMI and positively associated with healthy eating habits (Bub et al., 2016). Self-regulation subconstructs such as goal setting and impulse control have been identified as

being necessary for behavior change (J. Brown, 1998; Neal & Carey, 2005; Rhodes & de Bruijn, 2013; Sanders et al., 2019). The importance of self-regulation regarding health behavior has been identified in established behavioral theories including the social cognitive theory, through Bandura's construct of self-control, also referred to as self-regulation, and the importance of increasing self-efficacy and behavioral participation through the concept of vicarious learning (modeling) (Bandura, 2004; Conner & Norman, 2015). Modeling has largely been operationalized as examining the influences of modeling the primary behavioral outcomes of interest (e.g., physical activity, eating behaviors) (Hennessy et al., 2010). Although mothers often report wanting to support healthy behaviors for children, they often do not have the skills, strategies, or resources to do so (Rhodes & de Bruijn, 2013). However, little evidence exists on how modeling of support behaviors (e.g., skills, strategies) by parents may influence the use of parenting strategies (Ah Hong et al., 2017).

Evidence has identified an intention-behavior gap between parents' intentions to support healthy behaviors for their children and being unable to employ these intentions with actions (being unable to turn intentions into behaviors that foster healthy decisions or effective parenting strategies) (Rhodes et al., 2016). This gap could be due to a lack of skills or strategies that would enhance easier engagement of parenting strategies. This intention-behavior gap highlights the importance of self-regulation in the maintenance of behavior and the need to investigate support behaviors as behaviors themselves (Rhodes et al., 2016).

Family Focused Programs

Family environment and family structure have been identified as a target for health

interventions (Kitzman-Ulrich et al., 2010). Family-focused health interventions align with values of *familism* (the importance of referents and family members as providers of support) and the common norms of Hispanic populations such as those within primarily Mexican-heritage *colonia* areas (Baker et al., 2019; Cowgill et al., 2014; Elder et al., 2009; Gruber & Haldeman, 2009; Kitzman-Ulrich et al., 2010). Family influences such as parental figures and parenting practices can affect dietary intake, screen time, and physical activity levels as evidenced among family-based interventions (Birch et al., 2001; Golan, 2006; Lloyd et al., 2014; Showell et al., 2013). However, systematic reviews on family-based interventions have found that family-focused interventions are not the most effective at sustaining positive health behaviors while also identifying family dynamics or parenting strategies as potential targets for programs (H. E. Brown et al., 2016; Taylor et al., 1994). Family-focused interventions target the need for modeling healthy behaviors rather than approaching family involvement in programs from a collectivistic approach where eating and physical activity are shared positive family experiences (H. E. Brown et al., 2016). Understanding the family environment and behaviors that support positive parenting strategies is critical for effective implementation and sustaining healthy behaviors among children.

Purpose Statement

The purpose of this study was to examine the association between mothers' self-regulation and use of parenting strategies of their children. Specifically, this study focused on the association between mothers' self-regulation, conceptualized through two independent variables, goal setting and impulse control, and parenting strategies, conceptualized through five dependent

variables: limit setting, monitoring, discipline, control, and reinforcement.

Methods

Sample

This study recruited mother-child dyads ($n = 121$ pairs) for a cross-sectional survey conducted in 2013 among south Texas-Mexico border populations in Hidalgo County, Texas. Institutional Review Board approval was received prior to study commencement. Surveys were administered by promotora-researchers (research methodology trained and/or certified community health workers (CHWs)). This study and the participants were part of an initial phase for an intervention that focused on healthy eating, physical activity, and family strategies among south Texas colonias; additional information about the larger study can be found elsewhere (McClendon et al., 2017; Prochnow et al., 2021; Prochnow et al., 2020). Mothers completed surveys that were translated into Spanish and interviewer-administered in the home (Larios et al., 2009; St. John et al., 2013). Mothers were asked questions concerning demographic characteristics (e.g., educational attainment and household income), and questions regarding parenting strategies and self-regulation.

Measures

Parenting strategies of limiting obesogenic behaviors. The parenting practices of mothers in regard to limiting obesogenic behaviors were measured using the Parenting Strategies for Eating and Activity Scale or PEAS (Larios et al., 2009). The PEAS is a measure designed to explain parenting strategies in relation to child eating and activity behaviors of diverse populations. The measure was originally designed through themes identified from a focus group

conducted with Latina mothers. The scale includes 26 items which are separated into five subscales: limit setting (Items 1-6), monitoring (Items 7-13), discipline (Items 14-18), control (Items 19-24), and reinforcement (Items 25-26). Items pertaining to limit setting included questions such as, “I limit the amount of time my child plays video games or is on the computer during the week,” and “I limit the amount of time my child plays video games or is on the computer during the weekend.” Monitoring items included wording such as, “How much do you keep track of the high fat foods your child eats?”; and “How much do you keep track of the amount of exercise your child is getting?” Items pertaining to discipline include wording such as, “How often do you discipline your child if she/he plays video games without any permission?”; and “How often do you discipline your child if she/he gets a snack without my permission?” Control was assessed using the following questions, “If I don’t regulate my child’s eating, he/she would eat much less,” and “My child should always eat all the food on his/her plate”. Finally, reinforcement items included wording such as, “How often do you praise your child for being physically active?”; and “How often do you praise your child for eating a healthy snack?” A 5-point Likert scale was used for response options ranging from “never” to “always.” Scoring for the scale included calculating the sum of each subscale as also described in a previous study (Ayala et al., 2010). The PEAS has been demonstrated to have strong reliability ($\alpha = 0.81$) (Larios et al., 2009).

Self-regulation. Mothers’ self-regulation was assessed using the Short Self-regulation Questionnaire (SSRQ). The SSRQ is a 21-item questionnaire adapted from the original Self-regulation Questionnaire (Neal & Carey, 2005). SSRQ items measure key concepts of self-regulation such as impulse control (SSRQ-IC) and goal setting (SSRQ-GS)

(Neal & Carey, 2005). Goal-setting items were measured on a 5-point Likert scale that ranged from “never” to “always” and included wording such as, “I usually keep track of progress toward my goals,” or “I’m able to accomplish goals I set for myself.” Items regarding impulse control were measured using a 5-point Likert scale that ranged from “strongly disagree” to “strongly agree” and included, “I don’t notice the effects of my actions until it’s too late,” or “It’s hard for me to notice when I’ve had enough (alcohol, food, sweets).” The SSRQ scale has been demonstrated to have high reliability for impulse control ($\alpha = 0.84$) and goal setting ($\alpha = 0.86$) (Neal & Carey, 2005).

Analyses. Means, standard deviations, and percentages were calculated for participant demographics, self-regulation scores, and parenting strategies scores. Correlational analyses were conducted between scores on self-regulation subscales (goal setting and impulse control) and parenting strategies subscales (limit setting, monitoring, discipline, control, and reinforcement). Multivariate regression analyses were conducted to identify whether any background or demographic variables interacted with the self-regulation and parenting strategies relationship. Analysis was performed using IBM SPSS Statistics for Windows, Version 26.0 (*IBM SPSS Statistics for Macintosh*, 2019).

Results

Please see Table 1 for baseline characteristics of mothers ($n = 121$). Mothers were married, on average 36 years old ($SD = 7.4$), and of Mexican origin (91.0%). Most reported having less than 9 years of education (67.0%) and less than \$1,000 in monthly income. Table 2 describes associations between maternal self-regulation scores and the use of parenting

strategies. Goal setting was significantly correlated with the use of limit setting ($r = .246, p < .001$), control ($r = .203, p = .03$), and monitoring ($r = .336, p < .001$) as parenting strategies.

In linear regression models, goal setting was a significant predictor for use of control ($\beta = .203, p = .03$), monitoring ($\beta = .336, p < .001$), and limit setting ($r = .246, p < .001$) parenting strategies. See Table 3 and Table 4 for further details from linear regression models examining goal setting and impulse control as predictors of control, monitoring, discipline, and reinforcement as parenting strategies. In multivariate regression models, goal setting remained a significant predictor for use of limit setting ($\beta = .26, p = .01$), control ($\beta = 0.22, p = .02$), and monitoring ($\beta = 0.34, p = .00$), even when accounting for birth country, education, race/ethnicity, and monthly income. Goal setting remained a significant predictor for use of control parenting strategies, when accounting for country of birth ($\beta = -0.22, p = .04$). See Table 5 for additional multivariate regression details.

Discussion

The purpose of this study was to analyze the relationship between maternal self-regulation through goal setting and impulse control and parenting strategies among Mexican-heritage mothers. Self-regulation through goal setting was associated with monitoring, control, and limit-setting parenting strategies.

In a previous study, McClendon et al. (2017) found that limit setting was associated with less screen time for children during the summer. Meanwhile, other studies have found that use of controlling, monitoring, and limit-setting parenting strategies were associated with lower BMI and a healthy diet, and less sedentary behavior (Larios et al., 2009; Lloyd et al., 2014; McClendon et al., 2017). Maternal self-regulation through goal

Table 1

Baseline Characteristics of Mothers

	Mean (SD)	<i>n</i>	%
Age (years)	36.9 (7.40)		
Country of Birth (<i>n</i> = 121)		121	
Mexico		110	91%
U.S.		11	9%
Education (<i>n</i> = 121)		121	
Less than 7 years		38	31%
7-9 years		44	36%
10/11 years		16	13%
12 or more years		23	19%
Race/Ethnicity (<i>n</i> = 121)		121	
Hispanic		26	21%
Mexican American		7	6%
Mexican		87	72%
Monthly Income (<i>n</i> = 116)			
< \$500		33	27%
\$500-\$999		51	42%
\$1000-\$1,499		21	17%
\$1500-\$1999		7	6%
\$2000-\$2999		3	2%
Do Not Know		1	1%
Marital Status (<i>n</i> = 116)			
Married or Living with Partner		96	83%
Not Married		20	17%
Self-regulation			
Goal setting	7.63 (1.04)	115	
Impulse Control	5.287(1.79)	115	
Parenting Strategies			
Limit Setting	2.88 (2.44)	115	
Control	1.96 (1.71)	113	
Discipline	1.60 (1.98)	116	
Reinforcement	1.00 (0.94)	116	
Monitoring	3.41(2.495)	115	

Table 2

Correlations Between Maternal Self-regulation and Parenting Strategies for Mexican-heritage Mothers

	Self-regulation	
	Goal setting	Impulse Control
Parenting Strategies		
Limit Setting	0.25**	0.10
Control	0.20*	0.10
Discipline	0.12	0.11
Monitoring	0.34**	0.14
Reinforcement	0.38	-0.05

Note. ** Indicates correlation is significant at the 0.01 level (2-tailed)

* Indicates correlation is significant at the 0.05 level (2-tailed)

setting could be useful for effective employment of parenting strategies such as monitoring, reinforcement, and control. Maternal self-regulation through goal setting could create a sense of agency in utilizing monitoring, reinforcement, and control as parenting strategies and supporting healthy behaviors. Moreover, it could be that parents are being asked to employ strategies or behaviors (i.e., parenting strategies to promote physical activity or nutrition) that they themselves have not developed or practiced. This could especially be true for lower socioeconomic status populations, or under-resourced areas where financial, familial, parental, and individual demands need to be met (Artazcoz et al., 2004). However, cultivating goal setting could be associated with the utilization of parenting strategies that support healthy behaviors within the family environment, for maternal figures and all members of the family. Maternal self-regulation through goal setting may be a barrier to parental support of healthy behaviors through parenting strategies. This relationship and these findings are specifically relevant for

interventions and health behavior theories that target parenting strategies. These findings may also be relevant for using family dynamics to engage strategies for parents to strengthen goal-setting skills which could facilitate eating and physical activity behaviors from a shared, positive, and family-oriented perspective. Given that use of self-regulation strategies such as impulse control and goal setting is associated with use of health-promoting parenting strategies, programs should consider incorporating strategies to implement these support behaviors rather than providing information on parenting strategies alone.

There are several limitations to this study. The use of the PEAS limits the ability to gauge a holistic perspective of parenting strategies. Future research should also include additional parenting strategies and styles. In addition, although prioritization of goal setting may be useful, the SSRQ-IC only measures only two self-regulation conceptual strategies and the extent of goal setting, not strategies that can be employed to engage in effective goal setting. It is important to acknowledge the dated nature of this data as

a limitation. However, the relationships examined and the context for the population are still relevant as more evidence pertaining to use of parenting strategies is needed to inform family-focused interventions and this growing area of research (H. E. Brown et al., 2016; Golan, 2006; McClendon et al., 2017). Self-regulation and changes in use of parenting strategies is relevant for health behavior research and even more important to consider in today's family health environment where use of specific parenting strategies can act as protective factors during natural disasters such as a pandemic (Coyne et al., 2021; Oliveira et al., 2022; Wong et al., 2020). Replicating future data collection efforts should examine the effects of the pandemic and other related stressors on the relationship between self-regulation and parenting strategies for colonia populations. Future research should include and examine the role of additional self-regulatory strategies pertaining to support behaviors that are typically applied to behavioral outcomes like physical activity (e.g., self-monitoring, time management, eliciting self-support, reinforcement) (Umstattd et al., n.d.). More evidence is also needed to identify goal-setting strategies that may be useful for engaging in family-oriented health behaviors (e.g., hierarchical goal setting, using the SMART: Specific, Measurable, Attainable, Realistic, Timely strategy for goal setting) (Bailey, 2017). This study contributes to understanding the role of self-regulation strategies for engagement in parenting strategies for Mexican-heritage mothers residing along the Texas-Mexico border. To our knowledge, this is the first study to evaluate the relationship of a support behavior, such as maternal self-regulation, and parenting strategies to enhance health behaviors.

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Table 3

Associations between Maternal Self-regulation as a Predictor for Control, Monitoring, and Discipline

	Parenting Strategy											
	Control				Monitoring				Discipline			
	B (SE)	R ²	β	p	B (SE)	R ²	β	p	B (SE)	R ²	β	p
Model		0.03				0.11				0.01		
Intercept	-0.57 (1.18)	-	-	0.63	-2.75 (1.64)	-	-	0.10	-0.08 (1.38)	-	-	0.96
Goal Setting	0.33 (0.15)	-	0.20	0.03	0.81 (0.21)	-	0.34	0.00	0.22 (0.18)	-	0.12	0.22
Model		0.00				0.01				0.00		
Intercept	1.48 (0.50)	-	-	0.00	0.24 (0.74)	-	-	0.00	0.97 (0.58)	-	-	0.10
Impulse Control	0.09 (0.09)	-	0.10	0.30	0.20 (0.13)	-	0.14	0.13	0.12 (0.10)	-	0.11	0.24

Note. Linear regressions model maternal self-regulation as a predictor for parenting strategies. Bold font indicates statistical significance at the two-sided $\alpha = 0.05$ level.

Table 4

Associations Between Maternal Self-regulation as a Predictor for Reinforcement and Limit Setting

	Parenting Strategy							
	Reinforcement				Limit Setting			
	B (SE)	R ²	β	p	B (SE)	R ²	β	p
Model		-0.01	-0.01				0.05	
Intercept	1.28 (0.65)	-	-	0.05	-1.59 (1.70)	-	-	0.35
Goal Setting	-0.04 (0.09)	-	0.06	0.68	0.59 (0.22)	-	0.25	0.01
Model		-0.01	-0.01				0.00	
Intercept	1.18 (0.28)	-	-	0.00	2.23 (0.71)	-	-	0.00
Impulse Control	-0.03 (0.05)	-	-0.05	0.59	0.13 (0.13)	-	0.10	0.32

Note. Linear regressions model maternal self-regulation as a predictor for parenting strategies. Bold font indicates statistical significance at the two-sided $\alpha = 0.05$ level.

Table 5

Associations Between Maternal Self-regulation through Goal Setting as a Predictor for Parenting Strategies

	Parenting Strategies											
	Limit Setting				Control				Monitoring			
	R^2	B (SE)	β	p	R^2	B (SE)	β	p	R^2	B (SE)	β	p
Model	0.047				0.05				0.14			
Intercept		-0.73 (2.02)	-	0.72		0.93 (1.43)	-	0.52		-1.60 (1.99)	-	0.43
Goal setting		0.61 (0.22)	0.26	0.01		0.36 (0.16)	0.22	0.02		0.82 (0.22)	0.34	0.00
Birth Country		-0.25 (0.87)	-0.03	0.29		-1.23 (0.62)	-0.22	0.04		-1.47 (0.86)	-0.18	0.09
Education		0.26 (0.24)	0.11	0.29		0.02 (0.16)	0.01	0.90		-0.26 (0.23)	-0.11	0.27
Race/Ethnicity		-0.12 (0.28)	-0.42	0.66		-0.01 (.20)	-0.01	0.95		0.03 (0.28)	0.01	0.91
Monthly Income		-0.26 (0.21)	-0.12	0.22		-0.17 (0.15)	-0.11	0.27		0.11 (0.21)	0.05	0.61

Note. Multivariate regressions model maternal self-regulation through goal setting as a predictor for limit setting, control and monitoring as parenting strategies. Bold font indicates statistical significance at the two-sided $\alpha = 0.05$ level.

residing along the Texas-Mexico border. To our knowledge, this is the first study to evaluate the relationship of a support behavior, such as maternal self-regulation, and parenting strategies to enhance health behaviors.

Acknowledgments

We acknowledge and thank the participants of this study, the promotora-researchers, and other research team members for their time, effort, and willingness on this project. Specifically, we acknowledge the time and leadership of promotora-researchers Elva Belterra and Maria Garza; and data management by Susannah Barr, Jasmin Sumrall, and Shana Walsh. This project was supported through two funding mechanisms: Baylor University, Young Investigator Development Program Grant (2013-2014) and USDA-NIFA (#2015-68001-23234). The authors have no conflicts of interest to declare.

Discussion Questions

1. When considering the two self-regulation strategies included in this study, goal setting and impulse control, how do you think these relationships would differ if Mexican-heritage fathers were the respondents?
2. Although not measured directly in this study, how do you think cultural norms should be considered when designing intervention components to enhance self-regulation and parenting strategies for improving physical activity and eating behaviors among Mexican-heritage families?

References

- Ah Hong, S., Peltzer, K., & Wimonpeerapattana, W. (2017). Impact of self-efficacy and parenting practice on physical activity among school children. *Nagoya Journal of Medical Science*, 79(3), 339-349.
<https://doi.org/10.18999/nagjms.79.3.339>
- Arredondo, E. M., Elder, J. P., Ayala, G. X., Campbell, N., Baquero, B., & Duerksen, S. (2006). Is parenting style related to children's healthy eating and physical activity in Latino families? *Health Education Research*, 21(6), 862-871.
<https://doi.org/10.1093/her/cyl110>
- Arroyo-Johnson, C., & Mincey, K. D. (2016). Obesity epidemiology trends by race/ethnicity, gender, and education: National Health Interview Survey, 1997–2012. *Gastroenterology Clinics of North America*, 45(4), 571-579.
<https://doi.org/10.1016/j.gtc.2016.07.012>
- Artazcoz, L., Borrell, C., Benach, J., Cortés, I., & Rohlfs, I. (2004). Women, family demands, and health: The importance of employment status and socio-economic position. *Social Science & Medicine*, 59(2), 263-274.
<https://doi.org/10.1016/j.socscimed.2003.10.029>
- Ayala, G. X., Elder, J. P., Campbell, N. R., Arredondo, E., Baquero, B., Crespo, N. C., & Slymen, D. J. (2010). Longitudinal intervention effects on parenting of the Aventuras para Niños study. *American Journal of Preventive Medicine*, 38(2), 154-162.
<https://doi.org/10.1016/j.amepre.2009.09.038>

- Bailey, R. R. (2017). Goal setting and action planning for health behavior change. *American Journal of Lifestyle Medicine*, 13(6), 615-618.
<https://doi.org/10.1177/1559827617729634>
- Baker, S., Morawska, A., & Mitchell, A. (2019). Promoting children's healthy habits through self-regulation via parenting. *Clinical Child and Family Psychology Review*, 22, 52-62.
<https://doi.org/10.1007/s10567-019-00280-6>
- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, 31(2), 143-164.
<https://doi.org/10.1177/1090198104263660>
- Birch, L. L., Fisher, J. O., Grimm-Thomas, K., Markey, C. N., Sawyer, R., & Johnson, S. L. (2001). Confirmatory factor analysis of the Child Feeding Questionnaire: A measure of parental attitudes, beliefs and practices about child feeding, and obesity proneness. *Appetite*, 36(3), 201-210.
<https://doi.org/10.1006/appe.2001.0398>
- Brann, L. S., & Skinner, J. D. (2005). More controlling child-feeding practices are found among parents of boys with an average body mass index compared with parents of boys with a high body mass index. *Journal of the Academy of Nutrition and Dietetics*, 105(9), 1411-1416.
<https://doi.org/10.1016/j.jada.2005.06.005>
- Brown, H. E., Atkin, A. J., Panter, J., Wong, G., Chinapaw, M. J. M., & van Sluijs, E. M. F. (2016). Family-based interventions to increase physical activity in children: A systematic review, meta-analysis, and realist synthesis. *Obesity Reviews*, 17(4), 345-360.
<https://doi.org/10.1111/obr.12362>
- Brown, J. Brown, J. M. (1998). Self-regulation and the addictive behaviors. In *Treating addictive behaviors* (2nd ed.), (pp. 61-73). Plenum Press.
https://doi.org/10.1007/978-1-4899-1934-2_5
- Bub, K. L., Robinson, L. E., & Curtis, D. S. (2016). Longitudinal associations between self-regulation and health across childhood and adolescence. *Health Psychology*, 35(11), 1235-1245.
<https://doi.org/10.1037/hea0000401>
- Castañeda, H. (2016). [Review of the book *The colonias reader: Economy, housing, and public health in U.S.-Mexico border colonias*, by A. X. Esparza & A. J. Donelson, eds.]. *The Journal of Latin American and Caribbean Anthropology*, 21(1), 203-204.
<https://doi.org/10.1111/jlca.12205>
- Centers for Disease Control and Prevention (CDC). (2019, January 31). *Adult Obesity Prevalence Maps*.
<http://www.cdc.gov/obesity/data/adult.html>
- Conner, M., & Norman, P. (2015). *Predicting and changing health behaviour: Research and practice with social cognition models* (3rd ed.). Open University Press.
- Coronado, G. D., Farias, A., Thompson, B., Godina, R., & Oderkirk, W. (2006). Attitudes and beliefs about colorectal cancer among Mexican Americans in communities along the U.S.-Mexico border. *Ethnicity & Disease*, 16(2), 421-427.

- Cowgill, B. O., Chung, Paul. J., Thompson, L. R., Elijah, J., Lamb, S., Garcia, V. P., & Bastani, R. (2014). Parents' views on engaging families of middle school students in obesity prevention and control in a multiethnic population. *Preventing Chronic Disease, 11*, Article 130138. <https://doi.org/10.5888/pcd11.130138>
- Coyne, L. W., Gould, E. R., Grimaldi, M., Wilson, K. G., Baffuto, G., & Biglan, A. (2021). First things first: Parent psychological flexibility and self-compassion during COVID-19. *Behavior Analysis in Practice, 14*(4), 1092-1098. <https://doi.org/10.1007/s40617-020-00435-w>
- Doinita, N. E., & Maria, N. D. (2015). Attachment and parenting styles. *Procedia - Social and Behavioral Sciences, 203*, 199-204. <https://doi.org/10.1016/j.sbspro.2015.08.282>
- Elder, J. P., Ayala, G. X., Slymen, D. J., Arredondo, E. M., & Campbell, N. R. (2009). Evaluating psychosocial and behavioral mechanisms of change in a tailored communication intervention. *Health Education & Behavior, 36*(2), 366-380. <https://doi.org/10.1177/1090198107308373>
- Faith, M. S., Van Horn, L., Appel, L. J., Burke, L. E., Carson, J. A. S., Franch, H. A., Jakicic, J. M., Kral, T. V. E., Odoms-Young, A., Wansink, B., Wylie-Rosett, J. (American Heart Association Nutrition and Obesity Committees of the Council on Nutrition, Physical Activity, and Metabolism, Council on Clinical Cardiology, Council on Cardiovascular Disease in the Young, Council on Cardiovascular Nursing, Council on Epidemiology and Prevention, and Council on the Kidney in Cardiovascular Disease). (2012). Evaluating parents and adult caregivers as "agents of change" for treating obese children: Evidence for parent behavior change strategies and research gaps: A scientific statement from the American Heart Association. *Circulation, 125*(9), 1186-1207. <https://doi.org/10.1161/CIR.0b013e31824607ee>
- Fernández, M. E., Savas, L. S., Carmack, C. C., Chan, W., Lairson, D. R., Byrd, T. L., Wilson, K. M., Arvey, S. R., Krasny, S., & Vernon, S. W. (2015). A randomized controlled trial of two interventions to increase colorectal cancer screening among Hispanics on the Texas–Mexico border. *Cancer Causes & Control, 26*(1), 1-10. <https://doi.org/10.1007/s10552-014-0472-5>
- Francis, L. A., Hofer, S. M., & Birch, L. L. (2001). Predictors of maternal child-feeding style: Maternal and child characteristics. *Appetite, 37*(3), 231-243. <https://doi.org/10.1006/appe.2001.0427>
- Golan, M. (2006). Parents as agents of change in childhood obesity—From research to practice. *International Journal of Pediatric Obesity, 1*(2), 66-76. <https://doi.org/10.1080/17477160600644272>
- Gruber, K. J., & Haldeman, L. A. (2009). Using the family to combat childhood and adult obesity. *Preventing Chronic Disease, 6*(3), Article A106.
- Hennessy, E., Hughes, S. O., Goldberg, J. P., Hyatt, R. R., & Economos, C. D. (2010). Parent-child interactions and objectively measured child physical activity: A cross-sectional study. *The International Journal*

- of Behavioral Nutrition and Physical Activity*, 7, Article 71.
<https://doi.org/10.1186/1479-5868-7-71>
- Hernandez, A. A. (2011). *Gente a favor de gente*—People helping people: Assessing a child development intervention in colonias in Ciudad Juárez, Mexico. *Children, Youth and Environments*, 21(2), 184-194.
<https://www.jstor.org/stable/10.7721/chilyoutenvi.21.2.0184>
- IBM SPSS Statistics for Macintosh (26.0). (2019). IBM Corp.
- James, C. V., Moonesinghe, R., Wilson-Frederick, S. M., Hall, J. E., Penman-Aguilar, A., & Bouye, K. (2017). Racial/ethnic health disparities among rural adults—United States, 2012-2015. *Morbidity and Mortality Weekly Report (MMWR). Surveillance Summaries*, 66(SS-23), 1-9.
<https://doi.org/10.15585/mmwr.ss6623a1>
- Kaplan, M. S., Hugueta, N., Newsom, J. T., & McFarland, B. H. (2004). The association between length of residence and obesity among Hispanic immigrants. *American Journal of Preventive Medicine*, 27(4), 323-326.
<https://doi.org/10.1016/j.amepre.2004.07.005>
- Kitzman-Ulrich, H., Wilson, D. K., St. George, S. M., Lawman, H., Segal, M., & Fairchild, A. (2010). The integration of a family systems approach for understanding youth obesity, physical activity, and dietary programs. *Clinical Child and Family Psychology Review*, 13(3), 231-253.
<https://doi.org/10.1007/s10567-010-0073-0>
- Larios, S. E., Ayala, G. X., Arredondo, E. M., Baquero, B., & Elder, J. P. (2009). Development and validation of a scale to measure Latino parenting strategies related to children's obesigenic behaviors. The parenting strategies for eating and activity scale (PEAS). *Appetite*, 52(1), 166-172.
<https://doi.org/10.1016/j.appet.2008.09.011>
- Lloyd, A. B., Lubans, D. R., Plotnikoff, R. C., Collins, C. E., & Morgan, P. J. (2014). Maternal and paternal parenting practices and their influence on children's adiposity, screen-time, diet, and physical activity. *Appetite*, 79, 149-157.
<https://doi.org/10.1016/j.appet.2014.04.010>
- Loth, K. A., MacLehose, R. F., Fulkerson, J. A., Crow, S., & Neumark-Sztainer, D. (2013). Food-related parenting practices and adolescent weight status: A population-based study. *Pediatrics*, 131(5), e1443-e1450.
<https://doi.org/10.1542/peds.2012-3073>
- Marín, G., & Marín, B. V. (1991). *Research with Hispanic populations*. SAGE Publications, Inc.
<https://doi.org/10.4135/9781412985734>
- McClendon, M. E., Umstattd Meyer, M. R., Ylitalo, K. R., & Sharkey, J. R. (2017). Physical activity of Mexican-heritage youth during the summer and school-year: The role of parenting strategies. *Journal of Community Health*, 42(6), 1102-1110.
<https://doi.org/10.1007/s10900-017-0358-z>
- Mier, N., Smith, M. L., Irizarry, D., Carrillo-Zuniga, G., Lee, C., Trevino, L., & Ory, M. G. (2013). Bridging research and

- policy to address childhood obesity among border Hispanics: A pilot study. *American Journal of Preventive Medicine*, 44(3, Supplement 3), S208-S214. <https://doi.org/10.1016/j.amepre.2012.11.013>
- Nalty, C., Sharkey, J. R., & Dean, W. R. (2013). School-based nutrition programs are associated with reduced child food insecurity in a longitudinal study among Mexican-origin mother child dyads in Texas border colonias. *The FASEB Journal*, 27(S1), 369.3-369.3. https://doi.org/10.1096/fasebj.27.1_supplement.369.3
- Neal, D. J., & Carey, K. B. (2005). A follow-up psychometric analysis of the self-regulation questionnaire. *Psychology of Addictive Behaviors*, 19(4), 414-422. <https://doi.org/10.1037/0893-164X.19.4.414>
- NICHQ (National Institute for Children's Health Quality). (n.d.). *Obesity Factsheets*. NICHQ - National Institute for Children's Health Quality. Retrieved April 22, 2019, from <https://www.nichq.org/resource/obesity-factsheets>
- Oliveira, T. D. O., Costa, D. S., Alvim-Soares, A., de Paula, J. J., Kestelman, I., Silva, A. G., Malloy-Diniz, L. F., & Miranda, D. M. (2022). Children's behavioral problems, screen time, and sleep problems' association with negative and positive parenting strategies during the COVID-19 outbreak in Brazil. *Child Abuse & Neglect*, 130(1), Article 105345. <https://doi.org/10.1016/j.chiabu.2021.105345>
- Parada, H., Jr., Ayala, G. X., Horton, L. A., Ibarra, L., & Arredondo, E. M. (2016). Latino fathers' feeding-related parenting strategies on children's eating. *Ecology of Food and Nutrition*, 55(3), 292-307. <https://doi.org/10.1080/03670244.2016.1161616>
- Prochnow, T., Umstattd Meyer, M. R., Johnson, C., Delgado, H., Gómez, L., & Sharkey, J. R. (2021). The development and pilot testing of the ¡Haz Espacio Para Papi! program physical activity curriculum for Mexican-heritage fathers and children. *American Journal of Health Education*, 52(3), 145-153. <https://doi.org/10.1080/19325037.2021.1902888>
- Prochnow, T., Umstattd Meyer, M. R., Patterson, M. S., McClendon, M. E., Gómez, L., Trost, S. G., & Sharkey, J. R. (2020). Papás activos: Associations between physical activity, sedentary behavior, and personal networks among fathers living in Texas colonias. *International Journal of Environmental Research and Public Health*, 17(24), 9243. <https://doi.org/10.3390/ijerph17249243>
- Ramos, I. N., May, M., & Ramos, K. S. (2001). Environmental health training of promotoras in colonias along the Texas-Mexico border. *American Journal of Public Health*, 91(4), 568-570. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1446654/>
- Rhodes, R. E., & de Bruijn, G.-J. (2013). How big is the physical activity intention-behaviour gap? A meta-analysis using the action control framework. *British Journal of Health Psychology*, 18(2), 296-309. <https://doi.org/10.1111/bjhp.12032>
- Rhodes, R. E., Spence, J. C., Berry, T., Deshpande, S., Faulkner, G., Latimer-

- Cheung, A. E., O'Reilly, N., & Tremblay, M. S. (2016). Understanding action control of parental support behavior for child physical activity. *Health Psychology, 35*(2), 131-140.
<https://doi.org/10.1037/hea0000233>
- Sanders, M. R., Turner, K. M. T., & Metzler, C. W. (2019). Applying self-regulation principles in the delivery of parenting interventions. *Clinical Child and Family Psychology Review, 22*, 24-42.
<https://doi.org/10.1007/s10567-019-00287-z>
- Sharkey, J. R., Dean, W. R., & Johnson, C. M. (2011). Association of household and community characteristics with adult and child food insecurity among Mexican-origin households in colonias along the Texas-Mexico border. *International Journal for Equity in Health, 10*(1), Article 19. <https://doi.org/10.1186/1475-9276-10-19>
- Sharkey, J. R., Dean, W. R., Nalty, C. C., & Xu, J. (2013). Convenience stores are the key food environment influence on nutrients available from household food supplies in Texas Border colonias. *BMC Public Health, 13*(1), Article 45.
<https://doi.org/10.1186/1471-2458-13-45>
- Sharkey, J. R., Johnson, C. M., & Dean, W. R. (2011). Nativity is associated with sugar-sweetened beverage and fast-food meal consumption among Mexican-origin women in Texas border colonias. *Nutrition Journal, 10*(1), Article 101.
<https://doi.org/10.1186/1475-2891-10-101>
- Sharkey, J. R., Nalty, C., Johnson, C. M., & Dean, W. R. (2012). Children's very low food security is associated with increased dietary intakes in energy, fat, and added sugar among Mexican-origin children (6-11 y) in Texas border colonias. *BMC Pediatrics, 12*, Article 16.
<https://doi.org/10.1186/1471-2431-12-16>
- Showell, N. N., Fawole, O., Segal, J., Wilson, R. F., Cheskin, L. J., Bleich, S. N., Wu, Y., Lau, B., & Wang, Y. (2013). A systematic review of home-based childhood obesity prevention studies. *Pediatrics, 132*(1), e193-e200.
<https://doi.org/10.1542/peds.2013-0786>
- St. John, J. A., Johnson, C. M., Sharkey, J. R., Dean, W. R., & Arandia, G. (2013). Empowerment of promotoras as promotora-researchers in the *Comidas Saludables & Gente Sana en las Colonias del Sur de Tejas* (Healthy Food and Healthy People in South Texas Colonias) program. *The Journal of Primary Prevention, 34*(1-2), 41-57.
<https://doi.org/10.1007/s10935-013-0296-1>
- Tamayo, M. C., Dobbs, P. D., & Pincu, Y. (2021). Family-centered interventions for treatment and prevention of childhood obesity in Hispanic families: A systematic review. *Journal of Community Health, 46*(3), 635-643.
<https://doi.org/10.1007/s10900-020-00897-7>
- Taylor, W. C., Baranowski, T., & Sallis, J. F. (1994). Family determinants of childhood physical activity: A social-cognitive model. In R. K. Dishman (Ed.), *Advances in exercise adherence* (pp. 319-342). Human Kinetics Publishers.
- Umstadd, M. R., Motl, R., Wilcox, S., Saunders, R., & Watford, M. (n.d.). Measuring physical activity self-regulation strategies in older adults.

Journal of Physical Activity and Health,
6(s1), S105-S112.

<https://doi.org/10.1123/jpah.6.s1.s105>

Umstatted Meyer, M. R., Sharkey, J. R.,
Patterson, M. S., & Dean, W. R. (2013).
Understanding contextual barriers,
supports, and opportunities for physical
activity among Mexican-origin children in
Texas border colonias: A descriptive
study. *BMC Public Health*, 13(1), Article
14. [https://doi.org/10.1186/1471-2458-
13-14](https://doi.org/10.1186/1471-2458-13-14)

Vincent, V., & Guinn, R. (2001).
Effectiveness of a colonia educational

iIntervention. *Hispanic Journal of
Behavioral Sciences*, 23(2), 229-238.

[https://doi.org/10.1177/07399863012320
07](https://doi.org/10.1177/0739986301232007)

Wong, C. A., Ming, D., Maslow, G., &
Gifford, E. J. (2020). Mitigating the
impacts of the COVID-19 pandemic
response on at-risk children. *Pediatrics*,
146(1), e20200973.

<https://doi.org/10.1542/peds.2020-0973>

Zambrana, R. E. (Ed.) (1995). *Understanding
Latino families: Scholarship, policy and
practice*. Sage Publications.