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The Associations of Eating-related Attitudinal Balance with Psychological Well-being and Eating Behaviors

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Abstract

This study used balance theory to illuminate the relations of eating-related attitudinal consistency between self and friends to psychological well-being and eating behaviors. It was hypothesized that attitudinal inconsistency, relative to consistency, would predict lower well-being and poorer eating habits. A population-based sample of 2287 young adults participating in Project EAT-III (Eating Among Teens and Young Adults) completed measures of psychological well-being, eating behaviors, and eating-related attitudes from the standpoint of self and friends. Of participants who cared about healthy eating, those who perceived that their friends did not care about healthy eating had lower well-being and less-healthy eating behaviors (fewer fruits and vegetables and more sugary beverages per day) than those who perceived that their friends cared about healthy eating. Conversely, among participants who did not care about healthy eating, those who perceived that their friends cared about healthy eating had lower well-being and less-healthy eating behaviors (more snacks per day) than those who perceived that their friends did not care about healthy eating. In accord with balance theory, young adults who perceived inconsistent eating attitudes between themselves and their friends had lower psychological well-being and generally less-healthy eating behaviors than people who perceived consistent eating attitudes.

Keywords

balance theory; well-being; eating attitudes; eating behavior

The present investigation applies balance theory (Heider, 1958) to illuminate the relations of eating attitudes (from the standpoint of self and friends) to eating behaviors and psychological well-being. By bringing balance theory to bear, we seek to answer questions such as: Does it matter psychologically or behaviorally if one perceives consistency or inconsistency with friends about the importance of healthy eating? When might having friends who care about healthy eating be associated with healthy eating behaviors? When

might having such friends be associated with unhealthy eating behaviors? Prior research on the effect of social influence on eating attitudes and behaviors tends to be inconsistent and varies substantially in magnitude (e.g., Ali, Amialchuk, & Heiland, 2011; Emmons, Barbeau, Gutheil, Stryker, & Stoddard, 2007; Feunekes et al., 1998; for a review see Larson & Story, 2009). Furthermore, beyond attitudes related to disordered eating and unhealthy weight control strategies (e.g., Paxton, Schultz, Wertheim, & Muir, 1999; Thompson et al., 2007), little research has considered the relation of attitudes about healthy eating (from the standpoint of self or friends) to psychological well-being. Utilizing balance theory, the present investigation seeks to address these concerns and gaps in the literature.

Theories of cognitive consistency (e.g., cognitive dissonance, Festinger, 1957; balance theory, Heider, 1958) propose that cognitions about the world, oneself, one's actions, and other people tend to exist in a consistent or harmonious state. When inconsistencies arise, whether they involve one's beliefs and actions or one's beliefs and the beliefs of an important other, they produce an uncomfortable psychological state of tension, which can lead to changing one's cognitions, behaviors, or the cognitions of others. Although theories of cognitive consistency have received much empirical attention in the laboratory, relatively little research has investigated the impacts of inconsistencies in people's daily lives and social worlds (for an exception, see Davis & Rusbult, 2001), and we know of no research using a population-based sample to investigate these processes.

Balance theory (Heider, 1958) proposes that we seek consistency in our interpersonal relationships. Specifically, we want to agree with people we like and disagree with people we dislike. The most often studied aspect of balance theory considers sentiment triads that consist of two people and an attitude object. For example, if two people are friends (a positive sentiment), but one person is a proponent of healthy eating (a positive sentiment) and the other is not a proponent of healthy eating (a negative sentiment), then the situation is unbalanced. To resolve or lessen the imbalance, one person could change her or his attitude, each person could compartmentalize or downplay the importance of the disagreement, or the two people could come to dislike one another or cease to have a relationship. However, these latter scenarios are probably not viable options in the case of friends or family members.

In testing balance theory, the main research paradigm has been to expose participants to sentiment triads such as the scenario described above and to elicit ratings of pleasantness, consistency, and/or expectedness (for a review see Zajonc, 1968). Research has generally supported the idea that balance is preferred over imbalance, particularly when participants are highly motivated (e.g., when issues are important/relevant, when the other is a friend; Cacioppo & Petty, 1981; Davis & Rusbult, 2001; Newcomb, 1959). Newcomb (1953) proposed that movement towards attitudinal consistency is a persistent force because people want to hold correct attitudes (informational social influence) and want to be liked (normative social influence). To the extent that one does not perceive consensus, one should experience psychological tension.

In prior research on balance processes in people's social worlds, Fuglestad (2010) examined the relation of attitudinal inconsistency with close others (e.g., different views than one's friends regarding life-guiding values) to relationship functioning and psychological well-being. Across multiple studies, inconsistency with friends and romantic partners regarding life-guiding values was associated with less relational and personal well-being. Although attitudes about eating may be less central to self than life-guiding values, eating is integral to daily life, social relationships, and culture in general (e.g., Rozin, 1999; Rozin, Bauer, & Catanese, 2003). In fact, Rozin (1999) has argued that healthy eating is becoming an increasingly moral issue, similar to drug use or smoking, with clear proscriptions and

prescriptions about how one ought to eat. Therefore, we hypothesized that attitudinal inconsistencies between self and friends regarding healthy eating would be negatively associated with well-being. Furthermore, we predicted that the impact of inconsistencies would be most pronounced for women and people who are overweight as eating attitudes and behaviors tend to be most salient for women and overweight people (Castellanos et al., 2009; Rozin et al., 2003; Vander Wal & Thelen, 2000).

The associations among the eating behaviors and attitudes of social network members are not always unequivocal (e.g., Ali et al., 2011; Emmons et al., 2007; Feunekes et al., 1998; Larson & Story, 2009). For example, Feunekes et al. (1998) found food intake to be generally unrelated among friends (e.g., among both adolescent and adult friend pairs, <20% of foods on a food frequency questionnaire were associated). Emmons et al. (2007) found that perceptions of social norms regarding fruit and vegetable intake were related to fruit and vegetable intake in one adult sample (recruited from health centers), but not in another sample (recruited from small businesses). Using data from the National Longitudinal Survey of Adolescent Health, Ali et al. (2011) found peer effects for fast-food consumption, but not for consumption of breakfast, fruits and vegetables, or calorie-dense snacks.

Balance theory has the potential to shed light on these findings by specifying under what conditions to expect strong versus weak or positive versus negative associations among friends' eating behaviors and attitudes. From a balance perspective, the influence of friends should depend on one's own attitude. We hypothesized that for people who care about healthy eating, perceiving that friends also care about healthy eating would be related to healthier eating behaviors than perceiving that friends do not care. This hypothesis is in concert with theory and research on social influence (e.g., Golan, Schwarzfuchs, Stampfer, & Shai, 2010; Leahey, Kumar, Weinberg, & Wing, 2012; Woodard, Encarnacion, Peraza, Hernandez-Boussard, & Morton, 2011) and perceived norms (e.g., Neighbors, Lewis, Bergstrom, & Larimer, 2006; Neighbors et al., 2008, 2010a, 2010b). However, from a balance perspective, for those who do not care about healthy eating, perceiving that friends care about healthy eating may be interpreted as judgmental or threatening, and these individuals may react by discounting the attitudes of friends or by behaving in unhealthy ways (i.e. bolstering consistency between self-attitudes and behaviors). These findings have the potential to inform interventions that rely on social influence and modeling to affect behavior. If the influence of others' eating behaviors depends on one's own attitude about healthy eating, then self-attitudes will need to be accounted for and addressed in intervention procedures.

The present investigation seeks to determine whether the psychological well-being and eating behaviors of young adults are related to perceptions of friends' attitudes about healthy eating and whether or not these relations are dependent on one's own attitude about healthy eating. Drawing on balance theory, the following hypotheses were posited:

- Attitudinal inconsistency between self and friends regarding healthy eating will be negatively associated with well-being.
- Attitudinal inconsistency, relative to consistency, between self and friends regarding healthy eating will be related to less healthy eating among participants.
- The association of attitudinal inconsistency with well-being will be most pronounced for women and people who are overweight as eating attitudes and behaviors tend to be most salient for women and overweight people (Castellanos et al., 2009; Rozin et al., 2003; Vander Wal & Thelen, 2000). No hypotheses were posited regarding moderators of the association between attitudinal inconsistency and healthy eating.

Method

Study Design and Population

Project EAT (Eating Among Teens and Young Adults) is a study on the determinants of dietary intake and weight status among adolescents and young adults (e.g., Neumark-Sztainer, Larson, Fulkerson, Eisenberg, & Story, 2010; Neumark-Sztainer, Story, Hannan, & Moe, 2002; Neumark-Sztainer, Wall, Story, & van den Berg, 2008). In Project EAT-I, middle school (younger cohort) and high school (older cohort) students from 31 Minnesota schools completed surveys and anthropometric measures. Projects EAT-II and III resurveyed the original participants 5 and 10 years later, respectively. In the present study, we focused on young adults as friends should play an important role in their daily lives and their eating behaviors should be less constrained by direct family structure and influence as compared to adolescents (Ali et al., 2011; Lau, Quadrel, & Hartman, 1990). Young adult participants ($N = 2287$; age $M = 25.3$ years; 55% women; 64% white, 8% black, 3% Hispanic, 16% Asian, 2% Native American, 7% other or mixed-race) completed Project EAT-III surveys from October 2008–October 2009. Consent was obtained from all participants and the University of Minnesota's Institutional Review Board Human Subjects Committee approved all protocols.

Propensity weighting—Participation at EAT-I and EAT-III was not equal across socio-demographic groups; thus, the data were weighted using the response propensity method so that estimates were generalizable to a population with the original demographic makeup (Little, 1986). The original sample came from a large number of public schools, and as such, reflected the diversity/population make-up of the participating school districts. The weighted racial/ethnic proportions of this population were: 48.4% white, 18.6% African American, 19.6% Asian, 5.9% Hispanic, 3.3% Native American, and 4.2% mixed or other race/ethnicity. The SES proportions were: 18.0% low, 19.0% low-middle, 26.2% middle, 23.3% upper-middle, and 13.5% high. Those who participated in EAT-III and those who did not participate were similar at EAT-I in terms of healthy eating attitudes ($M = 3.1$, $SD = 0.7$ versus $M = 3.0$, $SD = 0.8$), perception of friends' healthy eating attitudes ($M = 2.9$, $SD = 1.1$ versus $M = 2.9$, $SD = 1.3$), BMI ($M = 23.0$, $SD = 4.6$ versus $M = 23.3$, $SD = 5.1$), psychological well-being (e.g., depression: $M = 10.4$, $SD = 2.8$ versus $M = 10.2$, $SD = 2.8$), and eating behaviors (e.g., fast food in the past week: $M = 2.0$, $SD = 0.9$ versus $M = 2.1$, $SD = 1.0$).

Measures

Eating attitudes—Participants responded to two survey items about their own and their friends' attitudes toward healthy eating: 1) "How much do you care about healthy eating?" and 2) "Many of my friends care about eating healthy food." The respective responses to these two items were *not at all* [$n(1) = 50$, $n(2) = 250$], *a little bit* [$n(1) = 269$, $n(2) = 501$], *somewhat* [$n(1) = 1086$, $n(2) = 987$], and *very much* [$n(1) = 882$, $n(2) = 479$]. For perceptions of friends' attitude, participants could also choose *I don't know* ($n = 57$); these participants were excluded from analysis. In a sample of 66 young adults who completed the EAT-III questionnaire twice over 1 to 3 weeks, these two items had test-retest Spearman r 's of .62 and .58 respectively. Based on the number of participants choosing the various response options (e.g., very few choosing *not at all*), and the overall data patterns (i.e. patterns of means for both psychological and behavioral variables were similar among those choosing *not at all* and *a little bit* and those choosing *somewhat* and *very much*), we classified *not at all* or *a little bit* as not caring about healthy eating and *somewhat* or *very much* as caring about healthy eating. Using this classification scheme, 86% of participants cared about healthy eating, and 66% perceived that their friends cared about healthy eating. Of those who cared about healthy eating, 71% perceived that their friends also cared about

healthy eating. Of those who did not care about healthy eating, 63% perceived that their friends also did not care about healthy eating.

Psychological well-being—Self-esteem was measured with six items from the Rosenberg (1965) Self-Esteem Scale using a 4-point Likert scale. A validation study with adolescents demonstrated that this shortened version and the full version performed nearly identically (van den Berg & Keery, 2006; van den Berg et al., 2007). Responses were summed to create a scale score, with higher scores indicating greater self-esteem ($\alpha = .83$, $M = 18.5$, $SD = 3.45$, test-retest Pearson $r = .85$). Depression was measured with the six-item Depressive Mood Scale (e.g., “feeling hopeless about the future”) using the response scale $1 = \text{not at all}$, $2 = \text{somewhat}$, and $3 = \text{very much}$ (Kandel & Davies, 1982; Patten et al., 1997). Responses were summed to form a scale score ($\alpha = .83$; $M = 11.1$, $SD = 3.03$, test-retest Pearson $r = .73$). Body satisfaction was assessed with a modified version of the Body Shape Satisfaction Scale (Pingitore, Spring, & Garfield, 1997). Satisfaction with 13 different body characteristics (e.g., face, body shape, waist, weight, height, hips, shoulders) was assessed using a 5-point scale ranging from $1 = \text{completely dissatisfied}$ to $5 = \text{completely satisfied}$. Responses were summed to form a scale score ($\alpha = .93$, $M = 41.2$, $SD = 12.0$, test-retest Pearson $r = .89$).

Eating behaviors—Five eating behaviors were examined. Four behaviors—consumption of fruit, vegetables, snacks, and sugar-sweetened beverages—were measured with the Willett Food Frequency Questionnaire, which assesses usual dietary intake over the past year (Willett et al., 1985; see Feskanich et al., 1993, for reliability and validity information). Items were coded to correspond to servings per day. Participants indicated their usual consumption per day of 26 types of vegetables (excluding potatoes; $M = 2.34$, $SD = 2.03$, range = 0 – 24), 11 types of fruits (excluding fruit juice; $M = 1.21$, $SD = 1.29$, range = 0 – 16.5), 26 types of snack foods (e.g., potato chips, candy; $M = 1.91$, $SD = 1.42$, range = 0 – 14.1), and sugar-sweetened beverages ($M = 0.83$, $SD = 1.25$, range = 0 – 13.5). To assess eating at fast food restaurants, participants indicated how often in the past month they had eaten food from the following restaurant types: traditional burger-and-fries, Mexican, fried chicken, sandwich/sub shop, and pizza place. Response options ranged from *never/rarely* to *one or more times per day*. To produce a summary variable of total monthly fast food servings, responses were rescaled to times per month and combined ($M = 12.8$, $SD = 13.1$, range = 0 – 140, test-retest Spearman r 's for individual restaurant types ranged from .43 to .83).

Body mass index (BMI)—Self-reported heights and weights were converted to BMI units: weight (in kilograms)/height² (in meters). In a subsample of 63 male and 62 female participants, height and weight were measured by research staff and high correlations were found between self-reported and measured BMI in males ($r = .95$) and females ($r = .98$). For analyses examining the interaction of BMI status with variables of interest, participants were classified per the National Heart, Lung, and Blood Institute's guidelines (NHLBI Obesity Task Force, 1998) as overweight if their BMIs were ≥ 25 ($n = 1098$) and as non-overweight if their BMIs were < 25 ($n = 1153$).

Data Analysis

ANCOVAs were run using self-attitude about healthy eating, perception of friends' attitude about healthy eating, and the interaction of self-attitude and perception of friends' attitude as predictors of psychological well-being and eating behaviors. To examine the moderating influences of gender and BMI status, 3-way interactions of self-attitude and perception of friends' attitude with gender and BMI status were also run. Race (white versus non-white), cohort (older versus younger), and where appropriate, gender and BMI status, were entered

as covariates and EAT III propensity weights were applied. Significant interactions were probed using simple effects (Jaccard, 1998). For effect size comparisons of two estimated means, Cohen's d was calculated using the square root of the mean square error from the overall ANCOVA. Eating behavior variables were log transformed because they were positively skewed and leptokurtic. The means reported in simple effects analyses of eating behaviors were converted to the original variable scale.

Results

Correlations among Study Variables

Self-attitude about healthy eating and perception of friends' attitude about healthy eating were modestly, positively correlated with each other, and were both negatively related to BMI and positively related to psychological well-being and healthy eating behaviors (see Table 1). Women were more likely than men to care about healthy eating, perceive that their friends cared about healthy eating, have lower psychological well-being, and report healthier eating behaviors. Higher BMI was related to lower psychological well-being, especially body satisfaction, and less-healthy eating behaviors.

The Relation of Eating Attitudinal Balance to Psychological Well-being

The interaction of self-attitude about healthy eating and perception of friends' attitude about healthy eating was significantly related to depression, self-esteem, and body satisfaction [$F(1,2163) = 6.47, p = .01$; $F(1,2162) = 17.35, p < .001$; $F(1,2168) = 14.32, p < .001$]. Table 2 shows the estimated psychological well-being means as a function of self-attitude and perception of friends' attitude. Simple effects of friends' attitude were evaluated at each level of self-attitude. Of participants who cared about healthy eating, those who perceived that friends did not care about healthy eating, relative to those who perceived that friends cared about healthy eating, had greater depression ($M = 11.4$ versus $M = 10.8, p < .001, d = .21$), lower self-esteem ($M = 18.0$ versus $M = 18.7, p < .001, d = .20$), and lower body satisfaction ($M = 39.5$ versus $M = 41.8, p < .001, d = .21$). Among participants who did not care about healthy eating, those who perceived that friends did not care about healthy eating, relative to those who perceived that friends cared about healthy eating, had greater self-esteem ($M = 18.1$ versus $M = 17.0, p < .01, d = .34$) and greater body satisfaction ($M = 40.0$ versus $M = 36.7, p < .01, d = .30$); no significant differences were observed for depression.

The Relation of Eating Attitudinal Balance to Eating Behaviors

The interaction of self-attitude about healthy eating and perception of friends' attitude about healthy eating was significantly related to consumption of fruit, snacks, and sugar-sweetened beverages [$F(1,1933) = 4.62, p < .01$; $F(1,1933) = 4.93, p < .05$; $F(1,1933) = 18.47, p < .001$], but not vegetables or fast food (F 's < 1). Table 3 shows estimated eating behavior means as a function of self-attitude and perception of friends' attitude. Of participants who cared about healthy eating, those who perceived that friends did not care about healthy eating, relative to those who perceived that friends cared about healthy eating, consumed fewer servings of fruit per day ($M = 0.94$ versus $M = 1.11, p < .001, d = .20$) and more servings of sugar-sweetened beverages per day ($M = 0.75$ versus $M = 0.46, p < .001, d = .40$). In contrast, among participants who did not care about healthy eating, those who perceived that friends also did not care about healthy eating, relative to those who perceived that friends did care about healthy eating, consumed fewer servings of snacks per day ($M = 1.45$ versus $M = 1.76, p < .05, d = .28$).

Moderating Influences of BMI Status and Gender

Although BMI status was a marginal moderator of the association between eating attitudes and psychological variables for only self-esteem [$F(1,2159) = 3.6, p = .06$], the overall data pattern was similar across all three psychological variables such that larger differences in well-being as a function of perception of friends' attitude were observed for overweight participants compared to non-overweight participants among those who did not care about healthy eating (see Table 4). For example, of overweight participants who cared about healthy eating, those who perceived that friends did not care about healthy eating had lower self-esteem ($M = 17.8$) than those who perceived that friends cared about healthy eating ($M = 18.4, p < .01, d = .19$). A similar pattern was observed for non-overweight participants who cared about healthy eating (friends do not care $M = 18.3$ versus friends care $M = 19.0, p < .01, d = .21$). Conversely, of overweight participants who did not care about healthy eating, those who perceived that friends did not care about healthy eating had greater self-esteem ($M = 18.4$) compared to those who perceived that friends cared about healthy eating ($M = 16.4, p < .001, d = .58$). Non-overweight participants who did not care about healthy eating did not vary in self-esteem by perception of friends' attitude (friends do not care $M = 17.9$ versus friends care $M = 17.8$).

BMI status did not interact with self-attitude and perception of friends' attitude to predict any of the eating behaviors, and the estimated pattern of eating behaviors based on self-attitude and perceptions of friends' attitude was quite similar across weight groups.

Although gender was a significant moderator of the association between eating attitudes and psychological variables for only body satisfaction [$F(1,2165) = 4.32, p < .05$], the overall data pattern was similar across all three psychological variables such that larger differences in well-being as a function of perception of friends' attitude were observed for women compared to men (see Table 4). For example, of women who cared about healthy eating, those who perceived that friends did not care about healthy eating had lower body satisfaction ($M = 35.4$) than those who perceived that friends cared about healthy eating ($M = 38.4, p < .001, d = .28$). A similar, but smaller, difference was observed for men who cared about healthy eating (friends do not care $M = 44.2$ versus friends care $M = 45.8, p = .05, d = .14$). Conversely, of women who did not care about healthy eating, those who perceived that friends did not care about healthy eating had greater body satisfaction ($M = 39.4$) as compared to those who perceived that friends cared about healthy eating ($M = 33.2, p < .01, d = .57$). Men who did not care about healthy eating did not significantly vary in body satisfaction by perception of friends' attitude (friends do not care $M = 42.6$ versus friends care $M = 40.9, p = .24, d = .15$).

Gender did not interact with self-attitude and perception of friends' attitude to predict any of the eating behaviors, and the estimated pattern of eating behaviors based on self-attitude and perceptions of friends' attitude was quite similar for men and women.

Discussion

The purpose of this investigation was to apply social psychological theory, namely balance theory (Heider, 1958), to illuminate the relations of personal eating attitudes and perceptions of friends' eating attitudes to psychological well-being and eating behaviors. Specifically we wanted to answer the question: Does it matter psychologically or behaviorally if one perceives consistency or inconsistency with friends about the importance of healthy eating? In agreement with study hypotheses and balance theory, consistent eating attitudes between self and perceptions of friends were related to greater psychological well-being than inconsistent attitudes. Among young adults who cared about healthy eating, also perceiving that one's friends cared was related to lower depression and greater self-esteem and body

satisfaction as compared to perceiving that one's friends did not care. Conversely, among those who did not care about healthy eating, perceiving that one's friends cared about healthy eating was related to lower self-esteem and body satisfaction as compared to perceiving that one's friend did not care about healthy eating. A similar pattern emerged for eating behaviors. Of young adults who cared about healthy eating, perceiving that friends cared about healthy eating was generally related to healthier eating than was perceiving that friends did not care about healthy eating. Among those who did not care about healthy eating, eating behaviors generally did not differ by perception of friends' attitudes with the exception of snack consumption, where those who perceived that friends cared about healthy eating ate more snacks.

As a whole, these findings suggest that perceiving disagreement with close others about healthy eating, regardless of self-attitude, may have a negative impact on one's well-being. According to balance theory, inconsistencies create psychological tension when unresolved. This unresolved tension appears to be manifest in how people think and feel about themselves. Attitudinal imbalance may also affect the quality of one's relationships, which can substantially affect one's psychological and physical well-being (e.g., Cohen, 2004; Kiecolt-Glaser & Newton, 2001). When imbalance is present, conflicts can arise, leading one to doubt one's relationships and/or world views, which could decrease social support both behaviorally (avoid certain people) and cognitively (feel less connected).

Not all kinds of inconsistency appear to function in the same way. In line with Newcomb (1959) and Cacioppo and Petty (1981), the present research found balance processes to be most evident when eating attitudes and behaviors were presumably more personally relevant. As discussed above, eating attitudes and behaviors tend to be more salient for women and people who are overweight (Rozin et al., 2003; Castellanos et al., 2009; Vander Wal & Thelen, 2000). Although the pattern of results was similar across gender and weight status, the relation of inconsistency to well-being was most pronounced for women and overweight people. Furthermore, the association of inconsistency to well-being tended to be greater for women and overweight people who reported not caring versus caring about healthy eating; that is, larger differences across perceptions of friends' attitude were observed for women and overweight people who did not care about healthy eating compared to those who cared about healthy eating. This may reflect that not caring about healthy eating is deviant from a normative perspective and (un)healthy eating has moral implications, similar to smoking or drug use (Rozin, 1999).

Balance theory helps to explain why the influence of friends on eating behavior is not always straightforward. Indeed, it would be reasonable to expect that having friends who do not value healthy eating would relate to one's own health in a negative way—that we would be more likely to eat poorly ourselves—but results from the current study suggest that this is not always the case. In fact, perceiving that friends did not value healthy eating was related to more positive self-views and behaviors for some individuals (i.e., those with consistent attitudes). The influence of friends appears to be dependent on one's own attitudes, and these findings highlight the importance of taking a relational perspective when considering psychological and behavioral phenomena (Reis, Collins, & Berscheid, 2000).

Why might people who do not care about healthy eating be unaffected or have less-healthy eating behaviors if their friends care about healthy eating? One answer may be that as a way to establish psychological balance they bolster the consistency between their eating attitudes and behaviors. Engaging in unhealthy dietary behaviors may be the easiest way to lessen the imbalance (assuming they do not change their attitudes) because the views of individuals who do not care about healthy eating are at odds with most people (at least in the present sample). These individuals may also be responding to unwanted influence attempts and are

attempting to establish their autonomy (Ryan & Deci, 2000). Perhaps they eschew impression management tactics (Bolino & Turnley, 2003) and base their eating behaviors on internal preferences and attitudes with little regard for the behavior and attitudes of others (Snyder, 1987). Other research suggests that certain people may be more or less affected by social norms. In an intervention using normative feedback regarding alcohol use, Neighbors et al. (2006) found that the intervention was more effective in reducing alcohol-related negative consequences for those who were higher versus lower in controlled orientation (Ryan & Deci, 2000).

In light of our findings regarding psychological well-being and eating behaviors, interventions that attempt to surround people who eat poorly with models of healthy eating may want to also incorporate intervention components aiming to modify attitudes in cases where the targets of the intervention do not care about healthy eating. Recent weight loss interventions have demonstrated the potential for utilizing social influence to affect change. For example, Leahey et al. (2012) found positive effects for teammate influence in a weight loss competition. Furthermore, spouses and other family members of people undergoing weight loss treatments have been shown to lose weight and improve their own dietary habits (Golan et al., 2010; Woodard et al., 2011). Although people's underlying attitudes are not known in these studies, it seems likely that the network members' attitudes were positive regarding healthy eating and weight loss.

Strengths, Limitations, and Future Directions

A clear strength of this study is that it investigated balance processes in a large population-based sample. Furthermore, it extended balance theory research by considering the attitudinal and behavioral domain of healthy eating and by investigating the influence of balance processes on both psychological well-being and eating behaviors. This research also helps to clarify the influence of friends on eating behaviors by demonstrating that for people who do not care about healthy eating, the influence of friends on eating behaviors may be negligible or counter-intuitive (i.e., less-healthy behaviors when friends care about healthy eating).

Although hypotheses were supported, many of the observed effects were relatively small. However, the outcomes of interest—psychological well-being and eating behaviors—are a product of many important influences such as genetics, family environment, social relationships, educational and occupational achievements, socioeconomic status, etc. As such, it is not surprising that the hypothesized balance effects are relatively small. However, a small effect can have a powerful impact over time (Rosnow & Rosenthal, 1989), and the effect of eating behaviors on health accumulates over many years. Furthermore, the association of eating-related attitudinal balance to well-being was in the “medium” to “strong” range for certain people (e.g., overweight people who do not care about healthy eating; women who do not care about healthy eating). As such, eating-related attitudinal balance may be clinically relevant for some people. The fact that eating-related attitudinal balance was associated with well-being suggests that one's attitude about healthy eating may reflect attitudes and values that go beyond food, which is an interesting avenue for future research. It should be noted that the attitudinal measures utilized in this study were rather crude, single items. Using more sophisticated measures (i.e., measures with less error) may reveal larger effects. Furthermore, in the present analysis, the definition of health eating was completely subjective to the participant. Future research could benefit from examining more objectively defined eating attitudes (e.g., the importance of meeting guidelines for fruit and vegetable intake or limiting fat intake).

Although we have argued that psychological well-being and eating behaviors are influenced by eating attitudes, it is quite possible, given the cross-sectional nature of our data, that

psychological well-being and eating behaviors influence attitudes. For example, someone who has poor eating habits or is depressed may be more likely to perceive attitudinal inconsistencies with friends. In order to more fully understand these patterns of influence, a clear next step will be to examine these processes over time. Does attitudinal inconsistency predict later eating behaviors and psychological well-being, or do eating behaviors and well-being predict perceptions of inconsistency, or both? Additionally, examining attitudes from the perspective of multiple friends would also be important in establishing the nature of balance effects. In this way, one could examine the extent to which people's perceptions of each other's eating attitudes agree with each person's self-reported attitude. Furthermore, one could examine the extent to which the effects of attitudinal inconsistency depend on each person's perceptions and/or the consistency of those perceptions across friends. Finally, assessing relationship features (e.g., closeness, relationship length) could further shed light on these processes. For example, it may be that balance effects are most pronounced among very close friends.

Work by Neighbors et al. (2006, 2008, 2010a, b) has shown that perceived norms are related to health behaviors and that interventions using normative feedback can lead to healthy change. Their research also suggest that the effects of injunctive norms (perceptions of others' approval of a given behavior) and descriptive norms (perceptions of the actual behavior of others) can be complex (e.g., opposite associations of injunctive and descriptive norms with drinking behavior) and can vary by reference group (e.g., friends versus typical students) and degree of group identification. Future studies on inconsistency could benefit from considering multiple reference groups and both injunctive and descriptive norms. Likewise, research on perceived norms could benefit from considering people's attitudes in conjunction with their normative perceptions.

Other avenues for future research include the processes by which people become aware of eating-related inconsistency and the strategies by which they address it. Research in domains such as political attitudes, risky health behaviors, and deviant behaviors suggests that people perceive more agreement than is actually present in friendship networks and that discussion is not the primary avenue by which they deduce friends' attitudes (Goel, Mason, & Watts, 2010; Prinstein & Wang, 2005). In the domain of eating, people may come to know friends' attitudes by direct observation of eating behavior. This may be especially true for young adult friends who may observe one another in more diverse settings than adolescents or older adults (e.g., roommates). In regard to strategies to address imbalance, Fuglestad (2010) found that endorsement of open discussion, relative to avoiding discussion, was associated with greater relational and personal well-being. It is possible that discussion of eating-related imbalance could mitigate negative effects on well-being. Furthermore, people may effectively address imbalance by compartmentalizing or down-playing the importance of the disagreement.

Conclusion

Balance processes have important implications for understanding the relations of eating attitudes of self and friends to eating behaviors and psychological well-being. Across multiple indicators of psychological well-being, inconsistency, relative to consistency, between self-attitude about healthy eating and perception of friends' attitude about healthy eating was related to lower well-being. A similar pattern emerged for eating behaviors. For people who cared about healthy eating, perceiving that friends also cared was related to healthier eating, whereas for people who did not care about healthy eating, this pattern was attenuated or reversed. These findings illustrate the utility of applying balance theory to understand health-related phenomena and the importance of taking into account self-attitudes when considering social influence.

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Table 1

Correlations among Attitudes about Healthy Eating, Gender, BMI, Psychological Well-being, and Eating Behaviors

Variables	Self-attitude	Friends' Attitude	Gender	BMI	Depression	Self-esteem	Body Satisfaction	Fruit	Vegetables	Snacks	Sweetened Beverages	Fast Food
Self-attitude		.25**	.14**	-.06**	-.03	.08**	.04*	.20**	.13**	.02	-.24**	-.17**
Friends' Attitude			.19**	-.09**	-.06**	.07**	.05*	.14**	.13**	.06**	-.21**	-.11**
Gender				-.03	.17**	-.11**	-.26**	.11**	.09**	.01	-.19**	-.18**
BMI					.14**	-.16**	-.42**	-.10**	-.08**	-.06**	.10**	.10**
Depression						-.58**	-.39**	-.04	.03	.05*	.06*	.05*
Self-Esteem							.49**	.10**	.07**	.02	-.07**	-.05*
Body Satisfaction								.13**	.14**	.06**	-.04	-.07**
Fruit									.53**	.28**	-.07**	-.17**
Vegetables										.28**	-.07**	-.05*
Snacks											.11**	.14**
Sweetened Beverages												.28**
Fast Food												

Note. For self and friends' attitude, 0 = does not care about healthy eating and 1 = does care about healthy eating. For gender, 0 = male and 1 = female.

* $p < .05$,

** $p < .01$

Table 2

Predicted Well-being Means as Functions of Self-attitude about Healthy Eating and Perception of Friends' Attitude about Healthy Eating

Self-attitude	Depression			Self-esteem			Body Satisfaction		
	Friends' Attitude			Friends' Attitude			Friends' Attitude		
	Do not care	Care	Sig.	Do not care	Care	Sig.	Do not care	Care	Sig.
Does not care	11.3	11.6	$p=.31$	18.1	17.0	$p<.01$	40.0	36.7	$p<.01$
Cares	11.4	10.8	$p<.001$	18.0	18.7	$p<.001$	39.5	41.8	$p<.001$

Note. Means estimated controlling for BMI status (overweight versus not), gender, race (white versus non-white), and cohort (older versus younger). Using simple effects analysis, p -values correspond to mean comparisons of perception of friends' attitude within each level of self-attitude.

Table 3

Predicted Eating Behavior Means as Functions of Self-attitude about Healthy Eating and Perception of Friends' Attitude about Healthy Eating

Self-attitude	Fruit Servings Per Day			Vegetable Servings Per Day			Sugar-sweetened Beverages Per Day			Snack Servings Per Day			Fast Food Per Month		
	Do Not Care	Care	Sig.	Do Not Care	Care	Sig.	Do Not Care	Care	Sig.	Do Not Care	Care	Sig.	Do Not Care	Care	Sig.
Does Not Care	0.67	0.60	$p=.55$	1.33	1.51	$p=.25$	0.96	1.14	$p=.16$	1.45	1.76	$p<.05$	17.8	15.5	$p=.14$
Cares	0.94	1.11	$p<.001$	1.82	2.10	$p<.001$	0.75	0.46	$p<.001$	1.65	1.62	$p=.32$	12.9	12.0	$p=.07$

Note. Means estimated controlling for BMI status (overweight versus not), gender, race (white versus non-white), and cohort (older versus younger). Using simple effects analysis, p -values correspond to mean comparisons of perception of friends' attitude within each level of self-attitude.

Table 4
Predicted Well-being Means as Functions of Self-attitude about Healthy Eating and Perception of Friends' Attitude about Healthy Eating by Weight Status and Gender

Participants	Self-attitude	Depression				Self-esteem				Body Satisfaction			
		Friends' Attitude				Friends' Attitude				Friends' Attitude			
		Do not care	Care	Sig.		Do not care	Care	Sig.		Do not care	Care	Sig.	
Non-Overweight	Does not care	11.1	11.1	$p=.75$		17.9	17.8	$p=.90$		43.2	41.0	$p=.50$	
	Cares	11.0	10.5	$p<.05$		18.3	19.0	$p<.01$		43.8	46.5	$p<.01$	
Overweight	Does not care	11.4	12.0	$p=.18$		18.4	16.4	$p<.001$		37.3	32.7	$p<.01$	
	Cares	11.8	11.1	$p=.001$		17.8	18.4	$p<.01$		35.5	37.4	$p<.01$	
Men	Does not care	10.7	10.8	$p=.89$		18.4	17.5	$p=.10$		42.6	40.9	$p=.24$	
	Cares	10.7	10.2	$p=.01$		18.8	19.2	$p=.08$		44.2	45.8	$p=.05$	
Women	Does not care	11.6	12.5	$p=.14$		18.3	16.5	$p=.01$		39.4	33.2	$p<.01$	
	Cares	12.1	11.4	$p=.001$		17.4	18.3	$p<.001$		35.4	38.4	$p<.001$	

Note. Where appropriate, means estimated controlling for BMI status (overweight versus not), gender, race (white versus non-white), and cohort (older versus younger). Using simple effects analysis, p -values correspond to mean comparisons of perception of friends' attitude within each level of self-attitude.