Obesity, Labeling, and Psychological Distress in Black and White Girls: The Distal Effects of Stigma

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Abstract

The stigma of childhood obesity has the potential to affect psychological development during the early life course, but few studies examine whether experiencing stigma in childhood and adolescence has lasting ramifications for mental health during the transition to adulthood. Integrating modified labeling theory with a life course perspective, this study examined how obesity at different ages affects psychological distress in late adolescence using longitudinal data on black and white girls. We tested whether parent or friend labeling mediates the relationship and whether long-term effects on psychological distress are through earlier distress. Findings showed that there were significant short-term and long-term effects of obesity on psychological distress through both parent and friend labeling among white girls and that long-term effects on psychological distress were also mediated by earlier psychological distress. Among black girls, there were no long-term effects, suggesting weight based stigma is more consequential for white girls compared to black girls.

Keywords

labeling, obesity, psychological distress, stigma

Childhood obesity is a multifaceted problem in the United States. Not only is there an increased likelihood obese children will become obese adults, there is also the potential for childhood obesity to affect psychological development as children age into adulthood. Obesity is a stigmatized condition, a "deeply discrediting" characteristic or attribute that can result in individuals being devalued by others and ultimately lead individuals to devalue themselves (Goffman 1963; Jones et al. 1984). While research links the experience of stigma with some psychological difficulties in childhood and adolescence, few studies examine whether experiencing stigma has lasting ramifications for mental health over the early life course. The negative stereotypes associated with obesity are ubiquitous in contemporary U.S. culture and hence becoming obese can cause an internal reaction of shame and self–loathing and can result in rejection, prejudice, and discrimination (Erdman-Farrel 2011; Latner and Stukard 2003; Puhl and Heuer 2009). Given that late childhood and early to mid adolescence are periods of identity formation and rapid change, how does weight based stigma influence children's psychological wellbeing over the course of adolescence?

Sociological theories of stigma emphasize that individuals possessing stigmatized characteristics internalize the associated devalued label and suffer negative emotions (Phelan, Link, and Dovidio 2008). Modified labeling theory (MLT) extends stigma theory in that it implies that stigmatized characteristics are internalized to such an extent that their effects may outlive the discredited attribute itself (c.f., Link and Phelan 2001). Life course theory emphasizes that there may be particularly vulnerable periods in childhood or adolescence during which experiencing negative events has a greater effect on long term outcomes. In order to investigate these possible relationships using data on black and white girls, this study examines how experiencing weight based stigma at different ages during late childhood, early, and mid–adolescence affects subsequent psychological distress in late adolescence. To isolate causal order, we use longitudinal data with psychological distress and BMI measured at multiple time points and a

model that can disentangle whether obesity increases the risk of distress, whether distress increases the risk of obesity or both and whether they do so through current or future conditions.

OBESITY AND PSYCHOLOGICAL DISTRESS

Over the past thirty years, obesity prevalence doubled for children aged six to eleven and tripled for ages twelve to nineteen (Baskin et al. 2005). Recent figures indicate that approximately 32 percent of children between the ages of two and nineteen fall above the 85th percentile and 16 percent at or above the 95th percentile on the 2000 Centers for Disease Control (CDC) Body Mass Index (BMI) charts, rendering them overweight or obese, respectively (Ogden et al. 2010).

Obese youth in the U.S. experience weight based stigma, with youth reporting stereotyping, bias, and discrimination from peers, educators, and parents; though this weight based stigma is not experienced uniformly across gender and racial groups (Crandall 1995; Davison and Birch 2004; Puhl and Heuer 2009; Puhl and Latner 2007). Peer groups tease, bully, and socially exclude children who are obese, just as some parents criticize their children for weighing too much or eating too much (Davison and Birch 2002; Pierce and Wardle 1997). Race and gender are key characteristics that influence the relationship between weight based stigma and mental health outcomes.

In general, women are subject to more appearance related pressure and weight related pressure in particular (Hebl, King, and Perkins 2009). The majority of studies linking adolescent obesity to emotional harm, whether long term or confined to adolescence, indicates that the process is more robust for girls than boys (Al-Mamun et al. 2007; Merten, Wickrama, and Williams 2008; see Mustillo et al. 2003 for an exception). Because prior research supports the link between obesity and mental health to be more robust for women compared to men, we confine this study to females only.

Racial groups vary in their evaluation and responses to different body types, such as being overweight or obese. Black women in particular appear to be more accepting than white women of a

range of body types and in their evaluations of obese people (Hebl and Heatherton 1998; Lovejoy 2001). Black women are also less likely to experience adverse mental health outcomes due to their weight (Averett and Korenman 1999). Thus, we might expect the relationship between obesity and mental health to be stronger for white girls than for black girls. Several studies examining racial differences in the long term effects of obesity on mental health found that obesity during childhood and adolescence continues to influence mental health later in life, more so for white females than black females (BeLue, Francis, and Colaco 2009; Boutelle et al. 2010; Sanchez et al. 2009). As such, we examine black and white differences in this study.

Hypothesis 1 (race hypothesis): The relationship between obesity and distal psychological distress will be stronger for white girls compared to black girls.

MODIFIED LABELING THEORY

As to how weight based stigma produces these adverse outcomes, we turn to MLT. Labeling theory, the precursor to MLT, posits that stereotypes are learned during early socialization and reinforced over time (Scheff 1966). These stereotypes become internalized and persist throughout the socialization process. According to labeling theory, once obese individuals are labeled as "fat" or "obese," they can experience changed self perceptions, because the internalization of the negative attributes associated with obesity has the potential to negatively alter their identity. MLT further emphasizes how stigmatized individuals internalize devaluating societal messages, but it diverges from Scheff's approach in that the social reactions themselves are not the defining factors that have the potential to initiate change in an individual's identity. A key component to MLT is the internalized *expectation* of rejection and discrimination specifically in enduring conditions, such as mental health diagnoses (Link 1987; Link et al. 1989). According to MLT, the prejudices of other people may be solely anticipated by the individual

with the stigmatizing condition for identity to be susceptible to negative outcomes. No direct action by others is necessary to produce harm (Link et al. 1989; Link and Phelan 2001).

Following MLT, we would expect that early obesity is linked to proximal mental health issues through labeling and that labeling creates lasting identity changes that lead to distal mental health issues, regardless of continued weight problems. Indeed, one recent study found that self concept among formerly obese white adolescent girls was the same as when they were obese, suggesting a lingering effect of stigma (Mustillo, Hendrix, and Schafer 2012).

Hypothesis 2 (labeling hypothesis): Earlier obesity will be associated with distal psychological distress, but the effects will be mediated by labeling from parents and friends.

Hypothesis 3 (double mediation hypothesis): The effect of earlier obesity on distal psychological distress will further be mediated by proximal psychological distress (e.g., obesity will lead to labeling, which will then lead to proximal psychological distress and proximal psychological distress will be associated with distal psychological distress).

Integrating MLT and a Life Course Perspective

When people are labeled with a stigmatizing condition, and if the label becomes integrated into their identity, individuals may suffer from poorer mental health (Wardle and Cooke 2005). The labeling component of the stigma process provides the context for explaining why and how stigma affects mental health, but it is unlikely that experiencing stigma has uniform effects throughout the life course. Considering the changes in self and identity that take place during childhood, adolescence, and young adulthood, it is highly probable that the impact of the stigma experience, brought on by obesity itself but activated by labeling, varies over the early life course.

Developmental scholars identify adolescence as a period where individuals begin to explore ideas related to their self concept and develop a greater understanding of the roles they fulfill in society (Steinberg and Morris 2001). This period is also marked by structural changes in which an adolescents' social world transitions from being very narrow in scope to broad, specifically with the move from primary to secondary school (Eccles 1999; Gecas and Mortimer 1987). During these structural shifts, social relationships with peers take a more prominent role than relationships with parents, especially over the short term (Blos 1979; Wang, Peterson, and Morphey 2007). Peer groups replace parents by providing support as well as a self reference point during early to mid–adolescence (Kroger 2007; Marcia 1983). Peers remain salient through mid–adolescence, but dissipate in late adolescence as adolescents seek to establish their own individuality (Brown, Clasen, and Eicher 1986; Kroger 1996, 2007).

Hypothesis 4 (differential labeling hypothesis): Labeling from friends during early adolescence will have a stronger impact on distal psychological distress than labeling from parents.

Along with these structural changes, children and teens are also undergoing formative changes to synthesize their identities (Erikson 1968). During the transition from late childhood to early adolescence, children begin to conceptualize themselves abstractly such that identity becomes better organized, personal beliefs increase in salience, and self evaluation becomes more critical (Harter 1998; Piaget 1960). Whereas during early childhood, self evaluations are more positive in nature, during early adolescence they take more of a negative, critical, and self doubting role (Demo 1992). Thus, adverse experiences may be exacerbated through self evaluation during this time period. Developmental theories indicate that early adolescence is a critical time for identity formation and group acceptance.

Hypothesis 5 (developmental hypothesis): The effects of early labeling on distal psychological distress will be stronger when the labeling occurs during early adolescence compared to late childhood or mid–adolescence.

Putting all of this together, in this study we integrate a life course perspective with MLT to examine whether experiencing obesity and labeling at different ages during late childhood, early and mid–adolescence has distal effects on psychological distress among girls. We test whether any distal effects on psychological distress are through continued obesity or continued distress. We also test whether labeling mediates the relationship between obesity and early and later distress and whether the source of the labeling matters (e.g., parent labeling versus friend labeling). Finally, we explore racial differences in these relationships.

METHODS

Sample

The data for this study come from the National Heart, Lung, and Blood Institute's (NHLBI) Growth and Health Study (GHS). GHS was a longitudinal, multisite study of 2,379 females who were aged 9 or 10 at baseline and assessed annually for approximately 10 years starting in 1987. Subjects were between 18 and 21 in the final wave of data collection. Sites included Berkeley, California; Cincinnati, Ohio; and Washington D.C. Participants were primarily recruited through local public and parochial schools and a health maintenance organization. The study included females whose parents reported them as either black or white and within 2 weeks of their 9^{th} or 10^{th} birthday. Parental and child consent was obtained and data were collected either at the local site or in the child's home. Extensive details of the data collection effort can be found elsewhere (NHLBI GHS Research Group 1992). Attrition over the ten

year study period was extremely low, with approximately 89 percent of the baseline respondents participating in the final year of the study.

Measures

Obesity. The Quetelet Index (kg/m2) was assessed at each wave with each respondent wearing either a paper hospital gown or a t–shirt and socks. To compute obesity from BMI, we use the CDC BMI–for–age 95th percentile cut points as reference values, per CDC guidelines. At baseline (age 9-10), approximately 8 percent of white subjects and 17 percent of black subjects were obese (see Table 1). By age 17-19, 11 percent of white subjects and 24 percent of black subjects were obese.

Labeling. When subjects were ages 9-10, 11-12, and 13-14, they were asked a series of questions about whether people in their lives told them they were too fat. Specifically, they were asked whether their mother, father, best female friend, best male friend, any female friend, or any male friend told them they were too fat. We combined subjects' responses on the mother and father items to create a parent item and we further combined their responses on the various friend items to create one friend item. Within racial groups, more girls reported being told they were too fat than were actually obese. At age 9-10, among white girls 16 percent of subjects reported parent labeling and 21 percent reported friend labeling while 30 percent of black subjects reported parent labeling and 28 percent reported friend labeling. These percentages stayed relatively stable for white girls, but decreased somewhat over time for black girls. By age 13-14, 15 percent of white girls and 24 percent of black girls reported parent labeling while 19 percent of white girls and 22 percent of black girls reported friend labeling.

Psychological Distress. The Center for Epidemiological Studies Depression Scale (CES–D) was administered in wave 9 when subjects were between 18 and 21 years old (Radloff 1977). The CES–D is a well validated scale demonstrated to be reliable for assessing depressive symptomology across age groups, racial/ethnic groups and both genders (Knight et al. 1997; Radloff 1977; Roberts, Vernon, and

Rhoades 1989). The scale contains 20 questions that assess how often during the previous week subjects experienced depressive symptoms, such as not being able to shake the blues, feeling depressed, feeling too tired to do things, feeling sad, and so forth (Radloff 1977). The items are scored on a 0 to 3 scale and added together for a range between 0 and 60; a higher score indicates a higher level of depression symptomology. At age 18-21, the mean CES–D score was 12.99 for white girls and 13.75 for black girls. Both of these mean scores are below the 16 point threshold for depression.

At earlier waves, we use the Perceived Stress Scale (PSS) to measure distress. The PSS was designed to assess the degree to which situations in one's life are perceived as stressful (Cohen, Kamarck, and Mermelstein 1983), but was found to have a significant amount of overlap with the CES–D. The mean PSS score was between 24 and 25 for black and white girls at each wave.

Controls. We included baseline controls for parent education and household income as well as a control for age at menarche. Race was defined by subject's self identification and parent's concordant determination. Forty nine percent of the sample identified as white/Caucasian and 51 percent as black/African American.

Analytic Models

To test our hypotheses, we estimated a particular type of regression model that can estimate both proximal and distal mediation with multiple mediators while controlling for autoregressive and cross lagged effects (MacKinnon 2008). The proximal part allows us to test for the short term mental health consequences of obesity and labeling. That is, we examine the effects of obesity and labeling at each age on mental health one year later. The distal part allows us to test for the longer term mental health outcome during late adolescence. That is, we examine the effects of obesity and labeling at each age on psychological distress at ages 18–21. The cross lagged part facilitates testing whether mental health at

one wave predicts obesity at the next wave, in addition to testing whether obesity at one wave is associated with mental health at the next wave. Finally, the autoregressive piece controls for effects of earlier state on later state, such as controlling for obesity at one wave on obesity at the next wave or the effects of mental health at one wave on mental health at the next wave.

RESULTS

White Girls

Figure 1a presents the significant direct and indirect paths for white girls between obesity at age 9-10 and psychological distress at age 18-21. Starting with the autoregressive paths, both obesity and mental health issues persisted through time; that is obesity at each wave was significantly associated with obesity at the next wave and psychological distress at each wave was significantly associated with psychological distress at the next wave. For example obesity at age 9-10 was associated with a 2.62 increase in the propensity of obesity at age 11-12 and a one point increase in mental health symptoms at ages 10-11 was associated with a .45 unit increase in mental health symptoms at age 12-13. Parent labeling and friend labeling did not persist across time in general.

Turning to the direct and indirect effects of obesity on psychological distress, obesity at age 9-10 was associated with an increased likelihood of parent labeling which was then associated with a 3.14 point increase in psychological distress at ages 10-11 with a significant indirect effect of obesity 9-10 on psychological distress 10-11. Obesity at age 9-10 was also associated with an increased likelihood of friend labeling at 9-10. The direct effect from friend labeling 9-10 to psychological distress 10-11 was not significant, but the indirect effect from obesity 9-10 to psychological distress through friend labeling was significant. Lastly, there was a significant effect of psychological distress at age 10-11 on obesity at

age 11-12, such that a one unit increase in distress was associated with a .02 increase in the propensity of obesity.

Obesity 11-12 was associated with an increased likelihood of parent labeling and parent labeling was associated with an increase in psychological distress at age 12-13with a significant indirect effect. Obesity 11-12 was also associated with an increase in friend labeling and subsequent increase in psychological distress at 12-13. There was a significant indirect effect through friend labeling for white girls. Psychological distress at 12-13 was associated with an increased propensity of obesity at age 13-14.

Shifting right again in Figure 1a, obesity at age 13-14 was associated with an increased likelihood of parent labeling and parent labeling was associated with a 3.51 point increase in psychological distress at 14-15, with a significant indirect effect. Obesity also was associated with an increase in friend labeling and friend labeling was associated with a 2.49 increase in distress score. The indirect effect from obesity to distress through friend labeling was significant. Additionally, distress at age 14-15 was associated with a .04 increased propensity for obesity at age 18-21. In sum, obesity in late childhood, early adolescence, and mid–adolescence predicted an elevation in proximal mental health symptoms through parent labeling and friend labeling.

As to the distal effects of earlier obesity and labeling, there were significant effects of obesity at age 11-12 and age 13-14 on psychological distress in late adolescence (age 18-21). The effect of obesity at age 11-12 was mediated by parent labeling at 11-12 and psychological distress at 12-13, while the effect of obesity at 13-14 was mediated through parent labeling 13-14 and psychological distress 14-15 and friend labeling 13-14 and psychological distress 14-15. In sum, obesity at 11-12 and 13-14 predicted psychological distress at 18-21 either through parent labeling and earlier distress alone or through parent

labeling/earlier distress and friend labeling/earlier distress. Hence the effects of earlier obesity and labeling on later distress were entirely through the effects on proximal mental health.

Black Girls

Starting with the autoregressive paths, the effects of both obesity and psychological distress persisted across time. For example, being obese at age 9-10 was associated with a 2.51 increase in the propensity of being obese at age 11-12 and a one symptom increase in distress at age 10-11 was associated with a.32 symptom increase in mental health issues at age 12-13. The effects of parent labeling and friend labeling were generally associated across time. For example, parent labeling at age 9-10 was associated with an increased likelihood in parent labeling at 11-12 and friend labeling at 9-10 was associated with an increased likelihood of friend labeling at 11-12. Friend labeling at 11-12 was also associated with an increase in the likelihood of friend labeling at 13-14. Turning to the short term effects of obesity on mental health symptoms, there were no effects either direct or indirect of obesity 9-10 on mental health 11-12 through parent labeling or friend labeling, though there were significant direct effects of obesity 9-10 on parent and friend labeling. There was no direct effect of obesity on psychological distress, and no effect of psychological distress 10-11 on obesity at 11-12.

Moving across Figure 1b, there was a direct effect of obesity at age 11-12 on parent labeling among black girls, a direct effect of parent labeling on psychological distress at 12-13, and an indirect effect of obesity on distress through parent labeling . Additionally, being obese at 11-12 was significantly associated with friend labeling at 11-12 and friend labeling was associated with a 7.79 point increase in psychological distress at 12-13 with a significant indirect effect. A one unit increase in distress symptoms at age 12-13 was associated with a .38 increase in the propensity of obesity at 13-14.

As for the next stage of the model, obesity at age 13-14 was significantly associated with a .02 increase in the propensity to be labeled fat by a parent and by a friend and friend labeling was then

significantly associated with a 4.63 point increase in psychological distress at age 14/15. There was no significant indirect effect, but there was a significant direct effect of obesity 13-14 on psychological distress at age 14-15.

For the distal effects on psychological distress among black girls, there were no significant effects of obesity at any earlier age on psychological distress in late adolescence either directly, through parent or friend labeling, or through earlier distress.

DISCUSSION

This study investigated how experiencing weight based stigma at different ages affects both short term and later mental health in youth. MLT, combined with a life course perspective, provided a lens to model and interpret the interplay between obesity, weight based stigma, and psychological distress as children transitioned from late childhood at ages 9 and 10 to late adolescence at ages 18 to 21. By examining both short term and more distal effects, we can better isolate the critical periods in which weight based stigma, through the process of labeling by parents and peers, has an effect on youth and their depressive symptomology over the early life course.

The findings show that the relationship between obesity and mental health varied for white and black girls, varied by age, and varied in distal effects. For white girls, there were significant proximal and distal effects of obesity on psychological distress. The proximal effects were mediated by both parent labeling and friend labeling at every age and there were no significant differences in the sizes of the parent and friend indirect effects. There were also significant effects of obesity on distal psychological distress through parent labeling and proximal distress at ages 11-12 and both parent and friend labeling and proximal distress at 13-14. For black girls, we found only short term effects of obesity on distress through parent and friend labeling and only at ages 11 and 12. For black girls, there were no long term effects.

Based on developmental literature, we hypothesized that the effects of labeling on distal distress would be strongest in early adolescence and the negative effect of parent labeling on distal psychological distress was larger in early adolescence compared to late childhood, but equally as large in mid–adolescence for white girls. In terms of the differential hypothesis, among white girls parent and friend labeling had about the same impact on proximal distress but only parent labeling at ages 11 and 12 affected distal distress through proximal distress. At ages 13 and 14, both parent and friend labeling had an impact on distal distress through proximal distress. Thus, parent labeling mattered more in early adolescence and parent and friend labeling had about the same impact in mid–adolescence. Because both were mediated through labeling and proximal distress, the double mediation hypothesis was supported as well. In sum, we found support for the race, labeling and double mediation hypotheses, and partial support for the differential labeling and the developmental hypotheses.

This research contributes to the growing body of literature that brings attention to the implications of early life events that continue to shape youth identity formation as they age and transition into adulthood. Based on our analysis, we identified early and mid–adolescence (ages 11–14 in our analyses) as a critical time developmentally where the impact of weight related stigma is more salient for white girls. The same ages appeared to be a vulnerable time for black girls in the short term as well, as these were the ages in which there was an effect of obesity on proximal mental health among black girls. An explanation for this may be that self-evaluation becomes more critical, and internalized, as youth transition into adolescence (Harter 1998; Piaget 1960).

Parent and peer labeling seem to have about the same effects on the relationship between obesity and mental health for white girls. The effects of parent labeling and friend labeling endured from late childhood to late adolescence, though the effects were strongest at ages 9/10. This finding diverges with studies that show a transition from the influence of parents to friends on sense of self in late childhood

and early adolescence (Hay and Ashman 2003). Perhaps there is something so fundamental about body and identity that the value judgments and labeling behaviors of parents and friends are equally distressing for early adolescents. Another potential explanation involves salience of the relationship. It is possible that parent labeling may continue to have a strong impact if girls have as close or closer a relationship to their parents as to the friends doing the labeling. Future research should consider the closeness of the person doing the labeling to the stigmatized individual.

Adding to the research on race and obesity, weight based stigma is more consequential for white girls compared to black girls, which reinforces findings that show a stronger impact among white girls compared to black girls. A variety of studies indicate differential weight stigma experiences for black and white adolescents, where black adolescents are not as affected by the Western thin ideal (Smolak 2004). One possible explanation, as Hesse-Biber et al. (2004:51) infer, is that "…African American female identity is tightly tied to their sense of racial identity.

These results have the potential to contribute to both the life course perspective and stigma theory. The results suggest that the timing of stigma has implications for youth over the life course and that the influence of stigma on one's life changes with age. Here, those who were labeled during late childhood experienced the greatest proximal effects and those who were labeled during early and mid–adolescence experienced the greatest distal effects. In addition, not all individuals were influenced by stigma in the same way over the life course, as evidenced by the comparison between white and black girls. The fact that early obesity continued to have effects on later mental health through labeling and earlier mental health also contributes to the literature demonstrating the lasting impact of early life experiences.

Although these results support the study hypotheses either completely or partially and extend both the life course perspective and MLT, we did not have a direct measure of the internalization of

stigma. MLT suggests that the mechanism linking labeling to psychological distress is the internalization of the negative attitudes and stereotypes about the stigmatized characteristic. We were unable to model the internalization process due to lack of appropriate measures and thus we infer this link rather than test it directly. Future research could contribute to MLT by testing this link directly. Second, the use of single item measures for labeling could have failed to capture other verbal and nonverbal cues from family and friends. Thus, we were only able to capture one type of labeling, which could underestimate the impact of labeling on distress.

Despite these limitations, these findings extend both MLT and the life course perspective by considering specific critical periods of vulnerability within an individual's developmental trajectory as well as demonstrating the long term psychological consequences of earlier life obesity and labeling. Several practical implications are evident. While there are currently some successful interventions at work across the country, most focus on diet, exercise, and physical health. Adding a mental health component that focused on self, identity, and combatting depression could help prevent long term mental health difficulties. Results from the current study suggest that interventions could focus particularly on the period early to mid–adolescence while considering various cultural contexts surrounding what it means to be overweight and obese. Finally, as more attention is turned to our nation's obesity epidemic, we expect that a greater understanding of both the practical and social contexts surrounding weight and identity will be an important contribution to managing and assisting youths through this early life experience.

ACKNOWLEDGMENTS

The authors would like to thank the three anonymous reviewers for their helpful comments and feedback on this manuscript.

REFERENCES

Al-Mamun, Abdullah, Susanna Cramb, Brett McDermott, Michael O'Callaghan, Jake M. Najman, and Gail M. Williams. 2007. "Adolescents' Perceived Weight Associated with Depression in Young Adulthood: A Longitudinal Study." *Obesity* 15: 3097–3105.

Anderson, Sarah E., Patricia Cohen, Elena Naumova, Paul F. Jacques, and Aviva Must. 2007. "Adolescent Obesity and Risk for Subsequent Major Depressive Disorder and Anxiety Disorder: Prospective Evidence." *Psychosomatic Medicine* 69: 740–47.

Anderson, Sarah E., Elena Naumova, and Aviva Must. 2006. "Association of Depression and Anxiety Disorders with Weight Change in a Prospective Community-Based Study of Children Followed Up into Adulthood." *Archives of Pediatrics & Adolescent Medicine* 160:285–91.

Averett, Susan and Sanders Korenman. 1999. "Black-White Differences in Social and Economic Consequences of Obesity." *International Journal of Obesity* 23: 166–73.

Baskin, Monica L., Jamy D Ard, Frank A. Franklin, and David B. Allison. 2005. "Prevalence of Obesity in the United States." *Obesity Reviews* 6:5–7.

BeLue, Rhonda, Lori Ann Francis, and Brendon Colaco. 2009. "Mental Health Problems and Overweight in a Nationally Representative Sample of Adolescents:Effects of Race and Ethnicity." *Pediatrics* 123:697–702.

Bentler, Peter M. 1990. "Comparative Fit Indexes in Structural Models." *Psychological Bulletin* 107:238–46.

Blos, Peter. 1979. *The Adolescent Passage: Developmental Issues* New York: International Universities Press.

Boutelle, Kerri N., Peter Hannan, Jayne A. Fulkerson, Scott J. Crow, and Eric Stice. 2010. "Obesity as a Prospective Predictor of Depression in Adolescent Females." *Health Psychology* 29:293–98.

Brown, B. Bradford, Donna R. Clasen, and Sue Ann Eicher. 1986. "Perceptions of Peer Pressure, Peer Conformity Dispositions, and Self-Reported Behavior Among Adolescents." *Developmental Psychology* 22:521–30.

Browne, Michael W. and Robert Cudeck. 1993. *Alternative Ways of Assessing Model Fit*, Edited by K. A. Bollen and J. S. Long. Newbury Park, CA: Sage Focus Editions.

Brylinsky, Jody A. and James C. Moore. 1994. "The Identification of Body Build Stereotypes in Young Children." *Journal of Research in Personality* 28:170–81.

Cohen, Sheldon, Tom Kamarck, and Robin Mermelstein. 1983. "A Global Measure of Perceived Stress." *Journal of Health and Social Behavior* 24:385–96.

Cramer, Phebe and Tiffany Steinwert. 1998. "Thin is Good, Fat is Bad: How Early Does it Begin?" *Journal of Applied Developmental Psychology* 19:429–51.

Crandall, Christian S. 1995. "Do Parents Discriminate Against their Heavyweight Daughters?" *Personality and Social Psychology Bulletin* 21:724–35.

Davison, Kirsten Krahnstoever and Leann Lipps Birch. 2002. "Obesigenic Families: Parents' Physical Activity and Dietary Intake Patterns Predict Girls' Risk of Overweight." *International Journal of Obesity Related Metabolic Disorders* 29:1186–93.

Davison, Kirsten Krahnstoever and Leann Lipps Birch. 2004. "Predictors of Fat Stereotypes among 9-Year-Old Girls and Their Parents." *Obesity Research* 12:86–94.

Demo, David H. 1992. "The Self-Concept Over Time: Research Issues and Directions." *Annual Review of Sociology* 18:303–26.

Eccles, Jacquelynne S. 1999. "The Development of Children Ages 6 to 14." *The Future of Children* 9:30–44.

Elder Jr., Glen H. 1998. "The Life Course as Developmental Theory." *Child Development* 69:1–12.

Erdman-Farrell, Amy. 2011. *Fat Shame: Stigma and the Fat Body in American Culture*. New York: New York University Press.

Erikson, Erik H. 1968. *Identity: Youth and Crisis*. New York: Norton.

Garson, G. David. 2011. "Statnotes: Topics in Multivariate Analysis." http://faculty.chass.ncsu.edu/garson/pa765/statnote.htm. Accessed June 2, 2012.

Gecas, Viktor and Jeylan T. Mortimer. 1987. "Stability and Change in the Self-Concept from Adolescence to Adulthood." Pp. 365–404 in *Self and Identity: Individual Change and Development*, edited by T. M. Honess and Y. K.M. New York: Routledge and Kegan Paul.

Goffman, Erving. 1963. *Stigma: Notes on the Management of Spoiled Identity*. New York, NY: Touchstone.

Goodman, Elizabeth and Robert C. Whitaker. 2002. "A Prospective Study of the Role of Depression in the Development and Persistence of Adolescent Obesity." *Pediatrics* 110:497–504.

Green, Jennifer Greif, Katie A. McLaughlin, Patricia A. Berglund, Michael J. Gruber, Nancy A. Sampson, Alan M. Zaslavsky, and Ronald C. Kessler. 2010. "Childhood Adversities and Adult Psychiatric Disorders in the National Comorbidity Survey Replication I: Associations with First Onset of DSM-IV Disorders." *Archives of General Psychiatry* 67:113–23.

Harter, Susan. 1998. "The Development of Self-Representations." Pp. 553–617 in *Handbook of Child Psychology*, vol. 3 Social Emotional and Personality Development, edited by W. Damon and N. Eisenberg. Hoboken, NJ: Wiley.

Hay, Ian and Adrian F. Ashman. 2003. "The Development of Adolescents' Emotional Stability and General Self-Concept: The Interplay of Parents, Peers and Gender." *International Journal of Disability, Development and Education* 50:77–91.

Hebl, Michelle R. and Todd F. Heatherton. 1998. "The Stigma of Obesity in Women: The Difference is Black and White." *Personality and Social Psychology Bulletin* 24:417–26.

Hebl, Michelle R., Eden B. King, and Andrew Perkins. 2009. "Ethnic Differences in the Stigma of Obesity: Identification and Engagement with a Thin Ideal." *Journal of Experimental Social Psychology* 45:1165–72.

Hesse-Biber, Sharlene Nagy, Stephanie A. Howling, Patricia Leavy, and Meg Lovejoy. 2004. "Racial Identity and the Development of Body Image Issues among African American Adolescent Girls." *The Qualitative Report* 9(1):49–79.

Jones, Eduard E., Amerigo Farina, Albert H. Hastorf, Hazel Markus, Dale T. Miller, and Robert A. Scott. 1984. *Stimga: The Psychology of Marked Relationships*. New York: W.H. Freeman & Co Ltd.

Kaplow, Julie B. and Cathy Spatz Widom. 2007. "Age of Onset of Child Maltreatment Predicts Long-Term Mental Health Outcomes." *Journal of Abnormal Psychology* 116:176–87.

Keiley, Margaret, Tasha R. Howe, Kenneth A. Dodge, John E. Bates, and Gregory S. Pettit. 2001. "The Timing of Child Physical Maltreatment: A Cross-Domain Growth Analysis of Impact on Adolescent Externalizing and Internalizing Problems." *Development and Psychopathology* 13:891–912.

Knight, Robert G., Sheila Williams, Rob McGee, and Susan Olaman. 1997. "Psychometric Properties of the Centre for Epidemiologic Studies Depression Scale (CES-D) in a Sample of Women in Middle Life." *Behaviour Research and Therapy* 35:373–80.

Kraig, Katherine Anne and Pamela K. Keel. 2001. "Weight-based Stigmatization in Children." *International Journal of Obesity* 25:1661–66.

Kroger, Jane. 1996. "Identity, Regression, and Development." *Journal of Adolescence* 19:203–22.

Kroger, Jane. 2007. *Identity Development: Adolescence through Adulthood*. Thousand Oaks, CA: Sage .

Latner, Janet D. and Albert J. Stunkard. 2003. "Getting Worse: The Stigmatization of Obese Children." *Obesity Research* 11:452–56.

Link, Bruce G. 1987. "Understanding Labeling Effects in the Area of Mental Disorders: An Assessment of the Effects of Expectations of Rejection." *American Sociological Review* 52:96–112.

Link, Bruce G., Francis T. Cullen, Elmer Struening, Patrick E. Shrout, and Bruce P. Dohrenwend. 1989. "A Modified Labeling Theory Approach to Mental Disorders: An Empirical Assessment." *American Sociological Review* 54:400–23.

Link, Bruce G. and Jo C. Phelan. 2001. "Conceptualizing Stigma." *Annual Review of Sociology* 27:363–85.

Lovejoy, Meg. 2001. "Disturbances in the Social Body: Differences in Body Image and Eating Problems among African American and White Women." *Gender and Society* 15:239–61.

MacKinnon, David P. 2008. *Introduction to Statistical Mediation Analysis*. New York: Taylor & Francis Group, LLC.

Marcia, James E. 1983. "Some Directions for the Investigation of Ego Development in Early Adolescence." *The Journal of Early Adolescence* 3:215–23.

Merten, Michael J., K.A.S. Wickrama, and Amanda L. Williams. 2008. "Adolescent Obesity and Young Adult Psychosocial Outcomes: Gender and Racial Differences." *Journal of Youth and Adolescence* 37:1111–22.

Moses, Tally. 2009. "Stigma and Self-Concept Among Adolescents Receiving Mental Health Treatment." *American Journal of Orthopsychiatry: Mental Health and Social Justice* 79:261–74.

Mustillo, Sarah A., Kimber L. Hendrix, and Markus H. Schafer. 2012. "Trajectories of Body Mass and Self-Concept in Black and White Girls: The Lingering Effects of Stigma." *Journal of Health and Social Behavior* 53:1–16.

Mustillo, Sarah A., Carol Worthman, Alaattin Erkanli, Gordon Keeler, Adrian Angold, and E. Jane Costello. 2003. "Obesity and Psychiatric Disorder: Developmental Trajectories." *Pediatrics* 111:851–59.

Muthén, Bengt O. 2011. "Applications of Causally Defined Direct and Indirect Effects in Mediation Analysis using SEM in MPlus."

Muthén, Linda K. and Bengt O. Muthén. 1998–2011. *MPlus Users Guide*. Los Angeles, CA: Muthén and Muthén.

National Heart, Lung, and Blood Institute Growth and Health Study Research Group. 1992. "Obesity and Cardiovascular Disease Risk Factors in Black and White Girls: The NHLBI Growth and Health Study." *American Journal of Public Health* 82:1613–20.

Ogden, Cynthia L., Margaret D. Carroll, Lester R. Curtin, Molly M. Lamb, and Katherine M. Flegal. 2010. "Prevalence of High Body Mass Index in US Children and Adolescents, 2007-2008." *JAMA* 303:242–49.

Phelan, Jo C., Bruce G. Link, and John F. Dovidio. 2008. "Stigma and Prejudice: One animal or two?" *Social Science and Medicine* 67:358–67.

Piaget, Jean. 1960. *The Psychology of Intelligence*. Oxford England: Littlefield, Adams.

Pierce, Jeanne Walsh and Jane Wardle. 1997. "Cause and Effect Beliefs and Self-Esteem of Overweight Children." *The Journal of Child Psychology and Psychiatry* 38:645–50.

Puhl, Rebecca M. and Chelsea A. Heuer. 2009. "The Stigma of Obesity: A Review." *Obesity*:1–24.

Puhl, Rebecca M. and Janet D. Latner. 2007. "Stigma, Obesity, and the Health of the Nation's Children." *Psychological Bulletin* 133:557–80.

Radloff, Lenore Sawyer. 1977. "The CES-D Scale: A Self-Report Depression Scale for Research in the General Population." *Applied Psychological Measurement* 1:
385–401.

Richardson, Laura P., Robert Davis, Richie Poulton, Elizabeth McCauley, Terrie E. Moffitt, and Avshalom Caspi. 2003. "A Longitudinal Evaluation of Adolescent Depression and Adult Obesity." *Archives of Pediatrics & Adolescent Medicine* 157:739–45.

Richardson, Stephen A., Norman Goodman, Albert H. Hastorf, and Sanford M. Dornbusch. 1961. "Cultural Uniformity in Reaction to Physical Disabilities." *American Sociological Review* 26:241–47.

Roberts, Robert E., Sally W. Vernon, and Howard M. Rhoades. 1989. "Effects of Language and Ethnic Status on Reliability and Validity of the Centre for Epidemiologic Studies-Depression Scale with Psychiatric Patients." *Journal of Nervous and Mental Disease* 177:581–92.

Sanchez-Villegas, Almudena, Adriano M. Pimenta, Juan J. Beunza, Francisco Guillen-Grima, Estefania Toldeo, and Miguel A. Martinez-Gonzalez. 2009. "Childhood and Young Adult Overweight/Obesity and Incidence of Depression in the SUN Project." *Obesity* 18:1443–48.

Schafer, Markus H., Kenneth F. Ferraro, and Sarah A. Mustillo. 2011. "Children of Misfortune: Early Adversity and Cumulative Inequality in Perceived Life Trajectories." *American Journal of Sociology* 116:1053–1091.

Scheff, Thomas. 1966. *Being Mentally Ill: A Sociology Theory*. Chicago, Il: Aldine.

Scott, Kate M., Michael Von Korff, Matthias C. Angermeyer, Corina Benjet, Ronny Bruffaerts, Giovanni de Girolamo, Josep Maria Haro, Jean-Pierre Lepine, Johan Ormel, Posada-Villa Jose, Hisateru Tachimori, and Ronald C. Kessler. 2011. "Association of Childhood Adversities and Early-Onset Mental Disorders with Adult-Onset Chronic Physical Conditions." *Archives of General Psychiatry* 68:838–44.

Smolak, Linda. 2004. "Body Image in Children and Adolescents: Where do We Go from Here?" *Body Image* 1(1):15–28.

Steinberg, Laurence and Amanda Sheffield Morris. 2001. "Adolescent Development." *Journal of Cognitive Education and Psychology* 2:55–87.

Stice, Eric and Sarah Kate Bearman. 2001. "Body-image and Eating Disturbances Prospectively Predict Increases in Depressive Symptoms in Adolescent Girls: A Growth Curve Analysis." *Developmental Psychology* 37:597–607.

Stice, Eric, Chris Hayward, Rebecca P. Cameron, Joel D. Killen, and C. Barr Taylor. 2000. "Body-Image and Eating Disturbances Predict Onset of Depression Among Female Adolescents A Longitudinal Study." *Journal of Abnormal Psychology* 109:438–44.

Tanti, Chris. 2003. "'Populars', 'Nerds', and 'Normals': Peer Group Categories and Adolescent Social Identity Processes." *Australian Journal of Psychology Supplement* 55.

Viner, Russell M. and Tim J. Cole. 2005. "Adult Socioeconomic, Educational, Social, and Psychological Outcomes of Childhood Obesity: A National Birth Cohort Study." *BMJ: British Medical Journal* 330:1354–57.

Wang, Aimin, Gary W. Peterson, and Lori Kaye Morphey. 2007. "Who is More Important for Early Adolescent's Developmental Choices?" *Marriage and Family Review* 42:95–122.

Wang, Youfa and May A. Beydoun. 2007. "The Obesity Epidemic in the United States--Gender, Age, Socioeconomic, Racial/Ethnic, and Geographic Characteristics: A Systematic Review and Meta-Regression Analysis." *Epidemiologic Reviews* 29:6–28.

Wardle, Jane and Lucy Cooke. 2005. "Impact of Obesity on Psychological Well-being." *Best Practice & Research Clinical Endocrinology & Metabolism* 19:421–40.

Wardle, Jane, Chloe Volz, and C. Golding. 1995. "Social Variation in Attitudes to Obesity in Children." *International Journal of Obesity* 19:562–69.

Wright, Eric R., William P. Gronfein, and Timothy J. Owens. 2000. "Deinstitutionalization, Social Rejection, and the Self-Esteem of Former Mental Patients." *Journal of Health and Social Behavior* 41:68–90.

Yu, Ching-Yun. 2002. Evaluating Cutoff Criteria of Model Fit Indices for Latent Variable Models with Binary and Continuous Outcomes. Unpublished Doctoral Dissertation. University of California at Los Angeles.

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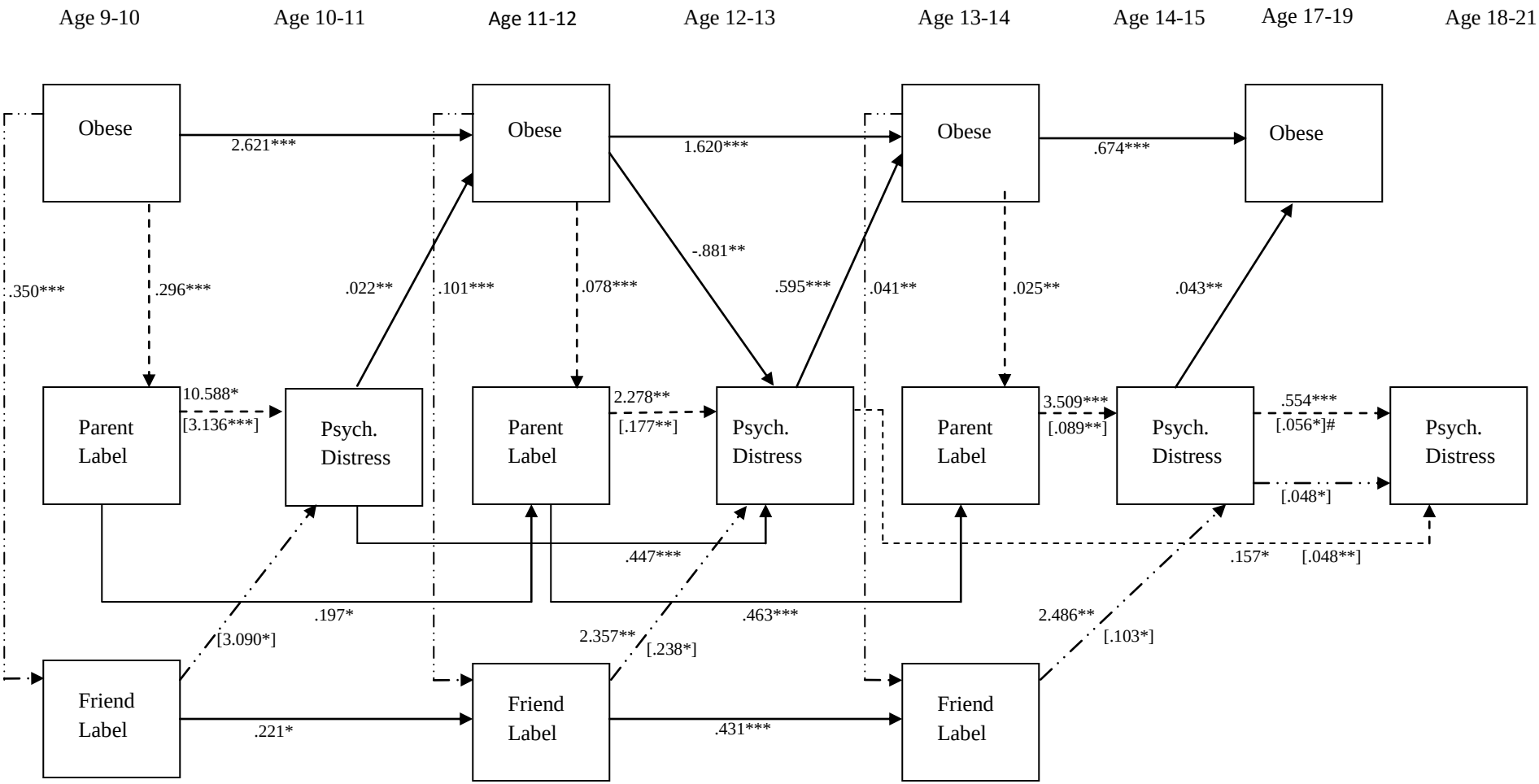
Table 1. Descriptive statistics of key variables by age, National Growth and Health Study (n=2123)

	White (48.99)	N	Black (51.01)	N	Range
Age 9-10					
Obese	7.78%	1158	17.15%	1201	0-1
Parent Labeling	15.62%	1165	29.68%	1213	0-1
Friend Labeling	21.37%	1165	27.62%	1213	0-1
Age 10-11					
Psychological Distress	25.01 (7.23)	1098	24.98 (6.73)	1164	0-51
Age 11-12					
Obese	9.91%	1060	20.77%	1141	0-1
Parent Labeling	12.42%	1071	26.49%	1155	0-1
Friend Labeling	17.65%	1071	23.29%	1155	0-1
Age 12-13					
Psychological Distress	24.42 (7.24)	1022	23.94 (6.85)	1122	2-51
Age 13-14					
Obese	10.24%	957	21.00%	1076	0-1
Parent Labeling	15.41%	967	24.45%	1088	0-1
Friend Labeling	19.34%	967	21.51%	1088	0-1
Age 14-15					
Psychological Distress	24.22 (8.21)	839	23.63 (7.32)	975	0-55
Age 17-19					
Obesity	10.29%	787	21.74%	759	0-1
Age 18-21					
Psychological Distress	12.99 (9.55)	998	13.75 (8.72)	1052	0-53

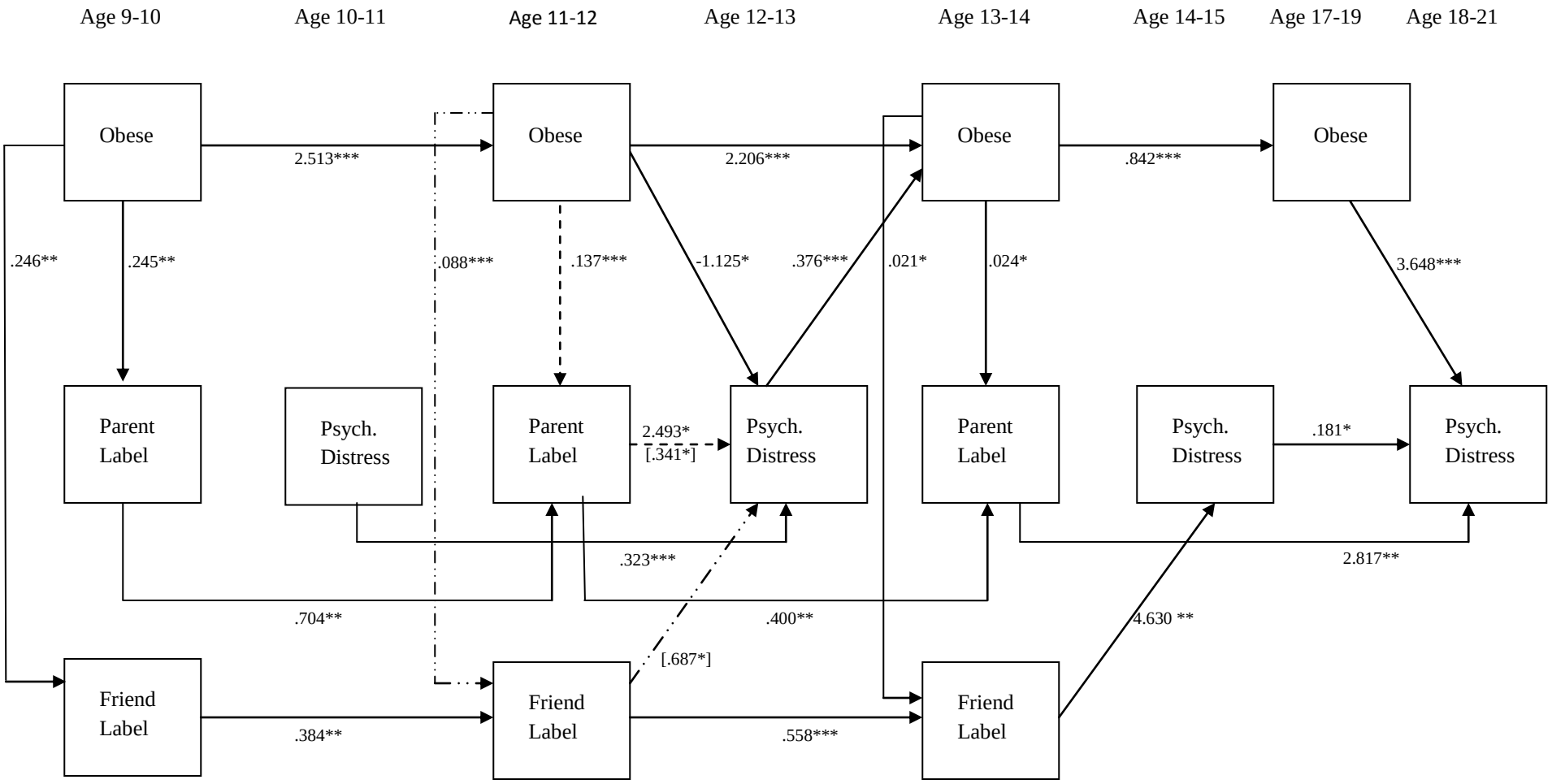
Note: Standard deviations in parentheses. Psychological distress was measured by perceived stress scale at ages 10-11, 12-13, 14-15 and CES-D at age 18-21.

Figure 1a. Significant direct and indirect effects of obesity, labeling, and psychological distress for white girls (n=1043)



Notes: Model controls for parent education, household income, and age at menarche. Significant indirect effects are in brackets. **p*<.05; ***p*<.01; ****p*<.001 (two-tailed tests); #There are two indirect effects here as these are the double-mediation paths. One is the indirect effect of obesity at ages 13/14 though parent labeling 13/14 and psychological distress 14/15, while the other is from obesity 13/14 through friend labeling 13/14 and psychological distress 14/15.

Figure 1b. Significant direct and indirect effects of obesity, labeling, and psychological distress for black girls (n=1080)



Note: Model controls for parent education, household income, and age at menarche. Significant indirect effects are in brackets. *p<.05; **p<.01; ***p<.001 (two-tailed tests).