Research Article

The effects of advertising models for age-restricted products and self-concept discrepancy on advertising outcomes among young adolescents

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Abstract

Research on discrepancies between the actual self and ideal self has examined self-discrepancies in knowledge, skills and stature but age-based self-discrepancies have only recently received attention and so we studied this phenomenon in young adolescents. In three studies we identified a product-category contextual cue that apparently caused adolescents to respond to an existing age-based self-discrepancy. Specifically we found that when the contextual cue was advertising for an age-restricted product, adolescents conformed to dissimilar young adult advertising models and diverged from similar adolescent models. This indicated that the contextual cue caused them to respond to an age-based self-discrepancy and use a product associated with the ideal self rather than the actual self. Importantly, this response was stronger among adolescents that were more dissatisfied with their age. With advertising for an age-unrestricted product, adolescents conformed to adolescent advertising models and diverged from young adult models. Industry policies for age-restricted products assume that similarity drives influence and therefore mandate that advertising models be young adults rather than adolescents. Our findings suggest this assumption is invalid for age-restricted products.
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Introduction

Recent research has uncovered novel ways that consumers respond to self-discrepancies, i.e., discrepancies between the actual and ideal selves. Packard and Wooten (2013) found that self-discrepancies in product knowledge increased word-of-mouth communication. Sobol and Darke (2014) showed that self-discrepancies in professional stature caused consumers to engage in fluid compensation improving their performance in other domains. Here we focus on age self-discrepancies because they have not received much attention but seem quite pervasive among certain groups, especially young adolescents (Barker & Galambos, 2005; Cantor, Norem, Niedenthal, Langston, & Brower, 1987) and seniors (e.g., Saucier, 2004; Weiss & Lang, 2012).

We develop and test a conceptual framework about adolescent self-discrepancy related to age and the effect this may have on adolescents' response to the age of advertising models. The framework posits that, in advertising, an age-restricted product can serve as a contextual cue that elicits self-discrepancy responses and causes divergence from similarly-aged advertising models. In contrast, an age-unrestricted product can serve as a contextual cue that elicits self-congruency responses and causes conformity to similarly-aged advertising models.

Understanding how adolescents respond to the age of advertising models for age-restricted products is substantively important. For decades, the tobacco and alcohol industries have agreed to use models that appear to be 25 years of age or older to avoid criticism that their advertising increases adolescent intent to smoke and drink (Beer Institute, 2006; Distilled Spirits Council of the United States, 2011; Tobacco Institute, 1990; Wine Institute, 2011). This policy is based on the assumption that model-viewer similarity drives social influence. However

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this policy may actually be misguided because, in our three studies, similarity did not drive social influence for the age-restricted product; dissimilarity did.

Conceptual framework

The self-concept is the set of beliefs one maintains about oneself (Howard, 2000; Oyserman, 2009) and it includes the actual self, i.e., the set of beliefs about who one actually is, and the ideal self, i.e., the set of beliefs about who one would ideally like to be (Markus & Nurius, 1986). Considering that the self-concept is often based on domain-specific self-beliefs, consumers can have an ideal self that resembles the actual self in some domains but not others. For instance, a consumer may see themselves as intelligent which may reflect an ideal self, but that same consumer may have an ideal-actual self-discrepancy on age or attractiveness.

Since self-discrepancies arouse negative affect and threaten self-esteem (Higgins, 1987), consumers may avoid facing such discrepancies (Weiss & Lang, 2012). Also since self-discrepancies create tension, consumers may be motivated to relieve this tension by trying to reduce the discrepancy (Higgins, 1987). Specifically consumers may engage in behaviors that reflect the ideal self rather than the actual self because over time this should bring the actual self in closer to the ideal self thus reducing the self-discrepancy (e.g., Gao, Wheeler, & Shiv, 2009; Rucker & Galinsky, 2008).

One key factor in determining whether consumers will respond to a self-discrepancy is the presence of a contextual cue related to that discrepancy. Boldero and Francis (2000), for instance, found that the location (home versus university) where a self-discrepancy was assessed had a larger effect on self-discrepancy responses as compared to other factors such as the importance of attaining the ideal self or the centrality of the domain to the self-definition.

We sought to identify contextual cues that may cause young adolescents to respond to an existing age-based self-discrepancy. Adolescents are especially likely to experience an age-based self-discrepancy because they are in a transition phase to young adulthood and are waiting to achieve the independence, freedom, and other ideals that young adulthood brings (Barker & Galambos, 2005; Cantor et al., 1987). However, most research on age-based discrepancies has focused on seniors' desire to be younger (e.g., Saucier, 2004; Weiss & Lang, 2012).

Instead, we examine adolescents' age-related self-discrepancy and how this may affect how they respond to age-restricted product advertising featuring models of different ages. Since previous research has shown that consumers respond to self-discrepancies when contextual cues are present (Boldero & Francis, 2000), adolescents may be more likely to respond to self-discrepancies when exposed to an advertisement for an age-restricted product that they are unable to purchase legally because they are too young. Indeed the inability to purchase a product is perceived as a threat to one's self-concept (Moore & Fitzsimons, 2014).

Advertisements often persuade by creating favorable associations between ad models and products (McCracken, 1989; Silvera & Austad, 2004). When a contextual cue such as advertising for an age-restricted product is present, adolescents' desire to use the product may depend on the characteristics of the advertising

model relative to the adolescents' self-concept. Adolescent models are similar to adolescent viewers and therefore possess characteristics associated with the actual self. Young adult models are youthful and yet have the independence and freedom that adolescents strive for; thus they possess characteristics associated with the ideal self (Arnett, 2000; Barker & Galambos, 2005). Middle-aged adults lack the youthfulness of adolescents and young adults and are, therefore, removed from the adolescent self-concept.

Several predictions arise from our conceptual framework. The first prediction is that when a contextual cue such as advertising for an age-restricted product is present, adolescents may desire to use products associated with the relevant ideal self; because behaving like the ideal self may help to move the actual self towards the ideal self. Potentially relevant to the ideal self, young adult advertising models are youthful but they also have the independence and freedom to purchase age-restricted products. Thus adolescents may conform to young adult advertising models and increase their product-use intent.

A second prediction is that, since the actual self reflects an undesirable state when self-discrepancies are present (Higgins, 1987), adolescents may diverge from similar adolescent advertising models when a contextual cue such as advertising for an age-restricted product is present, i.e., they may decrease their product-use intent. Consumers avoid undesirable selves (Markus & Nurius, 1986; Norman & Aron, 2003) and one way of doing this may be to avoid products associated with an undesirable self. In effect, in such cases, dissimilarity may drive conformity and similarity may drive divergence (c.f., Berger & Heath, 2007, 2008; Hilmert, Kulik, & Christenfeld, 2006). Furthermore, since consumers are influenced by marketing communications that are relevant to the self-concept (Escalas & Bettman, 2005; Hong & Zinkhan, 1995), middle-aged adult models may not affect adolescents. Formally:

H1. When adolescents view ads for an age-restricted product, adolescent advertising models will decrease product-use intent relative to young adult or middle-aged adult models; and additionally young adult models will increase product-use intent relative to middle-aged adult models not just adolescent models.

H2. When adolescents view ads for an age-restricted product, adolescent advertising models will decrease product-use intent, young adult models will increase product-use intent, and middle-aged adult models will have no effect, relative to a control ad.

Our framework does not suggest that adolescent conformity to dissimilar young adult models is a general response that occurs simply because they want to be older. Instead, this response is elicited by contextual cues such as advertisements for age-restricted products. Adolescents may respond differently to advertisements for products they consider relevant to the self, e.g., t-shirts or other clothing, when contextual cues related to self-discrepancies are absent. In such cases, consumers may respond to the need for consistency by preferring products that are congruent with how they actually see themselves (Malär, Krohmer, Hoyer, & Nyffenegger, 2011). Specifically, advertising for products that adolescents consider relevant to the self but

are age-unrestricted and hence unrelated to self-discrepancies may serve as contextual cues for adolescents to act on the need for consistency or self-congruency; and thus similar adolescent advertising models may be more persuasive than dissimilar young adult advertising models.

H3. When adolescents view ads for an age-unrestricted (age-restricted) product, adolescent advertising models will increase (decrease) product-use intent relative to young adult models.

Finally, if adolescents' divergence from similar adolescent models and their conformity to dissimilar young adult models are driven by an age-based self-discrepancy, then these effects should depend on the extent to which adolescents are dissatisfied with their age. Accordingly,

H4. When adolescents view ads for an age-restricted product, the more dissatisfied the adolescents are with their age, the more that young adult advertising models will increase product-use intent relative to adolescent models.

Pretests

The first pretest identified 12 advertising models that were demographically representative (both White and ethnic), attractive, and appeared to be adolescents (age 17), young adults (age 25), or middle-age adults (age 45). College and high-school students analyzed hundreds of headshots and the models that best fit the demographic criteria and that were considered attractive were used.

A second pretest verified that adolescents' perceptions of the products featured in the studies would fit our conceptual framework. Cigarettes were used in all studies, multivitamins were used as the control in Studies 1 and 3, and t-shirts were used in Study 2. Since the predicted effects were based on how products related to the adolescent self-concept, this pretest verified that adolescents considered cigarettes and t-shirts to be significantly more relevant to the self-concept than multivitamins. Details about both pretests are in the Appendix.

Study 1

Aim

In Study 1, we showed adolescents advertising for an age-restricted product, cigarettes, and manipulated advertising model age. The aim was to see if adolescents were affected by model age consistent with a self-discrepancy effect, i.e., if they were positively influenced by dissimilar young adult models and negatively influenced by similar adolescent models (H1, H2).

Method

Design and participants

The design was a three (adolescent, young adult or middle-aged adult models) × two (cigarette advertising versus control)

between-subjects factorial. Participants were 339 adolescents excluding 10 regular smokers (smoked 15+ days/month) recruited from 9th and 10th grades in ethnically diverse U.S. public schools (age range 14–16, mean age 14.7 years, 52% female).

Procedure and materials

Students that assented and had parental consent were released from class, given a 28 page full-color, professionally-produced, mockup magazine, and asked to review it. Each participant was randomly given one of six versions of the magazine corresponding to the six cell design. Three magazine versions included cigarettes ads. Participants saw ads for Belair, a real but lesser-known cigarette brand, and cigarette advertising models that were either adolescents or young adults or middle-aged adults. Participants saw four separate one-page cigarette ads that featured a White male, White female, ethnic male and ethnic female advertising model, all from the same age group. Ad order was randomized and the ads mimicked an integrated marketing campaign by using a consistent green background, model visual (headshot), product visual and tagline.

Three matched control magazines showed the same models on the same pages, i.e., a White male, White female, ethnic male and ethnic female that were either adolescents or young adults or middle-aged adults; but the pages showed a multivitamin package. The cigarette and control pages were stylistically similar (e.g., green backgrounds) and the other magazine pages were identical. We showed the same models, i.e., we used same-age control models, rather than a no-exposure control because policy researchers recommend this to equalize exposure time and demand characteristics (Andrews & Maronick, 1995). We showed the models with a multivitamin package because this was a similarly-priced product that could be shown with the different aged models but adolescents considered this product irrelevant to the self. (See pretest in Appendix.)

Measures

After viewing the stimulus magazine, participants completed a survey about it and their intent to use products that were advertised and not advertised therein. The main outcome measure was product-use intent for cigarettes using two standard items that correlate highly with adolescent smoking (Pierce, Farkas, Evans, & Gilpin, 1995). Participants also rated the model ages and ad age-appropriateness and reported their demographics (see Appendix).

Results

Manipulation and control checks

Participants accurately judged the models' age groups showing 98% accuracy for adolescents, 97% for young adults and 93% for middle-aged adults; with no effects for cigarette advertising versus control. For ad age-appropriateness, there was no main effect for model age ($F(2,333) = .36$ NS), no main effect for cigarette advertising versus control ($F(1,333) = .01$ NS) and no interaction ($F(2,333) = .89$ NS).

Main results

Product-use intent was analyzed using a three (model age) × two (cigarette advertising versus control) ANOVA. There was a model age effect ($F(2,333) = 3.16$, $p < .05$), no cigarette advertising versus control effect ($F(1,333) =.02$ NS), but a two-way interaction ($F(2,333) = 5.64$, $p < .01$).

Supporting H1, when adolescents viewed ads for the age-restricted product of cigarettes, adolescent advertising models decreased product-use intent ($M = 1.80$) relative to young adult models ($M = 3.22$, $t = 4.15$, $p < .01$) and middle-aged adult models ($M = 2.45$, $t = 1.99$, $p < .05$); and young adult models increased product-use intent relative to middle-aged adult models ($t = 2.15$, $p < .05$). Supporting H2, adolescent cigarette models decreased product-use intent relative to same-age control models ($M = 1.80$ vs. 2.59, $t = 2.31$, $p < .05$), young adult cigarette models increased product-use intent relative to same-age control models ($M = 3.22$ vs. 2.38, $t = 2.47$, $p < .05$), and middle-aged adult cigarette models had no effect on product-use intent relative to same-age control models ($M = 2.45$ vs. 2.42, $t = .09$, NS; Fig. 1). Control means did not differ (p's > .50).

Summary

Study 1 assessed adolescents' response to different aged models in advertising for an age-restricted product: cigarettes. Similar adolescent cigarette models, relative to dissimilar young adult cigarette models, lowered adolescents' product-use intent. Similar adolescent cigarette models also decreased intent relative to middle-aged adult cigarette models and same-age control models. Finally, dissimilar young adult cigarette models increased intent relative to middle-aged adult cigarette models and same-age control models.

Study 2: moderation by product type

Aim

Study 2 investigated whether the advertising model age effect was moderated by product type: age-restricted or age-unrestricted (H3). If the advertised product was relevant to the adolescent self and age-unrestricted, a self-congruity effect was predicted: Adolescents would be more influenced by similar adolescent models than dissimilar young adult models. If the product was age-restricted as in Study 1, a self-discrepancy effect was predicted: Adolescents would be more influenced by dissimilar young adult models than similar adolescent models.

Method

Design and participants

The design was a two (adolescent versus young adult models) × two (cigarettes or age-restricted product versus t-shirts or age-unrestricted product) between-subjects factorial. Participants were 271 adolescents excluding 5 regular smokers (smoked 15+ days/month) recruited similarly to Study 1 (age range 14–16, mean age 14.4, 53% male).

Procedure, materials and measures

Each participant was randomly given one of four versions of the magazine created for Study 1, corresponding to the four cell design. Participants saw the same four Belair cigarette ads on the same four magazine pages as Study 1, or instead on those pages they saw four stylistically similar ads for t-shirts by Tripp, a real but lesser-known t-shirt brand. A pretest indicated that adolescents considered both cigarettes and t-shirts relevant to the self. The cigarette and t-shirt ads depicted either the four adolescent models or the four young adult models from Study 1. See Appendix for additional details.

Results

Model age-appropriateness

There was a product effect ($F(1,136) = 7.06$, $p < .01$) indicating that the models were considered more appropriate for t-shirts versus cigarettes, but no model age effect ($F(1,136) = .35$ NS). A two-way interaction ($F(1,136) = 7.06$, $p < .01$) indicated that the adolescent models were considered more appropriate than the young adult models for t-shirts ($M = 3.70$ vs. 2.66, $t = 3.43$, $p < .01$); while the adolescent models were considered marginally less appropriate than the young adult models for cigarettes ($M = 2.13$ vs. 2.87, $t = 1.79$, $p = .08$).

Main results

Product-use intent was analyzed using a two (model age) × two (product type) ANOVA. There was no model age effect ($F(1,267) = .10$ NS), but a product type effect ($F(1,267) = 96.20$, $p < .01$), and a two-way interaction ($F(1,267) = 7.84$, $p < .01$). Supporting H3, adolescent versus young adult models in cigarette ads decreased product-use intent ($M = 1.32$ vs. 1.63, $t = 1.98$, $p < .05$), while adolescent versus young adult models in t-shirt ads increased product-use intent ($M = 2.87$ vs. 2.49, $t = 2.00$, $p < .05$; Fig. 2).

Summary

When adolescents saw advertising for the age-restricted product of cigarettes, similar adolescent models decreased product-use intent relative to dissimilar young adult models. However when they saw advertising for the age-unrestricted product of t-shirts, adolescent models increased product-use intent relative to young adult models. These findings are consistent with Study 1 and are contrary to the rival hypothesis that adolescents were uniformly persuaded by young adult advertising models because they wanted to be older. Instead, the findings suggest that the positive effect of dissimilar (versus similar) models was elicited by a contextual cue: advertising for an age-restricted product. The effect reversed when a different cue was present: advertising for an age-unrestricted product.

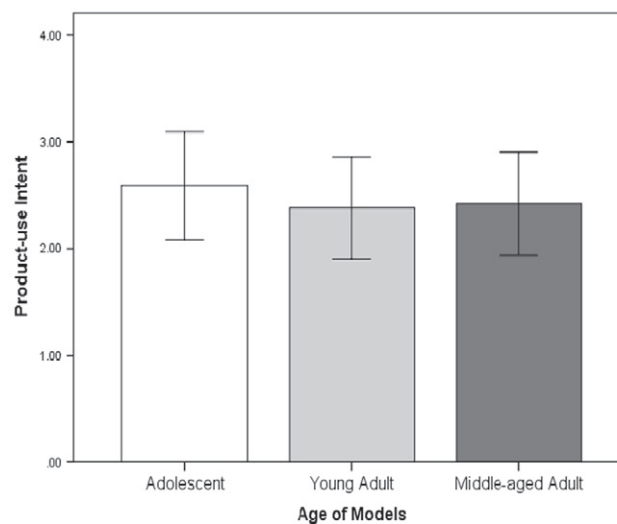## Study 3: moderation by age dissatisfaction

Aim

Study 3 tested a fundamental prediction based on self-discrepancy theory: Effects should be strongest among those with

A. Models Promoted an Age-restricted Product
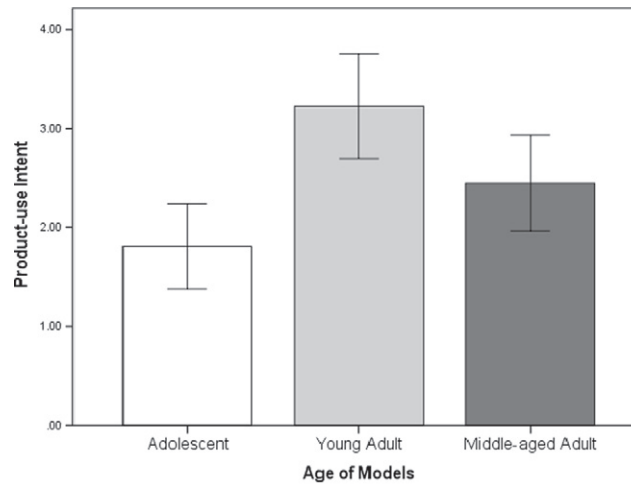
B. Models were in Control Ads

Note -- For models promoting the age-restricted product, adolescent < middle-aged adult < young adult; also
adolescent < same-age control and young adult > same-age control, on product-use intent, p's <.05.

Fig. 1. Model age effects on adolescents' product-use intent for an age-restricted product (cigarettes): Study 1. A. Models promoted an age-restricted product. B. Models were in control ads. Note — For models promoting the age-restricted product, adolescent < middle-aged adult < young adult; also adolescent < same-age control and young adult > same-age control, on product-use intent, p's < .05.

the greatest self-dissatisfaction. Thus we measured adolescents' explicit dissatisfaction with their age as an individual difference variable and examined if this moderated the effect of advertising model age for the age-restricted product (H4).

Methods

Design and participants

The design was a two (adolescent versus young adult models) × two (cigarette advertising versus control) between-subjects factorial. Explicit age dissatisfaction was included as a measured continuous variable. Participants were 219 adolescents

excluding 19 regular smokers (smoked 15+ days/month), with 188 answering the explicit age dissatisfaction question. Participants were recruited similarly to prior studies (age range 13–16, mean age 14.7, 55% male).

Procedure and materials

Each participant was randomly given one of four versions of the stimulus magazine corresponding to the four cell design: adolescent or young adult models on cigarette advertising or control pages. The cigarette pages co-advertised cigarettes and a radio station. Each page showed a model headshot and stated: "Radio Station Call-in Winner: (name), Hometown: (city), and

A. Models Promoted an Age-restricted Product (Cigarettes)
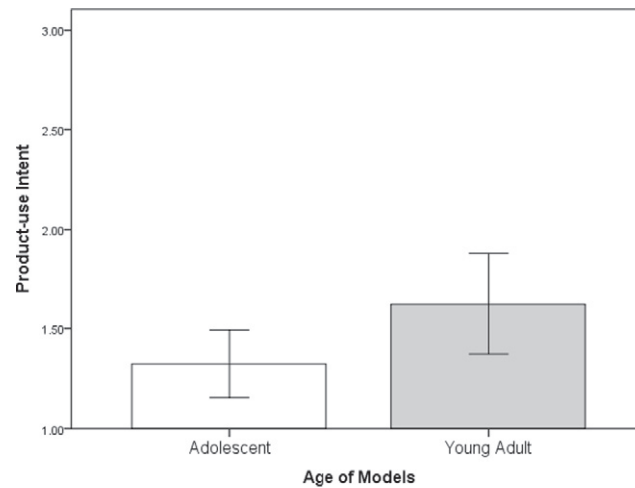
B. Models Promoted an Age-unrestricted Product (T-shirts)
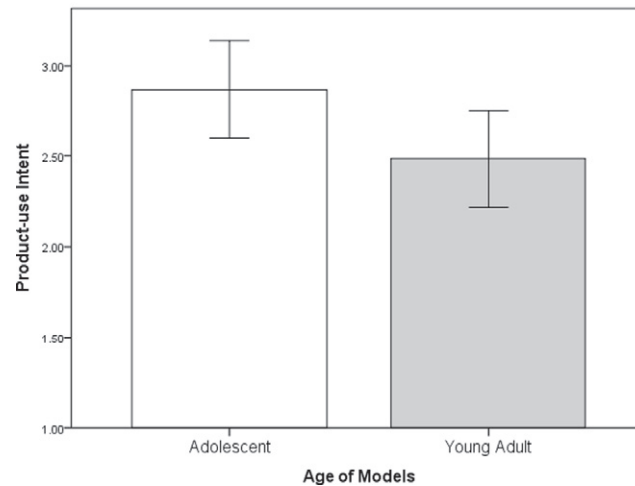
Note – Model age effects on product-use intent for each promoted product, p's <.05.

Fig. 2. Model age effects on adolescents' product-use intent: moderation by product type (Study 2). A. Models promoted an age-restricted product (cigarettes). B. Models promoted an age-unrestricted product (t-shirts). Note — Model age effects on product-use intent for each promoted product, p's < .05.

Habits: Smokes Cigarettes ..." or similar wording. The models and control pages were from Study 1.

Measures

The survey (see Appendix) measured product-use intent (Pierce et al., 1995), desired age (Barak, 2009), actual age, model age (open-ended), and model age-appropriateness. Our measure of age dissatisfaction was based on a standard measure of self-discrepancy or self-dissatisfaction used in past studies: The difference between an individual's desired position on a particular trait and their actual position (e.g., Higgins, Shah, & Friedman, 1997). Specifically we calculated the difference between the explicitly stated desired age and actual age. While this measure has not previously been used to assess age dissatisfaction, it has been used to measure other similar types of discrepancies including body weight (Arroyo, 2014), physical appearance

(Yu, Kozar, & Damhorst, 2013), academic aptitude (Landa & Bybee, 2007), physical strength (Brunet, Sabiston, Castonguay, Ferguson, & Bessette, 2012) and product knowledge (Packard & Wooten, 2013).

Results

Manipulation and control checks

Participants estimated the adolescent models to be about 18.1 years old and the young adult models to be about 26.4 years old. For model age-appropriateness, there was a main effect for cigarette advertising versus control ($F(1,215) = 14.88$, $p < .01$) indicating the models were considered less appropriate for cigarettes; but there was no main effect for model age ($F(1,215) =.05$ NS) and no interaction ($F(1,215) = .05$ NS).

Age dissatisfaction

The age dissatisfaction mean was 2.2 (SD = 3.7). As expected, this individual difference variable of existing age dissatisfaction was unaffected by model age ($F(1,184) = .60$ NS), cigarette advertising versus control ($F(1,184) = .02$ NS) or their interaction ($F(1,184) = .24$ NS).

Main results

Product-use intent was analyzed using a two (model age) × two (cigarette advertising versus control) ANCOVA with age dissatisfaction as a third continuous variable. There was a main effect for age dissatisfaction ($B = .10$, $F(1,180) = 6.00$, $p < .01$), no model age effect ($F(1,180) = 2.90$ NS) and no two-way interactions (F's < .05 NS); but a three-way interaction ($F(1,180) = 6.30$, $p < .01$). Decomposing the three-way interaction, for cigarette advertising as expected there was a model age by age dissatisfaction two-way interaction ($F(1,96) = 5.49$, $p < .05$) and an age dissatisfaction main effect ($F(1,96) = 4.60$, $p < .05$) but no model age main effect ($F(1,96) = 1.34$ NS). For control as expected there was no two-way interaction ($F(1,84) = 1.53$, NS) and no main effects (F's < 2.1 NS).

For cigarette advertising, we decomposed the model age by self-discrepancy interaction by conducting a floodlight analysis and searching for the Johnson–Neyman point when the model age effect became significant, $p < .05$ (Mohr, Lichtenstein, & Janiszewski, 2012; Spiller, Fitzsimons, Lynch, & McClelland, 2013). Among adolescents with age dissatisfaction of 1.3 or higher, product-use intent was significantly greater after exposure to young adult versus adolescent cigarette models. Moreover this effect strengthened as age dissatisfaction increased, supporting H4 (Fig. 3).

Summary

Study 3 found that adolescents' explicit age dissatisfaction moderated the extent to which they attempted to resolve an age-based self-discrepancy by conforming to dissimilar young adult advertising models when prompted by a contextual cue: advertising for the age-restricted product of cigarettes. The greater the age dissatisfaction, the more adolescents were positively influenced by dissimilar young adult models rather than by similar adolescent models for cigarettes.

General discussion

Summary

We studied how adolescents responded to the age of advertising models and found that this depended on whether the advertised product was age-restricted or age-unrestricted. Adolescents (ages 14–16) diverged from cigarette models that resembled the actual self (17–18 year old adolescents) and reported lower product-use intent, whereas they conformed to cigarette models with characteristics of the ideal self (25–26 year old young adults); and these effects were stronger with more explicit age dissatisfaction. Moreover adolescents were unaffected by cigarette models that were very dissimilar and irrelevant to their self-concept (45 year old middle-aged adults). Finally, effects reversed for the age-unrestricted product of t-shirts; similar adolescent advertising models had more social influence than dissimilar young adult models.

Theoretical contribution

Demonstrating an instance in which consumers diverge from similar models and conform to dissimilar models is important since previous research and theory emphasize that similarity encourages conformity (e.g., Aaker, Brumbaugh, & Grier, 2000; Berger & Heath, 2007, 2008; Chang, 2008; Day & Stafford, 1997; Forehand, Deshpandé, & Reed, 2002; Grohmann, 2009). Likewise prior work indicates that dissimilarity encourages divergence even when dissimilar others are liked (Berger & Heath, 2007, 2008; Hilmert et al., 2006).
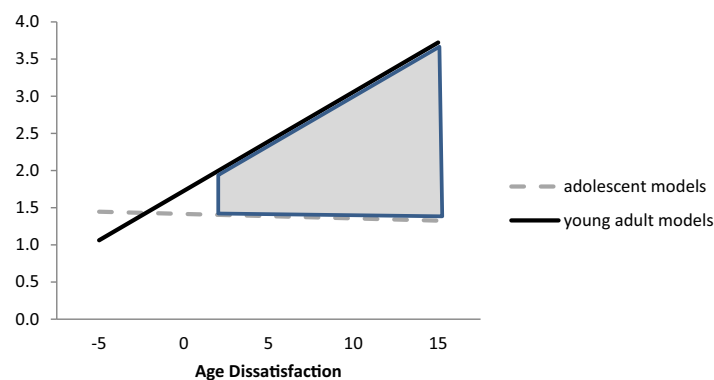
Note – Model age effect on product-use intent for 1.3+ age dissatisfaction (M=2.2, SD=3.7), p < .05.

Fig. 3. Model age effects on adolescents' product-use intent for an age-restricted product (cigarettes): moderation by age dissatisfaction (Study 3). Note — Model age effect on product-use intent for 1.3+ age dissatisfaction (M = 2.2, SD = 3.7), p < .05.

Important public policy is based on the assumption that similar advertising models have more influence on viewers. The longstanding and accepted industry policy for cigarette and alcohol advertising specifies that advertising models must appear to be 25 years of age or older to minimize their effects on underage adolescents (Beer Institute, 2006; Distilled Spirits Council of the United States, 2011; Tobacco Institute, 1990; Wine Institute, 2011). However, we found that models for the age-restricted product of cigarettes that were about 25 years of age actually increased product-use intent while adolescent models decreased it. Future research should examine other factors that may lead consumers to diverge from similar others and conform to dissimilar others.

This research also contributes theoretically to our understanding of how adolescents respond to important self-discrepancies. The attainment of independence and freedom is a challenging developmental goal for adolescents (Arnett, 2000; Barker & Galambos, 2005; Cantor et al., 1987), but little is known about the implications of this self-concept discrepancy on adolescent consumer behavior. Future research should examine how this and other self-concept discrepancies may affect adolescent consumption.

Consumers in other age groups may also respond differently than expected to marketing stimuli because of age-related self-discrepancies. For example, recent research indicates that seniors with an age-related self-discrepancy may dissociate from similar others (Weiss & Lang, 2012). Specific advertisements could therefore act as contextual cues which could then lead seniors to respond to an existing age self-discrepancy and affect the way they respond to advertised products, and so this suggests yet another research extension.

Policy implications

We provide novel evidence that cigarette models that appear to be 25–26 years old, models that are permitted and in fact encouraged, can increase adolescents' intent to smoke and that it may be necessary to use much older models. We also found that 17–18 year old cigarette models were counterproductive among adolescents which might possibly explain why marketers have agreed not to use them. Based on our findings, government officials and policymakers might want to consider requiring that models for age-restricted product be at least 45 years old. This requirement might possibly pass constitutional free-speech challenges, because self-regulation regarding model age already exists.

Methodological details Appendix

Pretest: model selection

We assembled hundreds of headshots of models that appeared to be adolescents (age 17), young adults (age 25) or middle-aged adults (age 45) from photography websites. We sought 12 demographically representative models: a White and ethnic male and female from each of these three age groups. To choose these models, we recruited 183 undergraduates (age range 18–26, mean age 20.6, 73% female) and asked each to rate 100 models.

We selected 12 models with the best ratings on attractiveness and the target age, gender and ethnicity; and there was 85% agreement on age, 99% on gender, 96% on ethnicity and 88% on attractiveness with uncorrelated ratings. Then we showed these 12 models to 156 high school students (age range 14–17, mean age 15.1, 53% female); and they showed 84% agreement on age, 100% on gender, 94% on ethnicity and 76% on attractiveness with uncorrelated ratings.

The measures used were as follows (scale: 1 = yes, 0 = no):

1. How old is this person: child (10 years old), adolescent (17 years old), young adult (25 years old), middle-aged adult (45 years old) or elderly adult (65 years old)?
2. Is this person male or female?
3. Is this person ethnic (non-White) or non-ethnic (White)?
4. Is this person attractive or unattractive?

Pretest: product relevance to self

Qualtrics Panel Management (http://www.qualtrics.com/panel-management/) was used to recruit 41 adolescent participants (age range 14–16, mean age 15.0, 68% female). The adolescent participants indicated whether they considered cigarettes, t-shirts or multivitamins to be relevant to the self on two-item scales; see below. The data were analyzed using a repeated measures ANOVA with product type as the repeated factor ($F(2,80) = 13.70$, $p < .001$). The results indicated that adolescents considered cigarettes (M = 3.96) and t-shirts (M = 4.34) to be equally relevant to the self (t = 1.23 NS). Multivitamins (M = 2.84) were rated significantly lower than both cigarettes (t = 4.05, p < .001) and t-shirts (t = 4.85, p < .001).

The measures used were as follows (scale: 1 = disagree strongly, 7 = agree strongly):

Self-relevance of cigarettes (alpha = .85, correlation = .74)

1. Smoking cigarettes reflects who a person is.
2. Smoking cigarettes tells a lot about a person.

Self-relevance of t-shirts with designs (alpha = .71, correlation = .55)

1. Wearing t-shirts with designs reflects who a person is.
2. Wearing t-shirts with designs tells a lot about a person.

Self-relevance of multivitamins (alpha = .86, correlation = .75)

1. Using multivitamins reflects who a person is.
2. Using multivitamins tells a lot about person.

Study 1 measures

Product-use intent (alpha = .80, correlation = .68)

1. How much do you agree or disagree that in the future you might smoke one puff or more of a cigarette?

2. How much do you agree or disagree that you might try out cigarette smoking for a while?

Scale: 1 = agree strongly, 7 = disagree strongly; later reverse coded.

Model age

How old is this person: child (10 years old), adolescent (17 years old), young adult (25 years old), middle-aged adult (45 years old) or elderly adult (65 years old)?
Scale: 1 = yes, 0 = no.

Ad Age-appropriateness

Would the ads in this magazine appeal to people in your age group?
Scale: 1 = definitely no, 5 = definitely yes.

Study 2 measures

Product-use intent
Would you purchase or use Belair cigarettes?
Would you purchase or use a Tripp t-shirt?
Scale: 1 = definitely yes, 5 = definitely no; later reverse coded.

Model age-appropriateness (alpha = .84)

For these pages, these models are bad (1) — good (7), these models are not okay (1) — okay (7), and these models will hurt (1) — help (7) the product.

Study 3 measures

Product-use intent (alpha = .91)

1. How much do you agree or disagree that in the future you might smoke one puff or more of a cigarette?
2. How much do you agree or disagree that you might try out cigarette smoking for a while?
3. If one of your best friends were to offer you a cigarette you would smoke it.
4. You might smoke a cigarette.

Scale: 1 = agree strongly, 7 = disagree strongly; later reverse coded

Explicitly stated desired age (alpha = .77, 14% nonresponse)

1. I would like to feel as though I were…
2. I would like to do things as though I were…
3. I would like to look as though I were…

Participants filled in an age for each question.

Model age (open-ended)

How old do you think these models are?
Participants filled in an age.

Model age-appropriateness (alpha = .85)

For these pages, these models are bad (1) — good (7), these models are not okay (1) — okay (7), and these models will hurt (1) — help (7) the product.

Mock-up magazine used in all studies

Page 1, Cover
Page 2, Filler Ad: Honda Civic Automobile — "Reverse Your Thinking" (Honda Civics driving up a structure.)
Page 3, Magazine Table of Contents
Page 4, Filler Ad: Hormel Deli Meat — "Something Great" (A picture of a deli sandwich.)
Page 5, Filler Ad: Ecco Shoes — "Ecco" (A white shoe is bent at the tip and a butterfly rests on it.)
Page 6, Article: Gift Guide. (Shows various products including a jacket and phone to give as gifts.)
Page 7, Article: Gift Guide Continued. (Shows more products to give as gifts.)
Page 8, Stimulus ad
Page 9, Stimulus ad
Page 10, Article: Guy Confessions. (A student accidentally dresses up in a grass skirt because he forgot when spirit week started.)
Page 11, Filler Ad: Pepperidge Farm Cookies — "Every Taste Has a Feeling" (Chocolate and vanilla cookies.)
Page 12, Filler Ad: Mini Cabrio Automobile — "Make the Street Your Canvas" (A convertible car on a road.)
Page 13, Filler Ad: Welch's Grape Juice — "Yeah, That's Right" (A bottle of juice with antioxidants.)
Page 14, Article: Streamlining your morning routine. (Provides suggestions for saving time.)
Page 15, Article: Happiness Flash. (Describes how holding hands with a friend reduces stress.)
Page 16, Filler Ad: Palm Centro Cellular Phone — "It's a Palm Thing" (A cellular phone open with an image.)
Page 17, Article: Survivor. Where Are They Now? (Two previous cast members from Survivor that are now a couple are interviewed.)
Page 18, Filler Ad: Spam Meat "AM PM" (Two cans of Spam with the letters AM PM.)
Page 19, Article: Truth or Dare. I Pinched their Mascot! (A girl takes up a dare to pinch another team's mascot.)
Page 20, Article: Truth or Dare. I Ruined our Romantic Date. (A girlfriend accidentally sets her menu on fire while celebrating her anniversary with her boyfriend at a restaurant.)
Page 21, Article: Truth or Dare. I Serenaded My Crush! (A girl accepts a dare to call her boyfriend and sing to him despite the lack of her singing abilities.)
Page 22, Filler Ad: Campbell's Soup — "M'm M'm Good! Possibilities" (A bowl of chicken noodle soup.)

Magazine cover

Stimulus cigarette advertisements and models
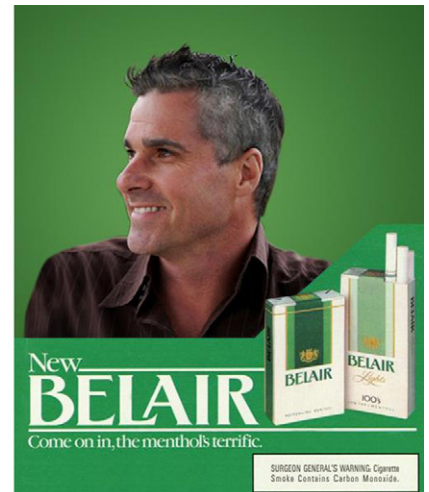
Adolescent Model   Young Adult Model   Middle-aged Adult Model

Page 28, Filler ad: Chaps Clothing — "Established 1978" (Three people on a boat.)

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