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Literature Review Report

Youth Risk Perception and Decision-Making Related to Health Behaviors in the COVID-19 Era

Decades of psychological research examining risk perception and decision-making of youth and young adults in the health domain (e.g., as related to HIV/AIDS, substance use, sexual reproductive health, and violence and injury prevention) have important implications for the design of effective behavioral intervention strategies to reduce COVID-19 transmission. The primary goal of this report prepared by the American Psychological Association (APA) for the World Health Organization (WHO) is to present the best scientific information that the field of psychology has to offer to further inform WHO's COVID-19 prevention efforts directed at youth and young adults. More specifically, this report focuses on a key set of potential drivers and barriers outlined in eight key questions (listed below) that were posed by WHO's Behavioural Insights Unit for close examination. Attention is also directed to the most common – and most effective -- behavioral interventions and to considerations unique to the specified 15- to 30-year-old age group that should be taken into account when designing behavior change strategies.

In a discussion of the decision-making competence of youth and young adults, it is critical to not be subject to hindsight or outcome bias and to keep in mind that young people may:

- face many difficult decisions, as they form their personal identity and develop behavior patterns (e.g., careers, intimacy, and avocations);
- learn by experimentation and trial-and-error as essential parts of their developmental process;
- maintain different goals than adults, consistent with their life stage and social milieu;
- experience constraints in their options and ability to recover from mistakes and misfortune due to social inequities; and
- take unintended risks due to lack of knowledge.

Methodology

A rapid expert consultation process, modeled after that employed by the National Academies of Sciences, Engineering, and Medicine, was adopted for this literature review report, given the short, one-month time frame and the very broad range of topics to be covered. The report addresses the following eight questions, posed by WHO, pertaining to youth and young adults 15- to 30-years of age. It draws from research areas that include: risk perception, decision-making, risk-taking, cognitive bias, social influences and norms, self-efficacy, environmental factors, and behavioral interventions related to health conditions:

- 1) What is the latest evidence on youth decision making and risk taking?
- 2) How do cognitive biases (e.g., optimism bias, present bias, loss aversion) affect risk perception and behaviours in youth? Is there evidence that youth are more or less susceptible to some of these cognitive biases than adults?

- 3) How do social influences and norms (e.g., how one is viewed by peers, perceived norms) influence risk perception and behaviours in youth? Is there evidence that youth are more prone to social influences and norms than adults?
- 4) For which topics do other youth, versus adults, serve as key sources of influence?
- 5) How does self-efficacy influence risk preventive behaviours in youth?
- 6) What are some key environmental factors (e.g., economic, information sources) that are important to consider when targeting youth?
- 7) What are the most common behavioural interventions to influence risk behaviours of youth (e.g., education, skills building, social)? Which have shown to be the most effective?
- 8) What might be some unique considerations when designing strategies for youth (e.g., talking to them not at them)?

The expert consultation process was initiated by outreach to 40 leading psychologist experts, across these areas, including the presidents of ten relevant APA Divisions in such areas as Developmental Psychology, Clinical Child and Adolescent Psychology, Health Psychology, and Addiction Psychology. Based on these experts' nominations, we enlisted 11 psychologists to contribute to the report based on their expertise in relation to the issues covered in the questions and their availability. Each of the psychologists independently reviewed the literature related to one or two of the eight WHO questions and submitted a brief report to APA. In order to reduce the risk of conflict of interest and bias, the recruitment process was structured to ensure that each of the eight questions listed above was addressed by two or three experts independently. When discrepancies arose, consensus was reached through an iterative approach.

To answer the questions, the experts drew on their knowledge of published, peer-reviewed research, including review articles that they or others had written. Their criteria for including or excluding studies were relevance to the question (assessed subjectively), strength of methodology and evidence, and date of publication. Studies prior to 1995 and not peer reviewed were not included. The key search terms used by contributors included: risk perception, social norms, self-efficacy, risk-taking, and systematic review. While PsycInfo was the most common database accessed for these searches, PubMed, EBSCO Host, and university on-line libraries were also used. Contributors intentionally searched for studies with non-European/White/Western samples.

A developmental psychologist consultant was hired by APA to consolidate the brief reviews provided for each question. The 112 references cite research from many studies, including review articles. The report emphasizes consistent findings and conclusions, while noting unresolved scientific issues. Any inconsistencies were addressed by checking references or consulting individual experts.

The experts reviewed and provided feedback on the draft of their section(s) and received the final version for approval. Two independent psychologists who did not contribute to the literature review served as expert reviewers of the full report, conducting supplementary targeted literature searches, as needed. The Appendix lists all 13 contributing psychologists, with links to information about their professional background and specific areas of expertise.

Recent Research on Youth Decision-making and Risk Taking (Question 1)

By the mid-teen years, the cognitive decision-making processes of young people are similar to those of adults in many ways (Fischhoff, 2008). These processes include both strengths (e.g., automatic encoding of the frequency of observed events when assessing risks) and weaknesses (e.g., difficulty adjusting for

sampling bias in those observations). Young people have more knowledge about some risks than adults (e.g., for topics addressed in school programs) and less knowledge about others (Bruine de Bruin et al., 2007). Like adults, young people tend to be underconfident in domains that they know well and overconfident in unfamiliar domains (Fischhoff & Broommell, 2020). Like adults, the decision-making competence of young people reflects the extent of their prior opportunities to master relevant skills (Bruine de Bruin et al., 2010; Parker et al., 2018).

Nevertheless, adolescents' decision-making abilities are not as mature as those of adults in ways that often lead young people to take risks in situations in which adults might find it easier to behave prudently (Reyna & Farley, 2006). The following three aspects of adolescent decision-making are especially important. As compared to adults, adolescents are:

- *more sensitive to rewards* (Cauffman et al., 2010; Galván, 2013), called "sensation-seeking," the inclination to pursue rewarding and exciting experiences, even in the face of risks (Steinberg et al., 2018). Importantly, adolescents are no worse than adults at perceiving risks, but are more likely than adults to focus on the potential rewards of risky decisions and to trade off risks for rewards (Reyna et al., 2011). As a consequence, educating adolescents about the risks of congregating with others is not likely to be effective, since young people are well aware of this but nevertheless find the rewards worth the risk (Steinberg, 2015).
- *more attentive to the immediate consequences of their decisions* than to the longer-term ones, which makes it difficult to encourage young people to ignore the prospect of an immediate reward and attend to more distant outcomes, such as illnesses or disabilities that may not manifest themselves until many years later (Steinberg et al., 2009).
- *more impulsive, with more difficulty restraining themselves* (Crone & Steinbeis, 2017). Importantly, adolescents are as competent as adults in exercising self-control, except in more emotionally or socially rousing conditions where young people's self-control is more easily compromised (Icenogle et al., 2019). Social pressure, which varies in strength across situations, can also increase the chances of young people acting against their better judgment (e.g., in unstructured group settings). Furthermore, as compared to adults, they often have less control over their social environment.

Psychological research also suggests that adolescents are also more tolerant of ambiguity and uncertainty, less loss averse, less able to incorporate negative consequences into risk perceptions, more literal in their thinking, and less focused on the "gist" or bottom-line of decision options (Cauffman et al., 2010; de Water et al., 2014; Ernst et al., 2014; Moutsiana et al., 2013; Steinberg, 2008; Tymula et al., 2012; White et al., 2018; but see Lloyd et al., 2020). Moreover, recent studies indicate that this pattern of differences, known as the "psychosocial maturity gap," is common throughout diverse regions of the world (Icenogle et al., 2019).

Role of Cognitive Biases (Question 2)

Counter to the popular belief that adolescents take greater risks due to a felt sense of general invulnerability to danger, some researchers contend that adolescents do not exhibit greater "optimism bias" than adults; to the contrary, they often feel more vulnerable (Fischhoff, 2000; Quadrel et al., 1993). Some suggest that an optimism bias may be most influential in early adulthood (Millstein & Halpern-Felsher, 2002).

Research on students' judgments of specific health-related risks (Lapsley & Hill, 2009) highlights a related construct of *subjective invulnerability*, further differentiated as *danger invulnerability* (e.g., "Special problems, like getting an illness or disease, are not likely to happen to me") and *psychological invulnerability* (e.g., "The opinions of other people just don't bother me"). Both were found to be more predictive of risk-taking behaviors than a general optimism bias.

Research also suggests that adolescents and young adults are particularly susceptible to, or biased toward, peer cues and judgments. For example, adolescents internalize peer rejection to a greater extent than adults, and do not exhibit the same self-protective biases as adults when faced with evaluative threats from their peers (Rodman et al., 2017). In one study, the following three cognitive biases were found to increase linearly across the ages 10 to 17: 1) interpretations that peers are threatening them; 2) negative attributions about social failures; and 3) overgeneralization of failure experiences to future situations (Slavny et al., 2019).

Present bias, a cognitive bias that reflects attention to immediate reward consequences rather than delayed aversive consequences of possible risky actions, is also common among adolescents (Steinberg, 2008).

Social Influences and Norms (Question 3)

Peer Influence

In early adolescence, youth become increasingly oriented toward peers and dependent on peers' evaluations of them, especially peers who engage in daring and sensational behaviors. Their decision making is adversely affected in the presence of peers and may be described as driven by affect (Romer et al., 2011). Another contributing factor to this heightened peer-influence process is that parents generally engage in less monitoring and control as their children age, thus allowing adolescents increased exposure to risky contexts (Defoe et al., 2019). Under conditions of external constraint, adolescents do not show more risk taking than children. What is emerging is an integrated conception of the ecology of adolescent decision making that includes declining adult constraints and increasing peer exposure.

Adolescents are particularly sensitive to social rewards, and especially to the rewards of socializing with peers, which results in a heightened need to affiliate with agemates and to act in ways that garner the admiration of their friends (Blakemore, 2018). They are influenced by their closest friends (Allen et al., 2012), broader friendship groups (Ellis & Zarbatany, 2007), romantic partners (Simon et al., 2008), popular peers (Helms et al., 2014), online peers (Nesi et al., 2017), and also by unfamiliar idealized (e.g., famous, high visibility) peers (Gerrard et al., 2008). Given that social modeling also promotes social acceptance, adolescents who desire acceptance from peers may adopt the behaviors of those peers to be liked or accepted (Liu et al., 2017; Robinson et al., 2016).

Among adolescents, as compared to adults, attention from peers is associated with stronger neural responses in regions associated with social rewards (Chein et al., 2011; van Hoorn et al., 2018; Albert et al., 2013). More specifically, neural processing research indicates that the presence of peers increases brain reward activation during adolescence, as determined by fMRI-measured brain activity (Chein et al., 2011) - activity which is not localized to a single brain region but instead reflects more general activation (Sherman et al., 2018).

Similar socialization processes may be remarkably powerful determinants of behavior among emerging adults, although perhaps not quite as strongly as in the early and mid-teenage years (Steinberg & Monahan, 2007). Conformity among older adolescents and young adults appears to increase due to high levels of exposure to online content where social norms and indicators of peers' status/popularity are made explicit (Nesi et al., 2018).

Research suggests that individuals adopt the behavior of others when unsure of the appropriate course of action and/or when they hope doing so will result in acceptance. Both adolescents and adults are influenced by the choices they publicly observe others to make (Pettifor et al., 2017), especially in ambiguous contexts and when they lack certainty (Cruwys et al., 2015; Robinson et al., 2014).

Social Norms

A significant body of research has demonstrated the important influence of peers on social norms. Research suggests that both descriptive norms (i.e., how most people actually behave) and injunctive norms (i.e., standards that indicate how people should act, feel, and think in a given situation) affect youth behavior.

Descriptive Norms

Interventions that incorporate social norms show more behavior change when an individual perceives that a greater percentage of others are engaged in a particular behavior. Adolescents often overestimate how often peers engage in risk taking; therefore, informing them about lower norms can influence behavior. For example, undergraduate students, who perceive that a greater number of other students engage in heavy alcohol consumption, consume more alcohol than those who perceive a lower percentage of others engage in heavy alcohol use (DiBello et al., 2018; Larimer et al., 2020). Importantly, a recent meta-analysis (Prestwich et al., 2016) showed that interventions designed to reduce descriptive norms around alcohol use were effective in changing those norms, and that reductions in perceptions of normative use led to statistically significant reductions in alcohol intake, although effect sizes were generally small.

Some interventions that consider the referent group (e.g., whether beliefs about the behavior or attitude of close friends vs. school peers should be highlighted) have been shown to be effective, although which referents are more influential may depend on the specific behavior and other contextual factors (Lewis & Neighbors, 2006; Priebe & Spink, 2015). For example, a meta-analysis that tested the effects of norms on sexual behavior reported that the sexual behavior of close friends (i.e., proximal referent) had a stronger effect on adolescent sexual activity (e.g., initiation, frequency) than the behavior of less proximal, distal referents, such as unspecified school peers (van de Bongardt et al., 2015).

Injunctive Norms

Research focusing on behavior change as a result of injunctive norms is more limited. Favorable injunctive norms refer to perceptions that others accept or approve of an attitude or behavior. A meta-analysis testing effects of norms on sexual behavior found that more favorable injunctive norms were associated with higher levels of adolescent sexual risk activity (van de Bongardt et al., 2015). However, effects of different referent groups could not be tested in this study because the number of relevant studies was insufficient.

Key Sources of Influence (Question 4)

Adolescents are clearly influenced by both peers and adults. With respect to peer influence, young adolescents increased their assessment of risk after learning that other teenagers rated a situation as risky (Knoll et al., 2015). Furthermore, witnessing rule-breaking behaviors, if reinforced by positive peer reactions, such as laughter, has been shown to lead to more rule-breaking up to two years later (Dishion et al., 1996).

Research has indicated a strong influence of adults on adolescents' substance use behavior, sexual-risk behavior (Widman et al., 2016), and health promotion or preventive behaviors (e.g., safe driving, use of sunscreen; Carter et al., 2014; Morris et al., 1998). However, interventions where adult authority figures attempt to convey risk information can sometimes be met with suspicion and derision, and ironically promote risky behavior out of rebellion (Prentice, 2008).

Protective Role of Self-Efficacy (Question 5)

Self-efficacy is specific to engaging in particular behaviors, as contrasted with global self-confidence. It has been defined as one's belief in one's capability to organize and carry out a course of action required to achieve a given outcome (Bandura, 1989). Self-efficacy is potentially an important factor in COVID-19 prevention, given research that self-efficacy is associated with myriad risk and health behaviors, including substance use (Gwaltney et al., 2009; Cooke et al., 2016; Choi et al., 2013; Minnix et al., 2011; Zullig et al., 2014; Epstein et al., 2000b, 2000a), diet and exercise (Ashford et al., 2010), carrying a weapon at school (Valois et al., 2017), and chronic illness management (Slovinec et al., 2014). Both individual self-efficacy and collective efficacy (i.e., perceived ability to act effectively as a group) have been positively associated with risk-prevention behaviors in several studies (Jackson et al., 2016; Ohmer, 2016; Tsang et al., 2012). More recently, self-efficacy and collective efficacy were shown to influence coping behaviors related to preventing the spread of COVID-19 in Spain (Tabernero et al., 2020).

Support for targeting self-efficacy as an intervention strategy derives from several randomized controlled trials showing that, among adolescent populations, life skills training and cognitive behavioral therapy are effective strategies for building on self-efficacy to achieve abstinence from substance abuse (Botvin & Kantor, 2000; Burleson & Kaminer, 2005). Not surprisingly, some investigators have argued that self-efficacy and collective efficacy promotion strategies should be tailored to age, gender, and culture (Tsang et al., 2012).

For youth, the relationship between self-efficacy and health behaviors is moderated by social norms and emotions sparked by social interactions (Kasan et al., 1992; Reyna & Farley, 2006; Albert et al., 2013). For example, youth may believe wearing masks will protect them from COVID-19 and may be confident they can generally keep a mask on, but they may be less confident that they can wear a mask when their peers refuse to wear masks. Thus, the negative consequences of immediate peer rejection may outweigh the benefits of mask wearing (Reyna & Farley, 2006).

Relatedly, it is imperative to consider self-efficacy in the context of emotions and health risk communications. Risk messages that invoke fear without addressing efficacious action may catalyze avoidance-based emotion regulation behaviors. In the context of COVID-19, this may translate to rejecting mask and social distancing recommendations. However, risk messages that invoke fear while increasing behavioral efficacy can produce strong behavioral changes (Witte & Allen, 2000). In this regard, while it is important to honestly relay the severity of COVID-19 infection, it is just as important to

provide information about how to protect oneself and increase confidence that those actions can be performed and that they work.

In summary, the growing evidence base suggests important roles for self-efficacy and collective efficacy for preventing risk taking behaviors in both adolescents and young adults. Tailored approaches to targeting self-efficacy and collective efficacy will be important to take into account in addition to universal prevention strategies employed at a population level (Milstein & Halpern-Felsher, 2002; Song et al., 2009; Warner & Schwarzer, 2020).

Key Environmental Factors Important to Consider When Targeting Youth (Question 6)

Environmental factors that affect youth decision-making are largely age dependent because developmental changes for youth are dynamic and varied. The most important environmental factors for early adolescents are parents (Nash et al., 2005; Viner et al., 2012), peer groups (Albert et al., 2013; Viner et al., 2012), and school (McNeely et al., 2002; Viner et al., 2012). The most important factors for young adults, many of whom are still living at home or on a college campus, are social networks, campus leadership, and school policies (Arnett, 2000).

Adolescents consistently report that the vast majority of their social interactions are electronically mediated (Nesi et al., 2018). Across racial/ethnic and socioeconomic status groups, as well as across all industrialized nations, adolescents spend a remarkably high proportion of their time engaged with digital media, often accessing multiple platforms simultaneously (Anderson & Jiang, 2018). It is thus important to consider peer interactions within social media outlets and online social activities (Huang et al., 2014; Villanti et al., 2017). Indeed, adolescents and young adults are more likely to receive information, and perhaps to be influenced by new ideas and attitudes, on digital media as compared to print media, email, or TV. Emerging literature suggests that online social peer networks are major sources of health information – as well as misinformation -- and significantly impact youth health risk behaviors (Yonker et al., 2015).

Adolescents may be persuaded by social media “influencers” (Nesi et al., 2018) and more willing to attend to information (i.e., an intervention “multiplier effect”) if messaging includes visual cues (Moreno & D’Angelo, 2019). Adolescents will also be more likely to share posts if the tone and content is perceived to be attuned to adolescent norms and may generate more followers or “likes” (Sherman et al., 2016). Thus, prevention and intervention approaches should make use of contemporary digital contexts, messaging, language, and opportunities to “go viral.” Across age, social media that contain a gist message are more influential than those with stories or images that do not convey gist (Catowski et al., 2016).

Although there is little research on college students and COVID-19, research on college binge drinking suggests that alcohol consumption on campus is significantly related to policies and laws. In particular, policies that control prices, limit access, and provide safer environments (e.g., substance free alternatives) are effective in reducing young adult binge drinking and its negative sequelae (Weitzman et al., 2003). Thus, consistent and strong local policies are important contextual factors that may directly increase young adults’ compliance with COVID-19 guidelines that reduce health risks for themselves and their communities.

Behavioral Interventions Shown to Influence Risk Behaviors of Youth (Question 7)

To reduce COVID-19 risk, it is necessary to delineate the predictors and drivers of risky COVID exposure. In this context, it is important to understand the positive motivations for youth to engage in risk behaviors, such as not wearing face coverings and congregating in large groups for parties. Susceptibility to social pressures—not wanting to deviate from the “norm” or look funny with a face covering, implies that preventive interventions should focus on establishing new social norms in the peer group (e.g., not wearing a face covering already violates social norms in some cultures). Another factor may simply be wanting the in-person company of peers, suggesting that other opportunities to socialize, primarily on-line, should be promoted.

Preventive interventions to reduce youth risk behaviors typically occur either in schools or with families. The focus of school-based interventions often is on education about risks of specific behaviors, development of social-emotional competencies and life skills, and related efforts to build positive supports (e.g., through mentoring and school supports; Durlak et al., 2011). Programs such as Life Skills Training (Botvin et al., 1995) and other competency-building approaches have had some success in reducing risk behaviors. The focus of family-based interventions tends to be broad, including promoting healthy parent-child relationships, increasing parental monitoring, and helping parents access resources. Several popular programs, including Strengthening Families (Spath et al., 2004) and Family Matters (Bauman et al., 2002), have found effects on risk behavior outcomes, particularly multiple types of substance use.

Education is a necessary, but not sufficient, component of effective interventions to reduce unhealthy risk taking. Because youth are less likely to become seriously ill, warning of the dire consequences of catching COVID-19 for youth may not be effective. Social-cognitive approaches that also incorporate practicing skills, such as decision-making and role-playing resistance to peer influences, have shown some effectiveness (Griffin et al., 2006; Kirby et al., 2007). Crucially, instruction is more effective when it conveys the gist of the facts (Reyna & Mills, 2014). Interventions that primarily focus on providing descriptions of risk probabilities and outcomes -- without explaining how these connect to background knowledge, mental models, and cultural values -- are likely to be less effective (Downs et al., 2004; Jemmott III et al., 2010).

Two alternative approaches have shown significant promise during adolescence. The first, the mindset approach, leverages adolescents’ beliefs and in particular targets what particular behaviors mean for them and their identities (Crum & Zuckerman, 2017; Yeager et al., 2019). For example, one intervention (Bryan et al., 2019) promoted adolescent healthy eating behavior by reframing healthy eating as a way to fight back against the unjust marketing practices of predatory food companies. The second successful approach focuses on shifting interactions with peers or adults, with an aim to change the climate that they inhabit in terms of what peers value (Paluck et al., 2016) or how respectfully adults treat young people (Okonofua et al., 2016; Yeager et al., 2014).

However, it has long been recognized that structural interventions, such as national social marketing campaigns for HIV/AIDS prevention decades ago in Switzerland (DuBois et al., 1999) and in Uganda (Green et al., 2016) and policy changes (e.g., smoking reduction through a cigarette tax in the United States) can have an impact on youth behavior. For example, providing free access to condoms and testing for HIV and sexually transmitted diseases led to significant reductions in sexually-transmitted diseases. Structural interventions (e.g., free masks at entrance to classrooms, desks spaced apart) may offer a practical and effective way to promote (or facilitate) mask wearing and physical distancing

among youth and young adults. However, failing to change the processes of risky decision-making can produce short-lived effects when environmental affordances or constraints are removed (Reyna, 2020).

Key Considerations When Designing Strategies for Youth (Question 8)

Adolescence is a dynamic period of learning and change (Casey, 2015; Steinberg, 2014; Telzer, 2016), in which adolescents more readily align their attention, motivation, and behavior with experiences they perceive as respectful and according to their status (see Blakemore & Mills, 2014; Crone & Dahl, 2012). Accordingly, behavioral change efforts, to be effective for young people (as for adults) should:

- Be developed collaboratively with young people to ensure relevance to their goals, resources, and constraints;
- Involve members of their community throughout program development, deployment, evaluation, and reporting;
- Be tested before launch to ensure that their content and tone are effective, respectful, and interpreted as intended by young people; and
- Empower participants to make sound, individual decisions.

To be effective, COVID-19 prevention programs might also aim to mobilize communities of young people and allow and encourage them to make meaningful contributions (cf. Fuligni, 2020). In the design of such programs, it is critical to think of young people -- not in terms of the problems that they may cause through their behavior -- but rather in terms of their aspirations, need for experimentation and affiliation, sense of agency, and willingness, even eagerness, to be elements of positive social change (Fischhoff, 2008).

For young people, in particular, a COVID-19 prevention strategy likely to be effective would incorporate all of the factors supported by psychological evidence, as discussed above. These factors include creating peer role models for responsible behaviors, primarily through social media, influencers, and other sources of information. A large-scale social media campaign with peer influencers engaging in responsible COVID-19 preventive behaviors (thereby altering descriptive social norms), coupled with positive peer reactions, could be a highly effective strategy. Peer-to-peer communication and messaging is most likely to be effective, factoring in that young people obtain most of their information and exposure to peers electronically, which has been heightened in the midst of the threat of COVID-19.

Effective prevention programs also create opportunities for the active engagement of youth and young adults with a clear rationale for why they should engage in the healthy behavior (Yeager & Walton, 2011). Factoring in the importance of promoting accurate perceptions of risks and benefits, mature thinking about the gist of risks, and self-efficacy, while recognizing needs for autonomy, status, and respect, offers significant promise for the design of effective programs to promote healthy behaviors for youth and young adults to reduce the transmission of COVID-19.

Appendix

Recognition of Contributing Psychologist Experts

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References

- Albert, D., Chein, J., & Steinberg, L. (2013). The teenage brain: Peer influences on adolescent decision making. *Current Directions in Psychological Science*, 22(2), 114-120.
<https://psycnet.apa.org/doi/10.1177/0963721412471347>
- Allen, J. P., Chango, J., Szwedo, D., Schad, M., & Marston, E. (2012). Predictors of susceptibility to peer influence regarding substance use in adolescence. *Child Development*, 83(1), 337-350.
<https://psycnet.apa.org/doi/10.1111/j.1467-8624.2011.01682.x>
- Anderson, M., & Jiang, J. (2018). Teens, Social Media & Technology 2018. Pew Research Center, May 31, 2018. <https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/>
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, 55(5), 469-480. <https://psycnet.apa.org/doi/10.1037/0003-066X.55.5.469>
- Ashford, S., Edmunds, J., & French, D. P. (2010). What is the best way to change self-efficacy to promote lifestyle and recreational physical activity? A systematic review with meta-analysis. *British Journal of Health Psychology*, 15(2), 265-88. <https://doi.org/10.1348/135910709X461752>
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44(9), 1175.
<https://psycnet.apa.org/doi/10.1037/0003-066X.44.9.1175>
- Bauman K. E., Ennett, S. T., Foshee, V. A., Pemberton, M., King, T. S., & Koch, G. G. (2002). Influence of a family program on adolescent smoking and drinking prevalence. *Prevention Science*, 3(1), 35–42. <https://psycnet.apa.org/doi/10.1023/A:1014619325968>
- Blakemore, S.-J., & Mills, K. L. (2014). Is adolescence a sensitive period for sociocultural processing? *Annual Review of Psychology*, 65, 187–207. <https://doi.org/10.1146/annurev-psych-010213-115202>
- Blakemore S.-J. (2018). Avoiding social risk in adolescence. *Current Directions in Psychological Science*, 27(2), 116-122. <https://psycnet.apa.org/doi/10.1177/0963721417738144>
- Botvin, G. J., Schinke, S. P., Epstein, J. A., Diaz, T., & Botvin, E. M. (1995). Effectiveness of culturally focused and generic skills training approaches to alcohol and drug abuse prevention among minority adolescents: Two-year follow-up results. *Psychology of Addictive Behaviors*, 9(3), 183–194. <https://doi.org/10.1037/0893-164X.9.3.183>
- Botvin, G. J., & Kantor, L. W. (2000). Preventing alcohol and tobacco use through life skills training. *Alcohol Research & Health: The Journal of the National Institute on Alcohol Abuse and Alcoholism*.
- Broniatowski, D. A., Hilyard, K., & Dredze, M. (2016). Effective vaccine communication during the Disneyland measles outbreak. *Vaccine*, 34(28), 3225-8.
<https://doi.org/10.1016/j.vaccine.2016.04.044>
- Bruine de Bruin, W., Parker, A., & Fischhoff, B. (2007). Can Adolescents Predict Significant Events Life Events? *Journal of Adolescent Health*, 41, 208-210.
<https://doi.org/10.1016/j.jadohealth.2007.03.014>
- Bruine de Bruin, W., Parker, A. M., & Fischhoff, B. (2010). Explaining adult age differences in decision-making competence. *Journal of Behavioral Decision Making*, 23, 1-14.
<https://doi.org/10.1002/bdm.712>
- Bryan, C. J., Yeager, D. S., & Hinojosa, C. P. (2019). A values-alignment intervention protects adolescents from the effects of food marketing. *Nature Human Behaviour*, 3(6), 596–603.
<https://doi.org/10.1038/s41562-019-0586-6>

- Carter, P. M., Bingham, C. R., Zakrajsek, J. S., Shope, J. T., & Sayer, T. B. (2014). Social norms and risk perception: Predictors of distracted driving behavior among novice adolescent drivers. *Journal of Adolescent Health, 54*(5), S32-S41.
<https://psycnet.apa.org/doi/10.1016/j.jadohealth.2014.01.008>
- Casey, B. J. (2015). Beyond simple models of self-control to circuit-based accounts of adolescent behavior. *Annual Review of Psychology, 66*, 295–319.
<https://psycnet.apa.org/doi/10.1146/annurev-psych-010814-015156>
- Cauffman, E., Shulman, E., Steinberg, L., Claus, E., Banich, M., Woolard, J., & Graham, S. (2010). Age differences in sensitivity to the rewards and costs of a risky decision as indexed by performance on the Iowa gambling task. *Developmental Psychology, 46*, 193-207.
<https://doi.org/10.1037/a0016128>
- Chein, J., Albert, D., O'Brien, L., Uckert, K. & Steinberg, L. (2011). Peers increase adolescent risk taking by enhancing activity in the brain's reward circuitry. *Developmental Science, 14*(2), F1-F10.
<https://psycnet.apa.org/doi/10.1111/j.1467-7687.2010.01035.x>
- Choi, H. J., Krieger, J. L., & Hecht, M. L. (2013). Reconceptualizing efficacy in substance use prevention research: Refusal response efficacy and drug resistance self-efficacy in adolescent substance use. *Health Communication, 28*(1), 40-52.
<https://doi.org/10.1080/10410236.2012.720245>
- Cooke, R., Dahdah, M., Norman, P., & French, D. P. (2016). How well does the theory of planned behaviour predict alcohol consumption? A systematic review and meta-analysis. *Health Psychology Review, 10*(2), 148-167.
<https://psycnet.apa.org/doi/10.1080/17437199.2014.947547>
- Crone, E. A., & Dahl, R. E. (2012). Understanding adolescence as a period of social-affective engagement and goal flexibility. *Nature Reviews Neuroscience, 13*, 636–650.
<https://doi.org/10.1038/nrn3313>
- Crone, E. A., & Steinbeis, N. (2017). Neural perspectives on cognitive control development during childhood and adolescence. *Trends in Cognitive Sciences, 21*, 205–215.
<https://psycnet.apa.org/doi/10.1016/j.tics.2017.01.003>
- Crum, A., & Zuckerman, B. (2017). Changing Mindsets to Enhance Treatment Effectiveness. *JAMA, 317*(20), 2063.
<https://doi.org/10.1001/jama.2017.4545>
- Cruwys, T., Bevelander, K. E., & Hermans, R. C. J. (2015). Social modeling of eating: A review of when and why social influence affects food intake and choice. *Appetite, 86*, 3-18.
<https://psycnet.apa.org/doi/10.1016/j.appet.2014.08.035>
- de Water, E., Cillessen, A. H. N. & Scheres, A. (2014), Distinct age-related differences in temporal discounting and risk taking in adolescents and young adults. *Child Development, 85*, 1881-1897.
<https://doi:10.1111/cdev.12245>
- Defoe, I. N., Dubas, J. S., & Romer, D. (2019). Heightened adolescent risk-taking? Insights from lab studies on age differences in decision-making. *Policy Insights from the Brain and Behavioral Sciences, 6*(1), 56-63. <https://psycnet.apa.org/doi/10.1177/2372732218801037>
- DiBello, A. M., Miller, M. B., Neighbors, C., Reid, A., & Carey, K. B. (2018). The relative strength of attitudes versus perceived drinking norms as predictors of alcohol use. *Addictive Behaviors, 80*, 39-46. <https://psycnet.apa.org/doi/10.1016/j.addbeh.2017.12.022>
- Dishion, T. J., Spracklen, K. M., Andrews, D. W., & Patterson, G. R. (1996). *Deviancy training in male adolescent friendships. Behavior Therapy, 27*(3), 373-390. [https://doi.org/10.1016/S0005-7894\(96\)80023-2](https://doi.org/10.1016/S0005-7894(96)80023-2)

- Downs, J. S., Murray, P. J., Bruine de Bruin, W., Penrose, J., Palmgren, C., & Fischhoff, B. (2004). Interactive video behavioral intervention to reduce adolescent females' STD risk: A randomized controlled trial. *Social Science & Medicine*, 59, 1561–1572.
<https://doi.org/10.1016/j.socscimed.2004.01.032>
- Dubois-Archer, F., Jeannin, A., Spencer, B. (1999). Long term global evaluation of a national AIDS prevention strategy: the case of Switzerland. *AIDS*, 13(18), 2571-2582.
<https://doi.org/10.1097/00002030-199912240-00011>
- Ellis, W. E., & Zarbatany, L. (2007). Peer group status as a moderator of group influence on children's deviant, aggressive, and prosocial behavior. *Child Development*, 78(4), 1240–1254.
<https://doi.org/10.1111/j.1467-8624.2007.01063.x>
- Epstein, J. A., Griffin, K. W., & Botvin, G. J. (2000a). Competence skills help deter smoking among inner city adolescents. *Tobacco Control*, 9(1), 33-9. <https://doi.org/10.1136/tc.9.1.33>
- Epstein, J. A., Griffin, K. W., & Botvin, G. J. (2000b). Role of general and specific competence skills in protecting inner-city adolescents from alcohol use. *Journal of Studies on Alcohol*, 61(3), 379–386. <https://doi.org/10.15288/jsa.2000.61.379>
- Fischhoff, B., Parker, A., Bruine de Bruin, W., Downs, J., Palmgren, C., Dawes, R. M., & Manski, C. (2000). Teen expectations for significant life events. *Public Opinion Quarterly*, 64, 189-205.
<http://dx.doi.org/10.1086/317762>
- Fischhoff, B. (2008). Assessing adolescent decision-making competence. *Developmental Review*, 28(1), 12-28. <http://dx.doi.org/10.1016/j.dr.2007.08.001>
- Fischhoff, B., & Broomell, S. B. (2020). Judgment and decision making. *Annual Review of Psychology*, 71, 331-355. <https://psycnet.apa.org/doi/10.1146/annurev-psych-010419-050747>
- Fuligni, A. L. (2020). Is there inequality in what adolescents can give as well as receive? *Current Directions in Psychological Science*, 29(4), 405-411.
<https://psycnet.apa.org/doi/10.1177/0963721420917738>
- Galván, A. (2013). The Teenage Brain: Sensitivity to Rewards. *Current Directions in Psychological Science*, 22(2), 88-93. <https://psycnet.apa.org/doi/10.1177/0963721413480859>
- Gerrard, M., Gibbons, F. X., Houlihan, A. E., Stock, M. L., & Pomery, E. A. (2008). A dual-process approach to health risk decision making: The prototype willingness model. *Developmental Review*, 28(1), 29-61. <https://psycnet.apa.org/doi/10.1016/j.dr.2007.10.001>
- Green E. C., Halperin D. T., Nantulya, V., & Hogle, J. A. (2006). Uganda's HIV Prevention Success: The Role of Sexual Behavior Change and the National Response. *AIDS and Behavior*, 10(4), 335–346. <https://doi.org/10.1007/s10461-006-9073-y>
- Griffin, K. W., Botvin, G. J., & Nichols, T. R. (2006). Effects of a school-based drug abuse prevention program for adolescents on HIV risk behaviors in young adulthood. *Prevention Science*, 7(1), 103–112. <https://doi.org/10.1007/s11121-006-0025-6>
- Gwaltney, C. J., Metrik, J., Kahler, C. W., & Shiffman, S. (2009). Self-efficacy and smoking cessation: a meta-analysis. *Psychology of Addictive Behaviors*, 23(1), 56-66.
<https://doi.org/10.1037/a0013529>
- Helms, S. W., Choukas-Bradley, S., Widman, L., Giletta, M., Cohen, G. L., & Prinstein, M. J. (2014). Adolescents misperceive and are influenced by high-status peers' health risk, deviant, and adaptive behavior. *Developmental Psychology*, 50(12), 2697-2714.
<https://doi.org/10.1037/a0038178>
- Huang, G. C., Unger, J. B., Soto, D., Fujimoto, K., Pentz, M. A., Jordan-Marsh, M., & Valente, T. W. (2014). Peer influences: the impact of online and offline friendship networks on adolescent smoking and alcohol use. *Journal of Adolescent Health*, 54(5), 508-514.
<https://doi.org/10.1016/j.jadohealth.2013.07.001>

- Icenogle, G., Steinberg, L., Duell, N., Chein, J., Chang, L., Chaudhary, N., . . . Bacchini, D. (2019). Adolescents' cognitive capacity reaches adult levels prior to their psychosocial maturity: Evidence for a "maturity gap" in a multinational sample. *Law and Human Behavior*, 43(1), 69-85. <https://doi.org/10.1037/lhb0000315>
- Jackson, N., Denny, S., Sheridan, J., Zhao, J., & Ameratunga, S. (2016). The role of neighborhood disadvantage, physical disorder, and collective efficacy in adolescent alcohol use: a multilevel path analysis. *Health Place*, 41, 24-33. <https://doi.org/10.1016/j.healthplace.2016.07.005>
- Jemmott, J. B., Jemmott, L. S., & Fong, G. T. (2010). Efficacy of a theory-based abstinence-only intervention of over 24 months: A randomized controlled trial with young adolescents. *Archives of Pediatrics & Adolescent Medicine*, 164(2), 152-159. <https://doi.org/10.1001/archpediatrics.2009.267>
- Kirby, D. B., Laris, B. A., & Roller, L. A. (2007). Sex and HIV education programs: Their impact on sexual behaviors of young people throughout the world. *Journal of Adolescent Health*, 40(3), 206-217. <https://doi.org/10.1016/j.jadohealth.2006.11.143>
- Knoll, L. J., Magis-Weinberg, L., Speekenbrink, M., & Blakemore, S.-J. (2015). Social influence on risk perception during adolescence. *Psychological Science*, 26(5), 583-592. <https://doi.org/10.1177/0956797615569578>
- Lapsley, D. K., & Hill, P. L. (2010). Subjective invulnerability, optimism bias and adjustment in emerging adulthood. *Journal of Youth and Adolescence*, 39(8), 847-57. <https://doi.org/10.1007/s10964-009-9409-9>
- Larimer, M. E., Parker, M., Lostutter, T., Rhew, I., Eakins, D., Lynch, A., Walter, T., Egashira, L., Kipp, B. J., & Duran, B. (2020). Perceived descriptive norms for alcohol use among tribal college students: Relation to self-reported alcohol use, consequences, and risk for alcohol use disorder. *Addictive Behaviors*, 102, Article 106158. <https://doi.org/10.1016/j.addbeh.2019.106158>
- Lewis, M. A., & Neighbors, C. (2006). Social norms approaches using descriptive drinking norms education: A review of the research on personalized normative feedback. *Journal of American College Health*, 54, 213-218. <https://psycnet.apa.org/doi/10.3200/JACH.54.4.213-218>
- Liu, J., Zhao, S., Chen, X., Falk, E., & Albarracín, D. (2017). The influence of peer behavior as a function of social and cultural closeness: meta-analysis of normative influence on adolescent smoking initiation and continuation. *Psychological Bulletin*, 143(10), 1082-1115. <https://psycnet.apa.org/doi/10.1037/bul0000113>
- Lloyd, A., McKay, R., Sebastian, C. & Balsters, J. (2020). Are adolescents more optimal decision-makers in novel environments? Examining the benefits of heightened exploration in a patch foraging paradigm. *Developmental Science*, Article e13075. Advance online publication. <https://doi.org/10.1111/desc.13075>
- McNeely, C. A., Nonnemaker, J. M., & Blum, R. W. (2002). Promoting school connectedness: Evidence from the national longitudinal study of adolescent health. *Journal of School Health*, 72(4), 138-146. <https://doi.org/10.1111/j.1746-1561.2002.tb06533.x>
- Minnix, J. A., Blalock, J. A., Marani, S., Prokhorov, A. V., & Cinciripini, P. M. (2011). Self-efficacy mediates the effect of depression on smoking susceptibility in adolescents. *Nicotine and Tobacco Research*, 13(8), 699-705. <https://doi.org/10.1093/ntr/ntr061>
- Moreno, M. A., & D'Angelo, J. (2019). Social media intervention design: applying an affordances framework. *Journal of Medical Internet Research*, 21(3), Article e11014. <https://doi.org/10.2196/11014>
- Morris, J., McGee, R., & Bandaranayake, M. (1998). Sun protection behaviours and the predictors of sunburn in young children. *Journal of Pediatrics and Child Health*, 34(6), 557-562. <https://doi.org/10.1046/j.1440-1754.1998.00307.x>

- Moutsiana, C., Garrett, N., Clarke, R. C., Lotto, R. B., Blakemore, S. J. & Sharot, T. (2013). Human development of the ability to learn from bad news. *PNAS Proceedings of the National Academy of Sciences*, 110(41), 16396–16401. <https://psycnet.apa.org/doi/10.1073/pnas.1305631110>
- Nash, S. G., McQueen, A., & Bray, J. H. (2005). Pathways to adolescent alcohol use: Family environment, peer influence, and parental expectations. *Journal of Adolescent Health*, 37(1), 19–28. <https://psycnet.apa.org/doi/10.1016/j.jadohealth.2004.06.004>
- Nesi, J., Rothenberg, W. A., Hussong, A. M., & Jackson, K. M. (2017). Friends' alcohol-related social networking site activity predicts escalations in adolescent drinking: mediation by peer norms. *Journal of Adolescent Health*, 60(6), 641–647. <https://doi.org/10.1016/j.jadohealth.2017.01.009>
- Nesi, J., Choukas-Bradley, S., & Prinstein, M. J. (2018). Transformation of adolescent peer relations in the social media context: Part 1-A theoretical framework and application to dyadic peer relationships. *Clinical Child and Family Psychology Review*, 21(3), 267–294. <https://doi.org/10.1007/s10567-018-0261-x>
- Ohmer, M. L. (2016). Strategies for preventing youth violence: Facilitating collective efficacy among youth and adults. *Journal of the Society for Social Work and Research*. 7(4), 681–705. <https://psycnet.apa.org/doi/10.1086/689407>
- Okonofua, J. A., Paunesku, D., & Walton, G. M. (2016). Brief intervention to encourage empathic discipline cuts suspension rates in half among adolescents. *PNAS Proceedings of the National Academy of Sciences*, 113(19), 5221–5226. <https://doi.org/10.1073/pnas.1523698113>
- Paluck, E. L., Shepherd, H., & Aronow, P. M. (2016). Changing climates of conflict: A social network experiment in 56 schools. *PNAS Proceedings of the National Academy of Sciences*, 113(3), 566–571. <https://doi.org/10.1073/pnas.1514483113>
- Parker, A. M., Bruine de Bruin, W., Fischhoff, B., & Weller, J. (2018). Robustness of decision-making competence: Evidence from two measures and an 11-year longitudinal study. *Journal of Behavioral Decision Making*, 31(3), 380–391. <https://psycnet.apa.org/doi/10.1002/bdm.2059>
- Pettifor, H., Wilson, C., Axsen, J., Abrahamse, W., & Anable, J. (2017). Social influence in the global diffusion of alternative fuel vehicles - A meta-analysis. *Journal of Transport Geography*, 62, 247–261. <https://doi.org/10.1016/j.jtrangeo.2017.06.009>
- Prentice, D. A. (2008). Mobilizing and weakening peer influence as mechanisms for changing behavior: Implications for alcohol intervention programs. In M. J. Prinstein & K. A. Dodge (Eds.), *Understanding peer influence in children and adolescents* (pp. 161–180). New York: Guilford.
- Prestwich, A., Kellar, I., Conner, M., Lawton, R., Gardner, P. & Turgut, L. (2016). Does changing social influence engender changes in alcohol intake? A meta-analysis. *Journal of Consulting and Clinical Psychology*, 84(10), 845–860. <https://psycnet.apa.org/doi/10.1037/ccp0000112>
- Priebe, C. S., & Spink, K. S. (2017). Less sitting and more moving in the office: Using descriptive norm messages to decrease sedentary behavior and increase light physical activity at work. *Psychology of Sport and Exercise*, 19, 76–84. <https://psycnet.apa.org/doi/10.1016/j.psychsport.2015.02.008>
- Quadrel, M. J., Fischhoff, B., & Davis, W. (1993). Adolescent (in)vulnerability. *American Psychologist*, 48(2), 102–116. <https://doi.org/10.1037/0003-066X.48.2.102>
- Reyna, V. F., & Farley, F. (2006). Risk and Rationality in Adolescent Decision Making: Implications for Theory, Practice, and Public Policy. *Psychological Science in the Public Interest*, 7(1), 1–44. <https://doi.org/10.1111/j.1529-1006.2006.00026.x>
- Reyna, V. F., Estrada, S. M., DeMarinis, J. A., Myers, R. M., Stanis, J. M., & Mills, B. A. (2011). Neurobiological and memory models of risky decision making in adolescents versus young adults. *Journal of Experimental Psychology: Learning Memory and Cognition*, 37(5), 1125–1142. <https://psycnet.apa.org/doi/10.1037/a0023943>

- Reyna, V. F., Croom, K., Staiano-Coico, L., Lesser, M. L., Lewis, D., Frank, J., & Marchell, T. (2013). Endorsement of a personal responsibility to adhere to the minimum drinking age law predicts consumption, risky behaviors, and alcohol-related harms. *Psychology, Public Policy, and Law*, 19, 380–394. <https://psycnet.apa.org/doi/10.1037/a0032538>
- Reyna, V. F., & Mills, B. A. (2014). Theoretically motivated interventions for reducing sexual risk taking in adolescence: A randomized controlled experiment applying fuzzy-trace theory. *Journal of Experimental Psychology: General*, 143(4), 1627–1648. <https://doi.org/10.1037/a0036717>
- Reyna, V. F. (2020). A scientific theory of gist communication and misinformation resistance, with implications for health, education, and policy. *PNAS Proceedings of the National Academy of Sciences*. <https://doi.org/10.1073/pnas.1912441117>
- Robinson, E., Thomas, J., Aveyard, P., & Higgs, S. (2014). What everyone else is eating: A systematic review and meta-analysis of the effect of informational eating norms on eating behavior. *Journal of the Academy of Nutrition and Dietetics*, 114(3), 414–429. <https://doi.org/10.1016/j.jand.2013.11.009>
- Robinson, E., Oldham, M., Sharps, M., Cunliffe, A., Scott, J., Clark, E., Piercy, K. & Field, M. (2016). Social imitation of alcohol consumption and ingratiation motives in young adults. *Psychology of Addictive Behaviors*, 30(4), 442–449. <https://doi.org/10.1037/adb0000150>
- Rodman, A. M., Powers, K. E., & Somerville, L. H. (2017). Development of self-protective biases in response to social evaluative feedback. *PNAS Proceedings of the National Academy of Sciences*. 114(50), 13158–13163. <https://doi.org/10.1073/pnas.1712398114>
- Romer, D., Betancourt, L., Brodsky, N. L., Giannetta, J. M., Yang, W., & Hurt, H. (2011). Does adolescent risk taking imply weak executive function? A prospective study of relations between working performance, impulsivity, and risk taking in early adolescents. *Developmental Science*, 14(5):1119–1133. <https://dx.doi.org/10.1111%2Fj.1467-7687.2011.01061.x>
- Sherman, L. E., Payton, A. A., Hernandez, L. M., Greenfield, P. M., & Dapretto, M. (2016). The power of the like in adolescence: effects of peer influence on neural and behavioral responses to social media. *Psychological Science*, 27(7), 1027–1035. <https://doi.org/10.1177/0956797616645673>
- Sherman, L., Steinberg, L., & Chein, J. (2018). Connecting brain responsivity and real-world risk taking: Strengths and limitations of current methodological approaches. *Developmental Cognitive Neuroscience*, 33, 27–41. <https://doi.org/10.1016/j.dcn.2017.05.007>
- Simon, V. A., Aikins, J. W., & Prinstein, M. J. (2008). Romantic partner selection and socialization during early adolescence. *Child Development*, 79(6), 1676–1692. <https://doi.org/10.1111/j.1467-8624.2008.01218.x>
- Slavny, R. J. M., Sebastian, C. L., & Pote, H. (2019). Age-related changes in cognitive biases during adolescence. *Journal of Adolescence*, 74, 63–70. <https://doi.org/10.1016/j.adolescence.2019.04.007>
- Slovinec D'Angelo, M. E., Pelletier, L. G., Reid, R. D., & Huta, V. (2014). The roles of self-efficacy and motivation in the prediction of short-and long-term adherence to exercise among patients with coronary heart disease. *Health Psychology*, 33(11), 1344–1353. <https://doi.org/10.1037/hea0000094>
- Spoth, R., Redmond, C., Shin, C., & Azevedo, K. (2004). Brief family intervention effects on adolescent substance initiation: school-level growth curve analyses 6 years following baseline. *Journal of Consulting and Clinical Psychology*, 72(3), 535–542. <https://doi.org/10.1037/0022-006x.72.3.535>
- Steinberg, L. (2006). Risk taking in adolescence: New perspectives from brain and behavioral science. *Current Directions in Psychological Science*, 16(2), 55–59. <https://psycnet.apa.org/doi/10.1111/j.1467-8721.2007.00475.x>
- Steinberg, L., & Monahan, K. C. (2007). Age differences in resistance to peer influence. *Developmental Psychology*, 43(6), 1531–1543. <https://psycnet.apa.org/doi/10.1037/0012-1649.43.6.1531>

- Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review*, 28(1), 78-106. <https://psycnet.apa.org/doi/10.1016/j.dr.2007.08.002>
- Steinberg, L., Graham, S., O'Brien, L., Woolard, J., Cauffman, E., & Banich, M. (2009). Age differences in future orientation and delay discounting. *Child Development*, 80(1), 28-44. <https://psycnet.apa.org/doi/10.1111/j.1467-8624.2008.01244.x>
- Steinberg, L. (2014). *Age of opportunity: Lessons from the new science of adolescence*. Houghton Mifflin Harcourt.
- Steinberg, L. (2015). How to improve the health of American adolescents. *Perspectives on Psychological Science*, 10(6), 711-715. <https://psycnet.apa.org/doi/10.1177/1745691615598510>
- Steinberg, L., Icenogle, G., Shulman, E., Breiner, K., Chein, J., Bacchini, D., . . . Takash, H. (2018). Around the world, adolescence is a time of heightened sensation seeking and immature self-regulation. *Developmental Science*, 21(2), 1-13.
- Taberero, C., Castillo-Mayén, R., Luque, B., & Cuadrado, E. (2020). Social values, self- and collective efficacy explaining behaviours in coping with Covid-19: Self-interested consumption and physical distancing in the first 10 days of confinement in Spain. *PLoS ONE*. 15(9) <https://doi.org/10.1371/journal.pone.0238682>
- Telzer, E. H. (2016). Dopaminergic reward sensitivity can promote adolescent health: A new perspective on the mechanism of ventral striatum activation. *Developmental Cognitive Neuroscience*, 17, 57-67. <https://doi.org/10.1016/j.dcn.2015.10.010>
- Tsang, S. K. M., Hui, E. K. P., & Law, B. C. M. (2012). Self-efficacy as a positive youth development construct: A conceptual review. *Scientific World Journal*. <https://doi.org/10.1100/2012/452327>
- Tymula, A., Rosenbreg Belmaker, L. A., Roy, A. K., Ruderman, L., Mason, K., Glimcher, P. W., & Levy, I. (2012). Adolescents' risk-taking behavior is driven by tolerance to ambiguity. *PNAS Proceedings of the National Academy of Sciences*, 109(42), 17135-17140. <https://doi.org/10.1073/pnas.1207144109>
- Valois, R. F., Zullig, K. J., & Revels, A. A. (2017). Aggressive and Violent Behavior and Emotional Self-Efficacy: Is There a Relationship for Adolescents? *Journal of School Health*. 87(4), 269-277. <https://doi.org/10.1111/josh.12493>
- van de Bongardt, D., Reitz, E., Sandfort, T., & Deković, M. (2015). A meta-analysis of the relations between three types of peer norms and adolescent sexual behavior. *Personality and Social Psychology Review*, 19(3), 203-234. <https://doi.org/10.1177/1088868314544223>
- van Hoorn, J., McCormick, E. M., Rogers, C. R., Ivory, S. L., & Telzer, E. H. (2018). Differential effects of parent and peer presence on neural correlates of risk taking in adolescence. *Social Cognitive and Affective Neuroscience*. 13(9), 945-955. <https://doi.org/10.1093/scan/nsy071>
- Villanti, A. C., Johnson, A. L., Ilakkuvan, V., Jacobs, M. A., Graham, A. L., & Rath, J. M. (2017). Social media use and access to digital technology in US young adults in 2016. *Journal of Medical Internet Research*, 19(6), e196. <https://doi.org/10.2196/jmir.7303>
- Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *Lancet*, 379(9826), 1641-1652. [https://doi.org/10.1016/s0140-6736\(12\)60149-4](https://doi.org/10.1016/s0140-6736(12)60149-4)
- Weitzman, E. R., Nelson, T. F., & Wechsler, H. (2003). Taking up binge drinking in college: The influences of person, social group, and environment. *Journal of Adolescent Health*, 32(1), 26-35. [https://doi.org/10.1016/s1054-139x\(02\)00457-3](https://doi.org/10.1016/s1054-139x(02)00457-3)
- White, C. M., Gummerum, M., & Hanoch, Y. (2018). Framing of online risk: Young adults' and adolescents' representations of risky gambles. *Decision*, 5(2), 119-128. <https://doi.org/10.1037/dec0000066>

- Widman, L., Choukas-Bradley, S., Noar, S. M., Nesi, J., & Garrett, K. (2016). Parent-adolescent sexual communication and adolescent safer sex behavior: a meta-analysis. *JAMA Pediatrics*, 170(1), 52-61. <https://doi.org/10.1001/jamapediatrics.2015.2731>
- Witte K, & Allen, M. (2000). A Meta-Analysis of Fear Appeals: Implications for Effective Public Health Campaigns. *Health Education & Behavior*, 27(5)591-615. <https://doi.org/10.1177/109019810002700506>
- Yonker, L. M., Zan, S., Scirica, C. V., Jethwani, K., & Kinane, T. B. (2015). "Friending" teens: systematic review of social media in adolescent and young adult health care. *Journal of Medical Internet Research*, 17(1), e4. <https://doi.org/10.2196/jmir.3692>
- Yeager, D. S., & Walton, G. M. (2011). Social-psychological interventions in education: They're not magic. *Review of Educational Research*, 81(2), 267–301. <https://doi.org/10.3102/0034654311405999>
- Yeager, D. S., Purdie-Vaughns, V., Garcia, J., Apfel, N., Brzustoski, P., Master, A., Hessert, W. T., Williams, M. E., & Cohen, G. L. (2014). Breaking the cycle of mistrust: Wise interventions to provide critical feedback across the racial divide. *Journal of Experimental Psychology: General*, 143(2), 804–824. <https://doi.org/10.1037/a0033906>
- Yeager, D. S., Hanselman, P., Walton, G. M., Murray, J. S., Crosnoe, R., Muller, C., Tipton, E., Schneider, B., Hulleman, C. S., Hinojosa, C. P., Paunesku, D., Romero, C., Flint, K., Roberts, A., Trott, J., Iachan, R., Buontempo, J., Yang, S. M., Carvalho, C. M., ... Dweck, C. S. (2019). A national experiment reveals where a growth mindset improves achievement. *Nature*, 573(7774), 364–369. <https://doi.org/10.1038/s41586-019-1466-y>
- Zullig, K. J., Teoli, D. A., & Valois, R. F. (2014). Emotional self-efficacy and alcohol and tobacco use in adolescents. *Journal of Drug Education*. 44(1-2)51-66. <https://doi.org/10.1177/0047237915573526>