Five Priorities for Future Research on Child and Adolescent Peer Influence

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Abstract

Over the past 50 years, a large body of work has demonstrated that during childhood and adolescence peers are strong socialization agents influencing youth development across a wide array of behavioral domains. In this paper we highlight how this long-standing research focus on peer influence may benefit from undertaking new directions that have been largely neglected in prior work. Specifically, we propose and discuss five main issues that we believe future peer influence studies should aim to address: (1) extending the examination of peer influence to multiple potential sources of socialization, beyond close friends; (2) examining peer influence effects over shorter time frames, and in real time; (3) testing indirect forms of peer influence; (4) extending the conceptualization and measurement of peer influence susceptibility; (5) examining positive and adaptive forms of peer influence. The integration of recent theoretical and methodological advances from other disciplines will allow peer influence researchers to answer these and other exciting questions to better elucidate how and when peers are more likely to influence youth development.

Five Priorities for Future Research on Child and Adolescent Peer Influence

Peer influence processes have been studied for decades, and not just by psychologists. Many disciplines have been interested in understanding whether and how nonfamilial social companions affect one another's interests, attitudes, and behaviors. Indeed, this is a phenomenon that has captured the attention of economists (Grennan, 2019), political scientists (Ferrali, Grossman, Platas, & Rodden, in press), and criminologists (Bayer, Hjalmarsson, & Pozen, 2009; McGloin & Thomas, 2019), and also has influenced educational policy (Dishion, McCord, & Poulin, 1999), marketing (Phua, 2019), and epidemiology (Christakis & Fowler, 2007). However, it may be psychological scientists that have most thoroughly investigated peer influence effects, perhaps especially to understand how peers shape children's and adolescents' developmental trajectories. About a half-century ago, scholars determined that apparent similarities between youth and their peers are likely due to at least two processes: first, a tendency for adolescents to select friends who already possess similar attitudes or behavioral proclivities (i.e., selection effects), and second, processes that lead one or more individuals' attitudes or behaviors to change the attitudes or behavior of another (i.e., socialization effects) (Cohen, 1977; Kandel, 1978). To date, hundreds of investigations have offered empirical support for both types of effects across a variety of different behaviors, and in different populations of youth (Brechwald & Prinstein, 2011; Veenstra et al., 2013; see meta-analysis by Giletta, Choukas-Bradley et al., under review).

Yet, despite decades of research designed to substantiate and establish the strength of these peer influence effects, many fundamental and especially critical issues remain relatively unresolved. Currently, we do not yet fully understand *why* and *when* youth may select or

emulate their peers, we have no established interventions designed to mitigate peer influence effects towards dangerous or harmful behavior (see Prentice, 2008), we do not fully appreciate the extent to which individuals differ in susceptibility to peer influence, and we do not understand whether peer influence towards adaptive versus maladaptive outcomes represent similar or unrelated processes. Indeed, there are many new directions that investigators may pursue to better understand peer influence effects and to leverage them to promote adaptive development. In this paper, we have articulated five issues that we believe deserve urgent attention within the literature (see also Prinstein & Giletta, 2016; 2020). We have labeled each future direction as a hypothesis that has been supported preliminarily within the literature, yet we believe requires greater empirical attention and innovative approaches to address a phenomenon that has implications for a wide array of behavioral sciences.

1. Individuals are Influenced By People Other than Their Close Friends

Youth are engaged in a remarkable number of social interactions each day, not only in-person, but increasingly online as well (Nesi, Choukas-Bradley, & Prinstein, 2018; Twenge et al., 2019). Each of these relationships is a potential source of influence towards the same attitudes and behaviors that have been examined within the peer influence literature (e.g., substance use, externalizing symptoms, health risk behaviors, etc.). Yet perhaps due to methodological challenges, or siloed academic niches, most research in developmental, clinical, and health psychology has restricted the study of peer socialization processes to close friends attending the same school as study participants. This has led to three important limitations. First, the empirical emphasis on the study of close friendships as sources of peer socialization likely has led to a vast underestimate in the extent to which peers influence youths' development.

In addition to close friends, adolescents likely are also influenced within their broader social networks (e.g., Fuijimoto & Valente, 2012), classmates (Busching & Krahé, 2020; Crosnoe, Riegle-Crumb, Field, Frank, & Muller, 2008), romantic partners (Haynie et al., 2005; Simon, Aikins, & Prinstein, 2008), envied or popular peers (Helms, Choukas-Bradley, Widman, Giletta, Cohen, & Prinstein, 2014; Robalino & Macy, 2018; Zhang, Pomerantz, Qin, Logis, Ryan, & Wang, 2019), and perhaps even enemies or undesired peers through processes of anti-conformity (Cohen & Prinstein, 2006; Rambaran et al., 2015). Recent data suggests that adolescents even may be influenced by unfamiliar online social media “friends,” or by a quantified tally of online approval (e.g., “likes”) from unknown online peers (Sherman et al., 2016; Nesi, Rotherberg, Hussong, & Jackson, 2017). The cumulative and relative importance of each of these peer contexts as sources of peer influence sorely needs greater research attention.

Second, it is important to note that peer socialization often occurs with regard to attitudes and behaviors that frequently are also the subject of youths’ discussions among adults, yet few studies recently have examined peer influence processes as compared to adults’ (especially nonparental adults’), or perhaps even siblings’ influence (Spijkerman et al., 2007; Whiteman, Jensen, Mustillo, & Maggs, 2016). This may be an especially important question to address if efforts to alter peer influence effects are to be successful; in other words, it may otherwise be difficult to modify the power of peer socialization without understanding the countervailing forces that also are at play. Indeed, some youth may be equally if not more influenced towards the attitudes or behavior of their parents, teachers, coaches, or community religious leaders. There likely are individual differences between youth in the power of socialization by peers as compared to other interpersonal sources, and also developmental patterns related to critical vulnerable periods in which some sources prove more influential than others (Knoll et al., 2015).

For instance, it has long been assumed that peers are more powerful sources of influence than are adults at the transition to adolescence (Berndt, 1979), but only more recently have neuroscience findings empirically demonstrated developmental differences in neural responses to peer influence in a manner consistent with these past theories (e.g., Chein et al., 2011; Smith, Steinberg, Strang, & Chein, 2015). For instance, recent work has revealed that adolescents have greater neural reactivity in social reward regions (e.g., ventral striatum) to positive peer feedback than do children or adults (Burnett, Sebastian, Cohen, Blakemore, 2011), and that in the context of a risk-taking scenario, adolescents demonstrate greater activation of neural regions associated with social rewards, social cognition, and visual/motor processing in the presence of peers than when in the presence of their parents (van Hoorn, McCormick, Rogers, Ivory, & Telzer, 2018).

A third gap in prior work resulting from a disproportionate focus on only one potential source of peer influence (i.e., close friends) has been a diminished understanding of *how* youth *reconcile* conflicting socialization messages. This may be because it is currently unknown how these “socialization messages” may operate (see a Prinstein & Giletta, 2016 for a review of peer influence mechanisms). In some cases, socialization may occur through explicit pressure, dialogue, or observable reinforcement (e.g., deviancy training; Dishion, Spracklen, Andrersws, & Patterson, 1996), whereas in other cases, messaging may be implicit through social mimicry or emotion contagion (Thorson, West, & Mendes 2018). Notably, socialization messaging also may vary across different modes of peer influence (i.e., adults may model one attitude or behavior while peers explicitly encourage an opposing attitude or behavior). This is an essential process to examine more thoroughly, however, because it may yield important clues to ever-elusive questions regarding why individuals are socialized by others and what strategies may prove most effective to dissuade adolescents’ from emulating their peers’ more dangerous or risk-taking

behaviors. There are numerous possibilities that likely influence adolescents' decision-making processes, yet remarkably few have been studied by developmental scientists, and even fewer have compared competing theories simultaneously. For instance, it may be that the recency of socialization messages proves especially powerful in affecting youths' own behavior, with adolescents' more frequent engagement with peers offering an advantage for this source of influence. Alternatively, others have suggested that the sources of influence likely to exert the most powerful effects are those that symbolize a desired identity, such as high status peers or media celebrities (Berger & Heath, 2008; Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008). Neuroscience research indicates that activation of neural circuits associated with (social) rewards may be stronger in response to peers as compared to adults (Saxe et al., 2015), and this activation in turn predicts conformity to peers (Pei et al., 2020; Telzer, Jorgensen, Prinstein, & Lindquist, in press) suggesting a biological framework for understanding how youth prioritize one socialization source over others. Youths' own individual characteristics (e.g., self-esteem, depression, social anxiety, risk-taking proclivities, autonomy) also may be important factors influencing how adolescents reconcile conflicting messages between adults, peers, or others, perhaps with some youth emulating peers (but not adults) for fear of rejection or failure (Blakemore, 2018) and others eschewing peer norms in favor of adults' values due to a failure to differentiate from parents. Research examining the social-cognitive processes underlying peer conformity while recognizing that peer influence occurs in a broader context among many disparate sources of socialization, likely will be needed to address these critical questions that still loom within the literature.

2. Socialization Likely Occurs Within Seconds, Days, or Weeks, Not Years

A middle school youth deciding not to be the only at a party to forgo an alcoholic beverage and a teen who becomes increasingly depressed after associating with a depressed best friend likely have been unwitting participants in two very different processes of peer influence. Yet the manner in which scientists have studied each socialization process most often has been identical across a wide range of outcomes and peer relationship contexts. There may be numerous distinct socialization processes that require unique theoretical approaches, methodological designs, as well as measurement tactics to adequately capture peer socialization effects. Yet the majority of prior work in developmental science has relied on questionnaire-based assessments at annual or semi-annual intervals.

There are many limitations to this common methodological paradigm for best understanding peer influence effects, but perhaps most important is that this approach may not cover an appropriate time interval between exposure to peers' attitudes and behaviors and youths' own adoption of similar attitudes or behaviors to be able to capture what may be attributable to socialization effects. Note that in extant work, the behaviors of youths' peers typically are assessed at an initial time point (often involving retrospective recall of behaviors that may have occurred over the past six months to a year) and then used in statistical analyses to predict youths' own behaviors reported several months or even a year later. It is therefore unknown whether youth are exposed repeatedly to the behaviors that are reported by their friends at a study's initial time point, and prior work suggests that in some cases youth may remain affiliated with a best friend only for a few months (Poulin & Chan, 2010); thus, it seems likely that the study of peer influence processes over a six or twelve month interval are, at least in some cases, underestimated.

Yet, the need to study peer influence processes over a time frame that more closely matches the phenomenon under investigation is not a problem merely because it may misrepresent the size of statistical effects. More importantly, theoretical accounts suggest that, in some circumstances, peers may influence youths' own behavior within a few moments, perhaps over the span of days or weeks at most and current methodological approaches make it difficult to identify these effects and understand the conditions that may be most exciting to study among peer influence researchers. Interestingly, there are numerous theoretical models that may suggest varying mechanisms for peer socialization that may be especially relevant to specific outcomes. Socialization of internalizing symptoms, for instance, might involve a range of different processes, some of which may occur rapidly, over the course of minutes, such as social mimicry that produces almost immediate social replication/contagion of negative affect (speed dating Pe, Gotlib, Van Der Noortgate, & Kuppens, 2016), others may evolve over the course of days or weeks, such as peers' mutual maladaptive conversations regarding life stressors (e.g., co-rumination; Rose, 2002), yet others may need months or even years to be visible, for example contagion of maladaptive attributional styles conferring long-term cognitive vulnerability to depressive symptoms (Stevens & Prinstein, 2005). In contrast, externalizing symptoms and health risk behaviors may be contagious among peers over short time intervals via direct socialization pressures or through behavioral reinforcement (Dishion et al., 1996), while in some cases they may occur over longer time frames, perhaps due to youths' impression that their engagement in these behaviors may help them feel more aligned to idealized others (Gerrard et al., 2008). In sum, deciding on the time interval to appropriately capture socialization effects may require careful considerations about the specific outcomes under investigation. Yet despite

these various distinct theoretical models for understanding the processes underlying potential peer influence, most studies use identical procedures to identify socialization processes.

Many relevant questions would be far easier to explore through approaches that allow for the examination of shorter time intervals, either by using experimental designs (see Allen, Porter, & McFarland, 2006; Prinstein, Brechwald, & Cohen, 2011; Gommans, Sandstrom, Stevens, ter Bogt, & Cillessen, 2017), observational paradigms, or the measurement of in vivo social interactions in real time. For example, is conformity more likely to occur in particular mood states or in certain contexts (e.g., Weerman et al., 2018)? Are there unique types of social interactions (e.g., shared mutual experiences, positively reinforcing talk, conflicts, threats to relationship stability) that are more likely than others to promote peer contagion (e.g., Dishion et al., 1996)? Does attitudinal conformity precede behavioral conformity or vice versa? How many social interactions are needed before socialization occurs, and does this differ across individuals or outcomes?

In this regard, ecological momentary assessments (EMA) might offer an exciting opportunity to understand social interactions in a manner that may be especially important to capture peer influence phenomena; yet, these methods are utilized relatively infrequently within the peer relations research field. Prior EMA work offers initial support for the potential to better understand peer influence processes unfolding in real time. For instance, previous work examining children's physical activity over seven consecutive days showed that engagement in physical activity was more intense when children were in the presence of their peers (Salvy et al., 2008). Another study assessing adolescents' marijuana use multiple times a day over the course of two weeks revealed that the vast majority of instances in which participants used marijuana occurred in the presence of peers who also used marijuana (Buckner et al., 2012). The potential

of such approaches to shed light on peer influence effects emerged clearly in a more recent study in which adolescent musicians were followed during a residential tour lasting several days (Block & Burnett, in press). Each day all adolescents were asked to report on their mood as well as their most significant interactions (i.e., with specific peers). This clever design allowed the authors to collect EMA data among all adolescents in a real-world social network and, subsequently, to estimate peer influence effects by modeling these data through social network analyses (i.e., stochastic actor based modeling; Snijders et al., 2010). Results provided support for contagion effects, suggesting that adolescents mood became more similar to the peer with whom they interacted the most (Block & Burnett, in press).

Building on this exciting work, future research may further benefit from utilizing similar methods, especially if combined with social network or dyadic designs to allow the proper investigation of peer influence effects by measuring both youth and their peers' behavior. Moreover, repeated EMA may be embedded in more traditional longer-term designs, thus offering unique opportunities to elucidate how daily peer dynamics (e.g., mood contagion) may underlie longer term peer influence effects (e.g., depression contagion). Finally, assessing emotional, behavioral and social experiences multiple times over the course of each day, for multiple days or weeks, would yield fine-grained data to identify specific emotional states or situations when youths are more likely to conform to their peers' behavior. Mounting evidence indicates that this type of intensive longitudinal data can be easily collected among adolescents (see van Roekel et al., 2019), and recent advances in analytical techniques (e.g., dynamic structural equation modeling; Asparouhov et al., 2018) now offer unique opportunities to model between- and within-person dynamics to adequately answer these questions. These approaches potentially could be also utilized to collect dyadic data or perhaps even data among larger peer

groups and social networks. In doing so, it may even be possible to use technology to capture both passive forms of influence that are beyond the ability of youth to report themselves (Harari et al., 2016).

3. Peers May Influence One Another in Indirect Ways

Adolescents who use marijuana often have friends who also use marijuana. But social interactions among these peers likely create opportunities for socialization that extend far beyond marijuana use. This is for two reasons. First is that marijuana use likely co-occurs with many other risk behaviors that friends may simultaneously discuss or engage in, suggesting a context rich for *polysocialization* of many risk-behaviors. But second, and perhaps more importantly, affiliation with these friends may socialize adolescents to a wide range of risk-taking attitudes, social comparison processes, and even missed opportunities to engage in alternate behaviors that each may exert a powerful force on adolescents' own development. Thus, the study of peer influence may benefit by extending beyond the examination of direct effects (i.e., friends' drug use predicts youths' drug use) to better capture a myriad of "indirect effects" – that is, to understand the multifinality associated with exposure to a peers' engagement in a specific identified behavior.

Researchers have offered many possible modes by which youth come to emulate their peers (see Laursen, 2018). Some of these are quite explicit, involving cajoling or social sanctions if youth fail to conform (i.e., classic peer pressure), but most suggest that socialization occurs through a variety of implicit modes (Brown, Bakken, Ameringer, & Mahon, 2008). Thus it is likely, perhaps more often than not, that youth are influenced not by observable behaviors, but by the attributions, assumptions, and estimations that are associated with discrete behaviors.

For instance, a preadolescent at a party where most others use marijuana may begin to associate rule-breaking with high status, might develop altered perceptions regarding the health risks associated with drug use, or may develop beliefs that the vast majority of their peers already have begun using marijuana. These new beliefs are likely potent predictors for a wide range of different outcomes (e.g., driving under the influence, sexual risk-taking, or perhaps a lower likelihood to engage in health-promotion behaviors) that would be missed if the scope of peer influence was constrained to only include this child's own marijuana use as an outcome. Recent work has provided initial support for this "indirect-effects" hypothesis; for example, adolescent girls whose friends reported low level of moral disengagement were found to show decreases in bullying perpetration over time (Sijtsema et al., 2014), likely because the cognitive mechanisms, and related attitudes of their friends did not align with their own aggressive behavior. In another study, similar indirect effects were revealed by showing that friends' aggressive behavior not only predicted adolescents' own aggressive behavior over time but also their engagement in rule-breaking behavior (Kornienko, Davila, & Santos, 2019; for another example, see also Gremmen et al., 2019).

Notably, research on indirect effects of peer influence may not only be relevant for better identifying socialization processes, but also to reveal risk factors for outcomes that otherwise have been hard to predict. For instance, in our prior work we aimed to understand why some adolescents engage in nonsuicidal self-injurious behaviors (NSSI) (e.g., cutting) (Giletta, Burk, Scholte, Engles, & Prinstein, 2013). Notably, prior research has revealed only a few consistent predictors of NSSI and very few prospectively (Fox, Franklin, Ribeiro, Kleinman, Bentley, & Nock, 2015). Our research examined both direct and indirect forms of peer influence. Adolescents' friends NSSI did not predict adolescents' own NSSI engagement; however,

adolescents' friends' depressive symptoms and impulsivity (among boys) were associated significantly with adolescents' NSSI over time, suggesting an indirect pathway that revealed a socialization effect of peers previously unrealized. Future research may benefit by examining similar indirect effects, including cascade models in which specific types of peers' behaviors are used to predict a wide range of processes and outcomes that may be more relevant than previously realized.

4. Not All Youth Are Equally Susceptible to Peer Influence

Many children and adolescents are exposed to maladaptive social norms, yet only some youth emulate their peers. We don't know why. For many years, this has been examined by exploring moderators of peer influence. In other words, investigators searched for constructs reflecting individual differences in influencers' traits and behaviors (e.g., popularity), influencees' characteristics (e.g., self-esteem, social anxiety, family dysfunction, genetic variability), dyadic relationship qualities between influencers and influencees (e.g., friendship stability, reciprocity), or family/parenting dynamics (e.g., parenting styles; Mounts & Steinberg, 1995) that may change the strength of the association between youths' and their friends' behaviors (see Brechwald & Prinstein, 2011). The good news is that this line of research offered insight to predict which adolescents may be more likely to conform to peers' behaviors than others. The bad news is that many of the peer influence moderators that were revealed also were potent predictors of maladaptive outcomes in their own right; thus, it is difficult to determine whether results reflected a synergistic combination between independent risk factors towards risk and deviant behaviors, or whether these moderating constructs truly altered the power of peers as socializing agents.

It is not known whether individuals may differ in peer influence susceptibility as a construct in its own right. On the one hand, it may be the case that susceptibility to peers simply reflects a general tendency, that is, a broader form of sensitivity to different environments (i.e., domain general susceptibility; Ellis et al., 2011). For example, numerous evolutionary and developmental theories (for a review, see Greven et al., 2019), such as differential susceptibility (Belsky & Pluess, 2009) and biological sensitivity to context (Boyce & Ellis, 2005), suggest that due to genetic influences or early rearing experiences, individuals vary in their sensitivity to environmental stimuli. Notably, as compared to their peers, sensitive individuals are expected to be at greater risk for maladaptive outcomes in adverse and negative environments, but to benefit more from supportive and positive environments. Thus, it may be that the same youth who are more strongly responsive to their family environment are inherently also more attuned to, and perhaps more motivated to emulate peers' behaviors than others.

On the other hand, it might be the case that some adolescents are specifically sensitive to their peer environment, more so than any other social environment (i.e., domain specific susceptibility; Ellis et al., 2011). In other words, susceptibility to peers might be a different construct and youth who are more susceptible to their peers may not necessarily respond more strongly to other environmental influences. This idea would be consistent with theoretical accounts and empirical evidence suggesting that with the transition to adolescence youth undergo a profound social re-orientation, involving changes at the neurobiological level, that make them particularly attuned and responsive to their peers in particular (Nelson et al., 2016). For example, prior work has revealed that as compared to children and adults, early adolescents are more likely to conform to their peers' behavior than to adults' behavior (Knoll et al., 2015). Moreover, adolescents' neural responses to peers (compared to parents) have been related to engagement in

risk behaviors and affiliation with risk-taking peers (Saxbe et al., 2015). Unfortunately, to date little work has benefitted from insights from this research to examine possible psychological and especially neurobiological markers of susceptibility to peer influence effects (Do, Prinstein & Telzer, in press).

Thus, investigators ability to capture peer influence susceptibility as a discrete and measurable construct has remained challenging. This may also be because there is a strong need for more theory to elucidate whether susceptibility is a construct that varies between individuals, or perhaps varies more strongly within individuals. Indeed, it may also be that susceptibility is even more domain specific, with some youth being more likely to conform to their peers within some contexts (e.g., in the presence of high status peers, when social stakes are high; Cohen & Prinstein, 2006; following social exclusion, Peake, Dishion, Stormshak, Moore, & Pfeifer, 2013; when teachers offer low levels of emotional support, Shin & Ryan, 2016) more than others, for some behaviors (i.e., less risky/dangerous) more than others, or in some mood states (e.g., anxiety, depressed) more than others. These questions rarely have been examined within the developmental literature, however.

There have been numerous attempts to examine between-subjects differences in peer influence susceptibility, however. Each offers exciting promises that should stimulate more research. For instance, Steinberg and colleagues have developed a self-report instrument designed to capture youths' perceptions of resistance to peer influence. Amassing evidence suggests that adolescents report lower resistance to peer influence than do adults (Steinberg & Monahan, 2007), variability in this measure is associated with predictable variation in neural responses to emotional stimuli (Grosbras et al., 2007; Pfeifer et al., 2011), and also moderates the association between peers' and youths' own behaviors (DiGuseppi et al., 2018; Monahan et al.,

2009). As a self-report measure, it remains unknown whether all youth are equally capable of the meta-cognitive skills likely required to reflect upon and reliably report their own conformity to the behavior of their peers, or whether individuals are always aware of socialization forces that guide their attitudes and behavior.

Numerous performance-based tasks also have been proposed in attempts to assess the construct of peer influence susceptibility. For instance, several tasks have been developed to capture youths' tendencies to change their attitudes or decisions before versus after exposure to peers. Allen and colleagues (2006), for instance, revealed that more dramatic changes in adolescents' decisions on a hypothetical problem-solving task after interaction with an influential peer significantly predicted changes in adolescents' own behavior over time. Prinstein and colleagues revealed that the prospective association between adolescents' peers' risk behavior and adolescents' own risk behavior was significantly moderated by adolescents' tendencies to change their reports of the likelihood of engaging in risk behaviors during versus prior to chat-room interactions with high status peers (Choukas-Bradley et al., 2014; Prinstein et al., 2011). Additional innovative experimental-based measures of susceptibility have demonstrated that adolescents' susceptibility to peer influence, and likelihood of conforming to peers, may be influenced by the specific peers (e.g., high or low status) who communicate peer norms (Gommans et al., 2017). Still another more recent approach drawing on old sociological theories regarding susceptibility "thresholds" (Granovetter, 1977), revealed that adolescents' responses on an analogue measure of peer susceptibility significantly moderated the prospective association between friends' and adolescents' own alcohol use, even more strongly than did scores on a self-report instrument of resistance to peer influence (Duell et al., in press). Each of these approaches offers exciting new directions for research, and may benefit from additional

work to examine how susceptibility may vary between and within individuals, for example across between-person traits, such as race/ethnicity, developmental levels, peer status, the importance one places on popularity (Ryan & Shim, 2008; Trucco, Colder, Bowker, & Wieczorek, 2011), or in different within-person conditions (e.g., across different affective states, developmental stages, or contexts; Peake et al., 2013).

5. Youth Are Influenced Towards Both Adaptive and Maladaptive Behaviors

Recently, Allen and colleagues (in press) have effectively argued that youth who are influenced by their peers likely possess a variety of adaptive traits. Indeed, the ability to perceive social norms, the motivation to maintain close interpersonal ties, and the skills required to nimbly adjust one's attitudes and/or behavior all have been cited in literature on healthy adjustment (Allen, Loeb, Kansky, & Davis, in press). In fact, evolutionary hypotheses within psychological, sociological, and anthropological literatures have suggested that humans' attunement to the social context and desire to maintain affiliation with others may have been critical to our survival as a species, as can be seen in a variety of physiological and genomic sequelae of social exclusion (see Prinstein & Giletta, 2020 for a review). In their work, Allen and colleagues (in press) revealed that peer influence susceptibility was predicted by higher adaptive traits, including high quality mother-child relationships and positive reputations from peers.

Thematically consistent, research recently has proliferated to demonstrate that youth are likely not only to emulate their peers' deviant, risk, or maladaptive behaviors, but also prosocial behavior (e.g., Choukas-Bradley et al., 2015; van Hoorn et al., 2014) and prosocial risk taking behavior (Do, Moreira, & Telzer, 2016). Findings have important implications, suggesting that

the process of peer influence may be adaptive, normal, and perhaps even encouraged, but the context in which peer influence occurs deserves great consideration from a prevention perspective, with adolescents' tendency to reward deviant behavior worthy of greater direct attention than adolescents' tendency to emulate their peers (Allen et al., in press).

Important and exciting directions for future research emerge from this perspective and body of work. For example, this work emphasizes the need for future peer influence research to employ methodological and analytic approaches that allow the disentanglement of positive and negative peer influence effects (e.g., Laursen et al., 2012). To date this aspect rarely has been taken into account leading to the likely incorrect assumption that peer influence mainly affects youth developmental trajectories in a negative manner (Berndt & Murphy, 2003). Indeed, researchers have often neglected the notion that findings from the most common analytic approaches used to infer peer influence effects (e.g., cross-lagged approach), may actually also reflect positive peer influence. For example, a positive cross-lagged effect from peers' depressive symptoms on subsequent adolescents' own depressive symptoms (after accounting for adolescents' initial levels of depressive symptoms) may not only indicate that adolescents who have depressed friends are more likely to become depressed themselves but also that adolescents whose friends report lower levels of depression may be more likely to show decreases in their levels of depressive symptoms over time. A number of different approaches could be used to disentangle positive from negative peer influence effects. For instance, in the context of observational (i.e., non-experimental) longitudinal studies more attention could be paid to model individual differences in intra-individual changes over multiple (i.e., three or more) discrete time points. This could be achieved through latent growth modeling, for example, which allows the estimation of individual developmental trajectories and thus could be used to test the

extent to which youth behavior increases (vs decreases) over time as a function of their peers' behavior. Although rare, similar approaches have been previously utilized in peer influence research; however, unfortunately, most of this work relied on youths' perceptions of peers' behaviors (e.g., Simons-Morton et al., 2004; Wills, & Cleary, 1999), which are well-known to be biased (e.g., Prinstein & Wang, 2005; Ross et al., 1977). For example, Curran and colleagues (Curran, Stice, & Chassin, 1997) revealed that during adolescence developmental trajectories of alcohol use increased over time and adolescents who initially perceived their friends to use more alcohol showed the strongest increases. In another study, dieting behavior in the friendship group (assessed via friends' own self-report) was found to predict both the intercept and the growth of adolescent males' own dieting behavior over time (Rancourt, Conway, Burk, & Prinstein, 2013). Interestingly, follow-up analyses of growth trajectories highlighted that this effect was mainly driven by males decreasing in their dieting behavior if their friendship group reported initial low levels of dieting behavior (although this effect only approached significance); conversely, males' whose friendship group reported high levels of dieting behavior at baseline showed a non-significant positive increase over time.

Stochastic actor-based modeling (Snijders et al., 2010), a longitudinal social network approach to estimate peer influence, also offers opportunities to differentiate between behavioral increases and decreases over time. Specifically, by estimating influence effects using the so-called "endowment" function in combination with either the "evaluation" or "creation" function (see Ripley, Snijders, Boda, Vörös, & Preciado 2020) yields separate parameters indicating the extent to which peer influence reflects behavioral increases versus decreases over time. Unfortunately, very few published studies have attempted to use these functions, perhaps due to the computational and convergence problems that may result from estimating such complex

models. In one of the few existing examples (Rambaran et al., 2017; for a related example, see Haas & Schaefer, 2014), adolescents were found to be influenced by their friends to more strongly increase (rather than decrease) their truancy as well as their academic achievement. These findings provide clear support for both the negative (increases in truancy) as well as positive (increases in academic achievement) effects of peers on adolescents' academic functioning.

Finally, positive versus negative peer influence could be manipulated directly in the context of experimental studies. Although examining negative influence on real-life behaviors may at times be prevented due to ethical reasons, experimental designs could be used to investigate influence effects related to positive behavior or risky attitudes and decision-making. To date, similar experimental studies have provided empirical support for positive peer influence effects; for instance, adolescents have been shown to report higher prosocial attitudes after being exposed to the prosocial attitudes of popular peers (e.g., Choukas-Bradley et al., 2015) or to engage in safe decisions when they saw their peers making safe choices (e.g., Braams, Davidow, Somerville, 2019). Unfortunately, the generality of these findings to real-world processes and behaviors remains challenging.

Differentiating between positive and negative influence effects also may require a closer examination of contextual conditions, as well as relational and individual characteristics that may determine *when* peers are more likely to exert positive rather than negative influence. In this regard, it will be particularly important to understand whether the same adolescents who emulate their peers' maladaptive behavior also are likely to emulate adaptive behaviors, or whether individuals' general dispositions towards risk versus prosocial attitudes may moderate the "direction" of peer influence. Similarly, it would be helpful to understand whether the same

mechanisms that purportedly drive deviant peer influence (i.e., based on behavioral reinforcement or identity-affirming theories; Heilbron & Prinstein 2008) prove similarly relevant for prosocial peer influence. Last, it may be especially interesting to determine whether neural correlates of peer influence (e.g., Do et al., 2016) may apply similarly to both adaptive and maladaptive outcomes, or whether different socialization agents (i.e., adults, peers) may differ in influential power based on the type of valence of the outcome.

Conclusion

Peer influence processes have been studied for several decades and continue to represent a central topic in the fields of developmental psychology, psychological science, and social science more broadly. Overall, this fascinating research has yielded many important findings to understand the impact of peer influence effects on children's and adolescents' development. Hoping that this will continue to be a vibrant research area, this paper offered five primary directions that we think could drive future research. Each direction has been inspired by research theories and methods in related research domains. For instance, advances in theories, methods and tools to collect and analyze real time data, to examine online interactions, and to study brain development and neurobiological processes, are only a few examples of recent insights that have the potential to offer unique opportunities to study of peer influence processes. Integrating this research will be fundamental to significantly expand our understanding of how and when peer influence takes place and to eventually leverage these effects, or perhaps make good use of them.

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