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## Internet use and video gaming predict problem behavior in early adolescence

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### A B S T R A C T

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In early adolescence, the time spent using the Internet and video games is higher than in any other present-day age group. Due to age-inappropriate web and gaming content, the impact of new media use on teenagers is a matter of public and scientific concern. Based on current theories on inappropriate media use, a study was conducted that comprised 205 adolescents aged 10–14 years ( $Md = 13$ ). Individuals were identified who showed clinically relevant problem behavior according to the problem scales of the Youth Self Report (YSR). Online gaming, communicational Internet use, and playing first-person shooters were predictive of externalizing behavior problems (aggression, delinquency). Playing online role-playing games was predictive of internalizing problem behavior (including withdrawal and anxiety). Parent-child communication about Internet activities was negatively related to problem behavior.

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Late childhood and early adolescence represents the age when video game use is most time-consuming (Rideout, Roberts, & Foehr, 2005), and adolescents aged 12–17 are the age group with the highest ratio of Internet users (87%, Pew Foundation, 2005). New media offer a vast amount of useful products, including web pages tailored to the needs of adolescents, and educational games. At the same time, new media provide ominous content, including web pages with age-inappropriate audiovisual material, violent video games, and unprotected chat rooms and discussion boards (e.g., Donnerstein, 2009; Funk, 2009). Consequently, the relationship between media use and normal versus problematic adolescent development is a matter of concern. In the present study, we focused on the age of early adolescence, and distinguished between adolescents with low to moderate behavior problems within the limits of healthy teen development and young adolescents with marked problem behavior. Patterns of Internet and video game use were identified which predicted whether or not a teenager fell into the problem behavior group.

#### *Problem behavior in early adolescence*

The transition from childhood to adolescence is affected by significant changes on emotional and cognitive levels. The formation of an identity in interaction with the self and the environment is one of the 'classical' developmental tasks in this period (e.g., Erikson, 1988). Nowadays, the mass media play an increasingly important role in adolescents' identity formation, which brings about new challenges, but also new opportunities (Arnett, 2002; Jensen, 2003). Early adolescence has been described as a time of high arousability and of increased vulnerability to problems in the regulation of affect and behavior

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(Arnett, 1999; Steinberg, 2005). However, most adolescents master the challenges of adolescence fairly well, although they may at times feel a deep worry about their future or about society, or engage in minor unlawful or risky behavior (e.g., Farrington, 1995; Miller & Byrnes, 1997). It is crucial, however, to distinguish between unremarkable problem behavior and those feelings, thoughts and actions that signal manifest problems that are likely to persevere.

Adolescent problem behavior as a clinically relevant phenomenon has been described along two dimensions, labeled as inhibition versus aggression (Miller, 1967), overcontrolled versus undercontrolled (Achenbach & Edelbrock, 1978), or internalizing versus externalizing problems (Achenbach, 1966, 1991). Aggressiveness and juvenile delinquency are typical examples of externalizing problem behavior. Internalizing behavior problems include social withdrawal, anxiety, depression, and somatic complaints (Achenbach, 1991). Problem behaviors along the lines of internalizing versus externalizing problems are assessed through clinical interviews or self-report scales, including the Youth Self-Report (YSR, Achenbach, 1991). However, we are aware of only two studies that related new media use with scores on this (or any other) widely used measure of clinically relevant problem behavior (Funk et al., 2002; Lohaus, Ball, Klein-Hessling, & Wild, 2005). We will look more closely at the distinction between externalizing and internalizing problems in order to briefly review the literature on media use and variables that are indicative of problem behavior.

#### *New media use and externalizing problems*

There is strong empirical evidence for a link between the consumption of violent video games like first-person shooters and other violent media and aggression. The empirical evidence is based on experimental and correlational studies with different samples, including children, adolescents, and adults (e.g., Anderson, 2004; Anderson & Bushman, 2001; Anderson & Dill, 2000; Barlett, Harris, & Baldassaro, 2007; Gentile, Lynch, Linder, & Walsh, 2004; Krahe & Möller, 2004; Wei, 2007). According to Anderson and colleagues' 'General Aggressiveness Model' (GAM, Anderson & Bushman, 2002), violent media content desensitizes the media user to both real-life violence and media violence, which in turn makes aggressive behavior more likely, as users of violent media develop stable patterns of aggressive cognitions, emotions, and aggression-legitimizing attitudes over time. In addition to offline computer and console games, the Internet may be a new potential transport device for violent media contents such as violent movie clips and violent video games (Funk, Bechtoldt Baldacci, Pasolt, & Baumgardner, 2004).

While the empirical support for the violent media-aggression link in controlled laboratory settings is largely undisputed, there is still some scientific debate as to its importance in the context of real-life behavior problems and youth delinquency (Bensley & Van Eenwyk, 2001; Ferguson, 2002; Sherry, 2007; Unsworth, Devilly, & Ward, 2007). Part of the controversy may be due to inadequate indicators of problem behavior in some studies that reported null findings (cf. Funk, 2009). What are the results of the two studies that obtained self-report data from the YSR? In the study by Funk et al. (2002), externalizing problems were found to be unrelated to playing violent games. The delinquency subscale was even more elevated for boys with low violent game preference than for boys with high violent game preference. Lohaus et al. (2005) found the general amount of computer use to be positively related to externalizing problems, but correlations were only significant for girls, who generally used the computer to a far lesser extent than boys. We consider the results of both studies as preliminary. The results of Funk et al. (2002) are based on a small sample with  $N = 32$  participants in total and  $n = 8$  adolescents with elevated problem behavior. This may have led to a substantial Type II error. The Lohaus et al. (2005) study did not differentiate between different kinds of computer use, thus potentially obscuring relevant relationships.

#### *New media use and internalizing problems*

While there is a history of research on the cultivation of fear by TV violence (e.g., Gerbner, Gross, Signorielli, Morgan, & Jackson-Beeck, 1979) and on fright reactions following exposure to violent movies (cf. Cantor, 2009), the impact of violent video games on internalizing problems, including anxiety and withdrawal, is less clear (cf. Appel & Jodlbauer, in press; Sparks, Sparks, & Sparks, 2009). In one study that addressed this relationship, Funk et al. (2002) found a trend ( $p = .06$ ) that related violent video game play to substantial internalizing problem behavior. Recently, the popularity of massively multiplayer online role-playing games (MMORPGs) has given rise to the question of a link between playing fantasy games and internalizing problems (e.g., Funk, 2009). These fantasy games contain less gore than first-person shooter games, but some fighting and violence is included. A core feature of these fantasy games is slipping into the role of a virtual character. 'Trying out' a new identity during game play may have the potential to assist adolescent development, but it may also distract from real-world challenges and opportunities. Earlier research did not find substantial correlations between the engagement in offline fantasy role-playing games and psychopathological problems (e.g., Carter & Lester, 1998; Rosenthal, Soper, Folsie, & Whipple, 1998). However, regarding online role-playing games, there is tentative evidence for detrimental effects from case studies in the field of psychiatry, which linked playing Internet-based fantasy games to internalizing problems such as anxiety and depression (Allison, von Wahlde, Shockley, & Gabbard, 2006; Mitchell, 2000; Salguero & Morán, 2002). Beyond these case studies, we are not aware of any studies that investigated the link between adolescent fantasy gaming and internalizing problem behavior.

The 'internet paradox' (Kraut et al., 1998) – a communication technology may lead to more loneliness – has received limited support in recent years. A number of studies reported null findings between Internet use and indicators of internalizing problems such as loneliness and depression scores (e.g., Gross, Juvonen, & Gable, 2002). However, several

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