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Longitudinal patterns of involvement in cyberbullying: Results from a Latent Transition Analysis

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ABSTRACT

In the present study, we used Latent Transition Analysis as an innovative approach in cyberbullying research in order to detect multi-faceted involvement patterns. Since developmental aspects of cyberbullying are still poorly understood, we analyzed the stabilities and transition probabilities of these involvement patterns across time using longitudinal survey data. Based on a three-wave panel survey among 1723 pupils (12–15 years old), we identified a five-latent status model to best fit the data. Apart from a large group of non-involved pupils, there were four moderately to heavily involved cyberbullying classes, all characterized by a co-occurrence of perpetration and victimization experiences. We found two moderate and content-specific classes of cyberbullying: gossiping patterns that were predominant among girls and insulting patterns that rather appeared among male and lower-educated adolescents. Moreover, we revealed a heavily victimized group (with mild perpetration) and a very small class of heavy perpetrator-victims. Transition probabilities showed that cyberbullying behavior was quite stable over time.

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1. Introduction

Although cyberbullying research has increasingly consolidated in recent years, there still is an ongoing discussion on conceptual and measurement issues, and the empirical results based on these conceptual foundations. Many studies have investigated the prevalence, causes and consequences of cyberbullying, whereas the specific forms of cyberbullying have received less attention. Previously, Willard (2007) listed different forms of cyberbullying and cyberthreats, including harassment as repeated sending of insulting messages, denigration as destroying a person's social reputation and outing and trickery as publicly forwarding of personal information (p. 8–14). Based on this and other systematizations (partly derived from traditional bullying research), researchers have developed various lists of behavioral items, mostly in order to measure the intensity of cyberbullying involvement (for an overview see Kowalski, Giumetti, Schroeder, & Lattanner, 2014). In

contrast, only little empirical effort has been made to actually look at content-related emphases and different dimensions or patterns of cyberbullying involvement. Some studies indicated that, in addition to differences in the intensity of involvement, content-based emphases might be a valid criterion of distinction in cyberbullying research ("methods" of bullying, see Law, Shapka, Domene, & Gagné, 2012).

In the present paper, we focused on this multi-faceted understanding of cyberbullying and tried to identify qualitatively distinct patterns of involvement. Since developmental aspects of cyberbullying, i.e. the "careers" of bullies and victims, are still less well understood than in traditional bullying research, we additionally investigated the stability of these patterns and possible developmental trajectories using longitudinal survey data. Following recent methodological advances in bullying research (see Ryoo, Wang, & Swearer, 2015), we applied a longitudinal person-oriented approach called Latent Transition Analysis (LTA) to a large sample of high school pupils. Using this approach, we identified different cyberbullying patterns by taking into account inter-individual variations in the extent and form of cyberbullying involvement across time. We add to existing research not only by identifying these qualitatively different patterns of perpetration

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and victimization, but also by estimating the stability and transition probabilities of these cyberbullying involvement patterns over time.

2. Patterns of cyberbullying involvement

Generally, differences in prevalence data regarding involvement in cyberbullying may reflect real differences in person's socio-demographics and personal features, but can also be the result of methodological differences between studies such as methods of measurement.

2.1. Prevalence and measurement approaches

Previous studies on cyberbullying reported a wide range of prevalence rates. In a recent meta-analysis considering 80 empirical studies, [Modecki, Minchin, Harbaugh, Guerra and Runions \(2014\)](#) found variations in prevalence rates between 5 and 32 percent for perpetrators (on average 16%) and between 2 and 56 percent for victims of cyberbullying (on average 15%). Variations in prevalence rates may stem from differences in definitional issues, cut-off criteria regarding cyberbullying frequency (singular incident measures favoring overestimated rates vs. frequent incident measures favoring underestimated rates, e.g. [Slonje & Smith, 2008](#)), the set time frame (incident within the last six month, year, or at all), the samples referred to (age- or location-based differences, see [Livingstone, Haddon, Görzig, & Olafsson, 2011](#)), or the used measurement approaches (definition-based measures favoring underestimated rates versus behavior-based measures favoring overestimated rates, see [Vandebosch & van Cleemput, 2009](#); for an overview see also [Kowalski et al., 2014](#)). Furthermore, if behavior-based measures are used, it needs to be discussed, which behaviors are indicative and how many behaviors need to occur in order to be classified as perpetrator or victim.

In traditional bullying, researchers have begun to use person-centered approaches that abstain from predetermined cut-off points and rather rely on observed response patterns. Thereby, the detected latent classes are allowed to differ according to various dimensions (e.g., the frequency and specific forms of involvement). Using Latent Class Analysis (LCA), [Nylund, Bellmore, Nishina and Graham \(2007\)](#) found that victims of bullying might be best classified according to the extent of their victimization, differentiating between victimized, sometimes victimized, and nonvictimized children. These classes were characterized by high, moderate or no indication of victimization, not depending on the particular form of the bullying (e.g., physical versus relational). The findings also showed that the size of the most victimized class decreased with growing age of the participants. [Ryoo et al. \(2015\)](#) explicitly looked at the changes of latent classes over time by estimating a Latent Transition Analysis (LTA). According to their results, latent statuses are characterized by the frequency (frequent, occasional, and infrequent) and by the form of involvement (cyberbullying versus traditional bullying). For victimization, they identified four (frequent victims, occasional traditional victims, occasional cyber and traditional victims, and infrequent victims), for perpetration three different latent statuses (frequent perpetrators, occasional verbal/relational perpetrators, and infrequent perpetrators). Their study also revealed that individuals usually transitioned into less frequently involved groups over time. Regarding their used method, they conclude that person-centered approaches are generally less prone to distortion and misclassification, since they use “response patterns of observed variables to assign individuals to unobserved latent groups” ([Ryoo et al., 2015](#), p. 106).

Ryoo and colleagues already focused on the overlap of traditional bullying and cyberbullying. However, they separately

calculated traditional and cyber perpetration classes as well as traditional and cyber victimization classes, without considering the co-occurrence of perpetration and victimization throughout the contexts. Regarding cyberbullying, previous factor analyses, however, showed that many items measuring perpetration and victimization are influenced by one latent construct ([Law, Shapka, Hymel, Olson, & Waterhouse, 2012](#); [Menesini, Nocentini, & Calussi, 2011](#)). [Schultze-Krumbholz et al. \(2015\)](#) performed a LCA that indicated the existence of exclusive classes, whose members were likely to report being either a perpetrator or a victim of traditional bullying. In contrast, it was shown that individuals involved in cyberbullying were likely to report that they had acted as perpetrator, but also suffered from being victimized. [Schultze-Krumbholz et al. \(2015\)](#) identified three cyberbullying groups with different degrees of involvement: non-involved (70%), bully-victims (26%) and perpetrators with mild victimization (4%). It became also clear that using person-centered clustering techniques such as LCA resulted in a more accurate detection of co-occurring cyberbullying perpetration and victimization patterns – compared to conventional (threshold-based) classifications that overestimated the prevalence of exclusive perpetrator and victim groups.

2.2. Individual differences

In addition to methodological differences, previous research has shown that involvement in cyberbullying varies with the age and gender of the respective persons. In a recent meta-analysis examining 122 effect sizes, [Barlett and Coyne \(2014\)](#) provided evidence that male adolescents were generally more likely to perpetrate cyberbullying. However, the meta-analysis also showed that this difference was strongly moderated by age. Specifically, female adolescents were more strongly engaged in cyberbullying during early and middle adolescence, while male perpetrators more likely acted as cyberbullies in later adolescence. Unlike the perpetration of cyberbullying, the role of age and gender for becoming victimized still is rather unclear. Based on a systematic review, [Tokunaga \(2010\)](#) concluded that female and middle-aged adolescents showed a high risk of suffering from victimization. [Schultze-Krumbholz et al. \(2015\)](#) found an overall stronger involvement in cyberbullying among older adolescents. Moreover, the researchers reported that females were more likely to be in the cyberbullying perpetrator-victim group, while males were more likely to be in the perpetrator-with-mild-victimization group. In a similar vein, [Menesini et al. \(2011\)](#) confirmed the existence of a perpetrator-victim pattern for both males and females, although females scored considerably lower on all cyberbullying items. In addition to age and gender, there are some hints in literature that the education level of adolescents might be an important influencing factor (see [Festl & Quandt, 2016](#)) that, however, has been rarely analyzed in cyberbullying research. Finally, many previous studies have found that traditional school bullying and cyberbullying involvement co-occur (e.g., [Modecki et al., 2014](#); [Vandebosch & van Cleemput, 2009](#); [Walrave & Heirman, 2011](#)). We therefore argue that previous involvement in traditional forms of bullying – either as perpetrator or victim – in school is expected to be associated with the different patterns of involvement in cyberbullying.

Previous studies have shown that some individual characteristics are associated with the level of involvement in cyberbullying. However, it is also known that different individuals, for example boys and girls (e.g., [Archer, 2004](#); [Björkqvist, Lagerspetz, & Kaukiainen, 1992](#)) or also younger and older adolescents (e.g., [Barlett & Coyne, 2014](#)), use different aggressive behavioral strategies in order to position within the peer group and manipulate the according peer relationships. Therefore, different patterns

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