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### Keeping youth in play

*The effects of sports-based interventions in the prevention of juvenile delinquency*

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General discussion





The main goal of this dissertation was to contribute to the scientific knowledge on the effectiveness of sports-based interventions to prevent juvenile delinquency in adolescents. To gain insight into the effects of sports-based crime prevention, four objectives were formulated. The first objective was to examine the relation between sports participation and juvenile delinquency in adolescents by reviewing the empirical literature on sports participation and juvenile delinquency, and to assess whether this relation was influenced by offense type and study, sample, and sports characteristics. The second objective was to gain knowledge on the effects of physical activity interventions on psychosocial outcomes in adolescents, in particular examining potential moderators (i.e., outcome, study, sample, and intervention characteristics) of effectiveness. The third objective was to test the effectiveness of the Dutch sports-based crime prevention program for adolescents at risk for developing delinquent behaviors 'Only you decide who you are' [Alleen jij bepaalt wie je bent (AJB)]. The final objective was to examine predictors of intervention success of AJB in order to establish which youth, coach, and context factors are associated with reduced risk factors and increased protective factors for delinquency.

In this final chapter, first, a summary of all studies is given. Second, the overall contribution of the studies to the theoretical and empirical knowledge on the effectiveness of sports-based crime prevention is discussed. Third, the strengths and limitations of this dissertation are mentioned. Fourth, future directions for research and practice of sports-based crime prevention are provided, and finally, the overall conclusions of the dissertation are presented.

### **Summary of the studies**

The first study, a multilevel meta-analysis on the relation between sports participation and juvenile delinquency in adolescents, showed overall no significant relation between sports participation and juvenile delinquency. This implicates that adolescent athletes were neither more nor less delinquent than their non-athletic peers. The type of offense did not influence the relation between sports participation and juvenile delinquency. Significant moderators of this relation were study characteristics (i.e., the impact factor of the journal in which a study was published and whether the design of the study was longitudinal or cross-sectional), sample (i.e., gender), and sports characteristics (i.e., sports in an out-of-school or school-setting and individual or team sports). However, the influence of the moderators was extremely small, and it was concluded that the results of the moderator analyses had minimal clinical and practical relevance. Theories on the relation between sports participation and juvenile delinquency highlight both the potential positive and negative effects of sports participation on juvenile delinquency. The absence of an overall relation between sports participation and juvenile delinquency may derive from both positive and negative influences of sports participation that neutralize each other.

In the second study, four meta-analyses examining the effects of physical activity interventions on psychosocial outcomes in adolescents were conducted. Physical activity interventions were defined as interventions with a sports or exercise component. Significant effects of physical activity interventions were found on externalizing problems, internalizing problems, self-concept, and academic achievement. Several outcome, study, sample, and intervention characteristics influenced the strength of the effect of physical activity interventions on the psychosocial outcomes. It was concluded that physical activity interventions were in general effective in reducing externalizing and internalizing problems and in increasing self-concept and academic achievement. On the other hand, some caution was advised on the implementation of physical activity interventions. It is necessary to critically evaluate for which goals and target groups the programs are used, because these types of interventions could be harmful in certain situations.

The effectiveness of AJB was evaluated in the third study, using a quasi-experimental design. In the sample of  $N = 368$  adolescents at risk for developing delinquent behaviors, significant effects of AJB were found on measures of juvenile delinquency. On the secondary outcomes (i.e., several risk and protective factors for juvenile delinquency) no significant effects of AJB were found. The absence of the expected effects on the risk and protective factors for delinquency was explained by the short follow-up time (approximately 13 months after the start of AJB) and lack of statistical power to detect small effects. Possibly, the combination of the small, but non-significant effects on the secondary outcomes could have had a cumulative effect on reducing the risk of developing delinquent behaviors, explaining why significant intervention effects were found on delinquent outcomes, but not on the individual risk and protective factors for delinquency. It was concluded that this study showed some first indications that sports-based interventions could be effective in preventing juvenile delinquency. However, empirical evidence in favor of sports-based crime prevention is still thin and there is a risk of iatrogenic effects in these types of interventions. Therefore, more research on sports-based crime prevention is needed.

In the final study, predictors of change in the outcome variables of AJB were assessed. Overall, the participants of AJB ( $N = 155$ ) showed significant improvements on seven out of eight risk and protective factors for delinquency over the course of the intervention. Improvements on the outcome variables were predicted by youth, coach, and context factors. A higher quality of the sociomoral atmosphere at the sports club, more motivation of the coach, enrollment in special education [*Praktijkonderwijs*], and participation in basketball were associated with larger reductions in risk factors and larger improvements in protective factors for delinquency. Participation in indoor soccer was associated with smaller improvements in prosocial behavior. The findings suggested that the intervention success of sports-based programs can be predicted by youth, coach, and context factors, which should be taken into account in the development and implementation of sports-based interventions.

## Discussion of the findings

This dissertation yielded important findings that contribute to the scientific knowledge on sports-based crime prevention. The first meta-analytic study showed no overall relation between sports participation and juvenile delinquency. Although the lack of association does not mean that sports participation cannot have a positive effect on juvenile delinquency, it does question the widely supported assumption that sports can 'undoubtedly' keep youth from involvement in crime (Coakley, 2011; Coalter, 2015; Kelly, 2013). This is consistent with the vision of other scholars who have researched sports-based crime prevention (Agnew & Petersen, 1989; Chamberlain, 2013; Coakley, 2011; Coalter, 2015; Lub, 2013; Wong, 2005). Above and beyond the well described positive contributions of sports participation, it is suggested that participation in sports could also have negative influences (such as deviancy training and sports-related immoral behavior; Boardley & Kavussanu, 2011; Dishion & Tipsord, 2011), explaining the absence of an overall relation between sports participation and juvenile delinquency. This does emphasize the need for a critical view on sports-based interventions.

On the other hand, the second meta-analytic study showed positive effects of sports-based interventions on psychosocial outcomes and the third study on the effectiveness of AJB revealed an effect on juvenile delinquency. Based on the studies in this dissertation, it is concluded that when sports are used as an intervention, they have a potential in contributing to positive youth development and the prevention of juvenile delinquency. This raises the question why there was no overall association between sports participation and juvenile delinquency, while we did find positive effects of sports-based interventions on psychosocial outcomes in adolescents.

In the process of this dissertation, the overall lack of robust empirical evidence for the effects of sports-based crime prevention was noticed, especially considering the common recommendation for recreation-based crime prevention approaches and the broad implementation of sports-based crime prevention programs all over the world (Chamberlain, 2013; Kelly, 2013; Lub, 2013; Nichols, 2010; Sandford, Armour, & Warmington, 2006). The studies included in the second meta-analytic study and the third study on AJB all assessed the effects of sports-based interventions with (quasi-)experimental designs. The very fact that these interventions were evaluated with methodologically robust designs could imply that the quality of the sports-based interventions is higher than that of the typical sports activities for youth. It is not unlikely that the sports-based interventions with the strongest theoretical rationale, which are best implemented, and have the most qualified staff are more likely to be evaluated according to the latest scientific guidelines than the many sports programs that have *not* been evaluated. Possibly, because of this "evaluation bias" (i.e., high quality interventions may be more likely to be evaluated than low quality activities), research on the effectiveness of sports-based intervention yielded

significant effects, but research on the relation between participation in typical sports activities and juvenile delinquency did not show significant results.

Thus, sports participation by itself may not be enough to prevent youth from developing delinquent behaviors. It seems more the way in which sports-based crime prevention programs are designed that determines whether sports could effectively prevent juvenile delinquency (Chamberlain, 2013; Coakley, 2011; Coalter, 2015; Fraser-Thomas, Côté & Deakin, 2005; Kelly, 2013). The final study of this dissertation on the predictors of intervention success of AJB provided more insight into the conditions in which sports-based crime prevention programs are effective. In line with previous studies, it is concluded that the competencies of the coach and the quality of the sports environment are important predictors of the effects of sports on the behavior of youth (Hodge & Lonsdale, 2011; Ntoumanis, Taylor, & Thøgersen-Ntoumani, 2012; Rutten et al., 2007; Smith, Smoll, & Cumming, 2007). Sports may therefore not be seen as a direct cause of positive development, but more as a context in which positive youth development can take place (Coakley, 2011). Hartmann (2003, p. 134) has summarized this principle aptly by stating: "the success of any sport-based social interventionist program is largely determined by the strength of its non-sport components". In order to develop effective sports-based crime prevention programs, the sports context should be enriched by non-specific therapeutic elements that have proved their effectiveness in youth crime prevention and sports-based interventions (Chamberlain, 2013; Coakley, 2011; Kelly, 2013; Perkins & Noam, 2007).

This dissertation yielded some insights into for whom sports-based interventions are most effective. The meta-analysis on the effect of physical activity interventions on internalizing problems showed larger effects in clinical samples and in samples with more females. In the study on the predictors of intervention success of AJB it was found that female participants reported greater improvements in prosocial behavior than did male participants. Finally, participants enrolled in special education reported greater improvements in several risk and protective factors for delinquency than participants enrolled in regular education. The findings of these studies suggest that sample characteristics could influence the effects of sports-based (crime prevention) programs. There are no previous studies on the influence of sample characteristics on the effectiveness of sports-based crime prevention. Ahn and Feweda (2011) found larger treatment effects of physical activity programs for youth in female and clinical samples on various psychological outcomes, which implicates that female adolescents and adolescents with more severe problems could possibly benefit the most from sports-based crime prevention. Possibly, this could be explained by the different etiology of problem behaviors in male and female adolescents (Cauffman, 2008). However, more research is needed to establish if these findings can be generalized to the broader practice of sports-based interventions.

Another conclusion that can be drawn from this dissertation is that to date, we do not fully understand *why* sports-based crime prevention programs could be effective. The theories that are most commonly mentioned as rationale for sports-based crime prevention are Hirschi's (1969) social bonding theory and the "sports build character"-theory (Rees, Howell, & Miracle, 1990). There is little evidence from previous studies that these theories adequately describe the mechanisms underlying the potential positive effects of sports-based crime prevention. For example, quality of the relationship with the coach did not contribute to intervention success of AJB in the fourth study, which is contrary to Hirschi's (1969) theory. In the third study, it was expected from the "sports build character"-assumption (Rees et al., 1990) that AJB, among other things, would positively affect the way that youth accept authority, decrease peer-related problems, and enhance prosocial behavior (Coakley, 2011; Donaldson & Ronan, 2006; Rutten et al., 2007; Shields & Bredemeier, 1995). However, we failed to find significant effects on the risk and protective factors of delinquency. Amongst the statistical and methodological explanations that have been mentioned in the third study, two other explanations are offered here.

First, we might not have measured all relevant outcome variables in the current study. For example, we did not take the level of moral judgment into account, a variable that is often mentioned in the sports for development research (Kavussanu & Ntoumanis, 2003; Shield & Bredemeier, 1995). Possibly, AJB may have increased the level of moral judgment of the participants, which in turn could decrease the risk for juvenile delinquency (Stams et al., 2006). On the other hand, there is much controversy on whether sports can increase moral judgment (Boardley & Kavussanu, 2011; Kavussanu & Ntoumanis, 2003; Shields & Bredemeier, 1995). Shields and Bredemeier (1995) concluded that youth tend to have less mature moral reasoning patterns when judging sports issues instead of moral situations in a daily life context. Therefore, it is not expected that increasing moral reasoning in the sports context can be generalized to the more broad, off-field contexts in which moral decision need to be made (Shields & Bredemeier, 1995).

Second, it is possible that the risk-oriented approach of the "sports build character"-theory does not adequately fit the sports context. This approach assumes that when risk and protective factors for delinquency are targeted, the risk for juvenile delinquency decreases (Farrington, 2007). Generally, sports-based crime prevention programs (including AJB) do not have well described strategies on *how* to target the risk and protective factors for delinquency in the sports context. Although it is easy to see that youth are confronted with authority, disappointment, and peer interactions in the sports context, turning these experiences into a learning experience needs more than just a confrontation with difficult situations. Again, it is expected that this depends largely on how well the coach succeeds in guiding the youth through these experiences (Coakley, 2011; Hartmann, 2003; Perkins & Noam, 2007). It is uncertain if coaches in sports-based interventions are skilled enough to

do so. Therefore, it is not guaranteed at all that the proposed risk and protective factors are indeed targeted in sports-based crime prevention programs.

Two alternative theories on the mechanisms underlying effective sports-based interventions for youth crime prevention are presented. First, sports-based crime prevention programs could adopt a theoretical framework using principles of the Good Lives Model (GLM; Ward & Brown, 2004). The GLM is a holistic, strengths-based approach, which assumes that all human beings seek for the fulfillment of primary human goods, such as healthy living, excellence in work and play, relatedness and community, and happiness (Ward & Brown, 2004). Moreover, the GLM assumes that enhancing personal fulfillment will naturally lead to reductions in risk factors, whereas a risk-oriented approach implies the opposite (Andrews, Bonta, & Wormith, 2011). If youth learn how to achieve these primary goods in a constructive, prosocial way, the chances of getting engaged in criminal behavior may be reduced (Ward & Brown, 2004). Notably, the principles from the GLM may be more closely related to the goals that are pursued in sports-based interventions than the principles of the risk-oriented approach. The healthy lifestyle that is pursued in sports, mastering sports skills, the relatedness with the team, the role models in the sport, the sports community as a whole, and the joy that arises from sports participation appear to fit the GLM-principles. Although the GLM assumptions have not (yet) been supported by a vast body of empirical evidence (Andrews et al., 2011), they might be a promising rationale for sports-based crime prevention.

The second alternative theory for the use of sports-based crime prevention programs that deserves further investigation is a neurobiological approach on sports-based interventions. When it comes to mental health and cognitive problems, the positive outcomes of sports and physical activity interventions are often attributed to the physiological effects of sports (Matta Mello Portugal et al., 2013; Singh et al., 2012). From previous research on antisocial behavior and juvenile delinquency we have learned that neurobiological mechanisms play a role in the etiology of these types of behaviors (Van Goozen & Fairchild, 2006). A reduced heart rate and lower levels of salivary alpha-amylase, cortisol, serotonin, and norepinephrine have been found to be related to antisocial behavior (De Vries-Bouw et al., 2011; De Vries-Bouw et al., 2012; Platje et al., 2013; Susman, 2006; Van Goozen & Fairchild, 2006). The associations between neurobiological markers and antisocial behavior have been explained by early stressful experiences (pre- and perinatal) that could have caused abnormalities in stress systems, which in turn is expressed in antisocial behaviors (Van Goozen & Fairchild, 2006). To date, research on the relation between neurobiological markers and antisocial behavior has not yielded clear implications for treatment so far (Cohn et al., 2015; Feilhauer, Cima, Korebrits, & Nicolson, 2013; Van Goozen & Fairchild, 2006). However, it seems interesting to test if sports participation, antisocial behaviors, and neurobiological markers are interrelated, and whether sports participation could have a therapeutic effect on the

neurological mechanisms underlying antisocial behavior (MacMahon, 1990). Physical activity has been known to influence several neurobiological markers associated with deviancy, including heart rate, cortisol, testosterone, serotonin, and norepinephrine levels (Chatterton, Vogelsohn, Lu, Ellman, & Hudgens, 1997; Ljungberg, Ericson, Ekblom, & Birkhed, 1997; Kenney, Wilmore, & Costill, 2015; Shaner et al., 2014). Subsequently, understanding neurobiological mechanisms underlying the complex, multifactorial relation between sports participation and juvenile delinquency could provide more insights into the effectiveness of sports-based crime prevention.

### **Strengths and limitations**

Considering the widespread practice of sports-based crime prevention, it is remarkable to notice how understudied this research area is (Chamberlain, 2013; Kelly, 2013). The current dissertation consists of literature studies on the relation between sports participation and juvenile delinquency and the effects of physical activity interventions on externalizing problems, internalizing problems, self-concept, and academic achievement in adolescents. Further, this dissertation includes a quasi-experimental study on the effectiveness of a Dutch sports-based crime prevention program, which assessed the predictors of intervention success of the program. The two literature studies were the first to synthesize the available empirical evidence on these topics. To our knowledge, the two studies on AJB were the first to assess the effectiveness of a sports-based crime prevention program (with a quasi-experimental design) and to examine the factors that may be associated with intervention success. Thus, a major strength of this dissertation is the theoretical and empirical contribution to the knowledge on sports-based interventions to prevent juvenile delinquency.

Apart from the limitations of the individual studies that have been mentioned in the previous chapters, this dissertation has some more general limitations. First, just because of the topic of the dissertation that is rather understudied, we need to be cautious about the generalization of the findings. One might question whether the interventions that were evaluated in the studies included in the meta-analyses on the effects of physical activity interventions and AJB were representative of the average sports-based intervention. Based on the current dissertation we cannot expect sports-based programs to produce positive effects on juvenile delinquency without further qualification. Although the current dissertation was an important step towards understanding the effectiveness of sports-based crime prevention, much more research is needed to understand if, why, for whom, and under which conditions sports-based interventions are effective in preventing juvenile delinquency.

As second limitation of this dissertation and of sports-based intervention research in general is that sports-based crime prevention does not constitute a well described

protocolled practice, which makes it harder to understand what is exactly researched (Coalter, 2015; Green & Glasgow, 2006; Gresham, 2004; Hohmann, & Shear, 2002; Nichols, 2007). It is unclear what is happening on the sports field, what kind of educational techniques are used by the coach to influence behavior, and what the educational policies are for dealing with problematic behaviors. Consequently, this may pose a threat to the external validity of the research. Nevertheless, sports-based interventions and experience-based interventions in general are embedded in the daily practice of a broad range of interventions promoting youth development. Therefore, it is valuable to test their effectiveness, while caution is needed in generalizing the effects of these types of interventions.

### **Future directions for research and practice**

The current dissertation highlighted the potential of sports-based crime prevention, but also emphasized that this is a rather understudied and underdeveloped area of scientific research and practice. Therefore, suggestions for future research and practice concerning sports-based crime prevention are discussed.

The first recommendation is that more quantitative research should be conducted to answer the questions *if*, *why*, *for whom*, and *under which conditions* sports-based crime prevention programs are effective. Concerning the *if*-question, the effectiveness should be assessed with the most robust experimental research designs, conducted by independent researchers using multiple sources of information. To understand *why* sports-based interventions can be effective in preventing juvenile delinquency, it is necessary to test multiple mediation models (Kazdin & Nock, 2003). For example, future research should consider operationalizing the four elements of Hirschi's (1969) social bonding theory, assessing multiple risk factors for delinquency (Farrington, 2007) as well as the primary goods from the Good Lives Model (Ward & Brown, 2004), and may even look at neurobiological markers (De Vries-Bouw et al., 2012). With regard to answering the question *for whom* sports-based interventions are most effective, unobserved subpopulations could be detected with growth mixture modeling (see for example Muthén et al., 2002). Finally, in order to learn more about the most optimal conditions of sports-based crime prevention, measures of the sports context and the behaviors of the coach should be included in future research. Measures of the sports context could be defined by behaviors of the coach, the socio-moral atmosphere of the environment, the quality of peer-interactions, the relationship between the youth and the coach, and sports characteristics, such as the type of sports and the setting of the sports activities (Coakley, 2011). Observations may be an informative way to assess the behaviors of the coach.

The findings of this dissertation have implications for the local practice of sports-based interventions to prevent juvenile delinquency. Foremost, the conclusion that sports by themselves are not enough to keep youth from crime implicates that the development and

implementation of sport-based interventions should be based on what is known about sports and crime prevention in scientific literature. It must be clear what the (expected) effective components of the intervention are, how a safe pedagogical sports climate is guaranteed, how negative peer-interactions can be prevented, what tools should be offered to make sure that coaches are equipped to adequately deal with at-risk youth, and how the implementation of the intervention is monitored (Coakley, 2011; Goense, Assink, Stams, Boendermaker, & Hoeve, 2016; Haudenhuyse, Theeboom, & Nols, 2012; Haudenhuyse, Theeboom, & Coalter, 2012; Perkins & Noam, 2007; Rutten et al., 2007). Below we will provide some suggestions for the development of sports-based crime prevention programs.

To design sports-based crime prevention programs with effective components, the literature on the effectiveness of youth crime prevention can be consulted. De Vries, Hoeve, Assink, Stams, and Asscher (2015) showed that crime prevention programs with elements of behavioral modeling, contracting, or parenting skills are more effective than programs that do not contain these elements. It may not be so obvious to address parenting skills in sports-based crime prevention programs, but possibly efforts should be made to increase supportive parental involvement (Cockburn, 2016). Additionally, the incorporation of behavioral modeling and contracting may be considered. The coach can act as a role model of prosocial behaviors (Fraser-Thomas, Côté & Deakin, 2005; Gano-Overway et al., 2009). Behavioral contracting is a procedure in which clear behavioral expectations are formulated, and rewards for adhering to the contract and consequences for breaking the contract are agreed upon (Bowman-Perrott, Burke, De Marin, Zhang, & Davis, 2015). If coaches are instructed to be models of prosocial behavior and to apply behavioral contracting techniques, these elements could be implemented in sports-based interventions. Additionally, to increase the chance that risk factors for juvenile delinquency are in fact targeted and the developmental outcomes of sports-based programs are achieved, the coach and the individual youth can set developmental goals that are frequently evaluated (Hansen, Larson, & Dworkin, 2003; Wilson, Gottfredson, & Najaka, 2001). The development of *Sport plus*-programs, "in which sports are adapted and augmented with parallel programs in order to maximize their potential to achieve developmental objectives" (Coalter, 2010, p. 298), may be encouraged.

The current dissertation and previous studies have highlighted the importance of a safe pedagogical sports environment (Ntoumanis, Taylor, & Thøgersen-Ntoumani, 2012; Perkins & Noam, 2007; Rutten et al., 2007; Smith, Smoll, & Cumming, 2007). Therefore, sports-based crime prevention programs should make sure that the quality of the pedagogical sports climate is high. Behavioral rules, goals, and expectancies of the sports environment should be very clear and known to everyone who participates, including athletes, coaches, parents, and volunteers (Perkins & Noam, 2007; Schipper-Van Veldhoven, Van der Palen, Van der Kerk, & Schuijers, 2012). The coach must be aware of the implicit signals that they give about

the norms and values in the sports context. It is important that they give attention to all youth (not only the talented ones), to create exercises in which all youth can succeed in any way, and to discuss disrespecting behaviors (Gano-Overway et al., 2009; Haudenhuyse, Theeboom, Coalter, 2012; Hilhorst, Schipper-Van Veldhoven, Jacobs, Theeboom, & Steenbergen, 2014; Schipper-Van Veldhoven et al., 2012). A motivational, caring climate in which youth are welcomed and accepted for who they are as a person, while winning is not the most important aspect of the game (Gano-Overway et al., 2009; Ntoumanis, Taylor, & Thøgersen-Ntoumani, 2012; Rutten et al., 2007), needs to be the norm in sports-based crime prevention. To meet the standards of a safe pedagogical sports environment, interventions aimed at improving the sports climate can be used (Mouratidou, Goutza, & Chatzopoulos, 2007; Newton et al., 2007; Rutten et al., 2010).

In addition to the measures that guarantee a safe pedagogical sports environment, it is important to make a few extra efforts to prevent negative peer interactions. The risk of deviancy training is particularly high in unstructured, unsupervised moments (Dishion & Tipsord, 2011). In the development of the sports-based crime prevention programs it is therefore relevant to minimize unstructured and unsupervised moments, such as youth waiting for the dressing rooms to open and hanging around after practice. More and more, the online social media environment (such as team chats) plays a role in deviancy training (Dishion, 2014). To prevent deviancy training, there should be enough coaches available in order to prevent unstructured and unsupervised moments, and coaches should be interested in the group processes that take place online.

As coaches play a major role in determining whether the sport-based crime prevention programs are effective, it is important to support the coach in dealing adequately with the behaviors of at-risk youth. The coach should be educated, skilled, and confident about their abilities to stimulate positive development in youth (Côté & Gilbert, 2009). Therefore, in developing sports-based crime prevention programs specific attention should be directed towards tools that support coaches in their practices. For example, training focusing on learning educational and behavioral techniques (e.g., behavioral contracting, behavioral modeling, and goal setting) could be developed and offered to all coaches. Further, supervision by a behavioral expert and peer-supervision (sometimes designated as intervision) groups can be organized, in which coaches can share their experiences and best practices (De Lange & Chênevert, 2009).

Finally, it is important that the intervention be delivered as intended, which is referred to as the program integrity of the intervention (Goense et al., 2016). Program integrity consists of two aspects: therapist adherence and therapist competence. Therapist adherence is the level in which the therapist (or coach) delivers intervention components in adherence with the intervention manual. Therapist competence can be described as the therapist's (or coaches) skills and judgements in delivering the intervention components (Goense et al.,

2016). High program integrity is related to larger effects in evidence-based interventions (Goense et al., 2016). Therefore, to guarantee the quality of the intervention and to maximize the potential of sports-based interventions, it is important that the implementation of interventions be monitored (Gearing et al., 2011).

## Conclusions

The current dissertation provided important conclusions on the effectiveness of sports-based interventions to prevent juvenile delinquency. From the current dissertation it can be learned that sports-based crime prevention programs could have a potential to effectively prevent youth from developing delinquent behaviors. However, it is concluded that it is not sports activities themselves that can lead to positive developmental outcomes. Sports-based interventions may be perceived as non-stigmatizing and fun ways to reach those youth who are generally hard to reach, and as a vehicle for positive youth development. In order to be effective, sports-based crime prevention programs have to meet conditions concerning the quality of the sports environment and the behaviors of the coach. Therefore, sports-based crime prevention programs should be carefully designed. Finally, the current dissertation demonstrated a general lack of scientific involvement in sports-based crime prevention programs, and advocates high quality research on the effectiveness of these programs for at-risk youth.