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The way to success: Identifying factors related to individual differences in behavioral control and prosocial behavior

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Citation

Vrijhof, C. I. (2018, February 28). *The way to success: Identifying factors related to individual differences in behavioral control and prosocial behavior*. Retrieved from <https://hdl.handle.net/1887/61151>

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Issue Date: 2018-02-28

CHAPTER 5

General discussion

The general aim of the studies presented in the current thesis was the identification of correlates of two key factors for success: behavioral control and prosocial behavior, a hallmark of social competence. We assessed four different types of children's behavioral control (Chapter 2 and 3): parent-reported effortful control, observed cheating behavior, delay of gratification and response inhibition. For prosocial behavior, one type was assessed (Chapter 4): observed compensating behavior towards an excluded peer. Potential correlates were categorized as characteristics of the child, factors in the child's social environment, or factors in the child's physical or socioeconomic environment. In Chapter 2 we focused on relations between factors in the social and physical environment on the one hand and children's effortful control and their cheating behavior on the other hand. The results indicate that individual differences in effortful control were associated with factors in the social environment, whereas differences in cheating behavior were related to factors in the physical environment. Child characteristics and the socioeconomic environment show potential relations with individual differences in both effortful control and cheating behavior. In Chapter 3, relations between factors in the social environment and children's delay of gratification and response inhibition were examined. Evidence for such relations was found for both types of behavioral control. Furthermore, we found that child characteristics were only related to individual differences in response inhibition and that the socioeconomic environment was not related to either delay of gratification or response inhibition. A visual overview of the main results for behavioral control can be found in Figure 1a. Finally, in Chapter 4, we tested relations between adolescents' prosocial behavior, child characteristics, and factors in the social environment of the child on the other hand. We found evidence for some relations in both domains. A visual overview of the main results for prosocial behavior can be found in Figure 1b. In the following sections, the findings will be discussed in more detail.

a

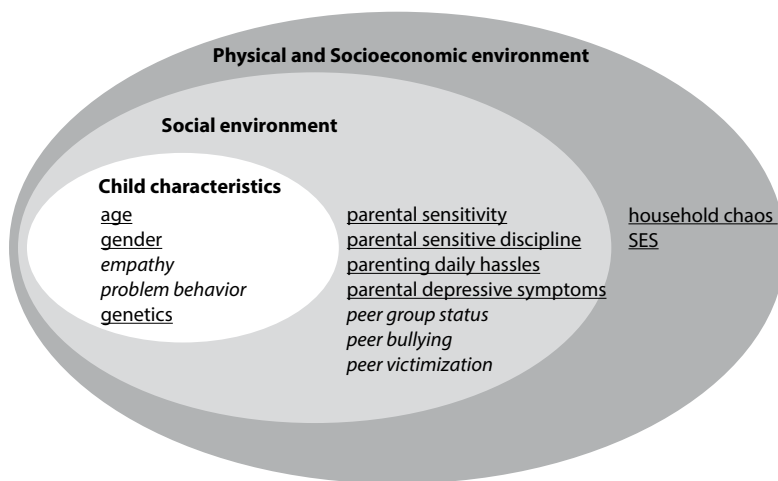


Figure 1a. Results of the current thesis regarding children's behavioral control. Child characteristics and factors in the social, physical, and socioeconomic environment that were significantly related to children's behavioral control are underlined. Factors in a regular font style were not significantly related to children's behavioral control. Factors that were not tested are in italics.

b

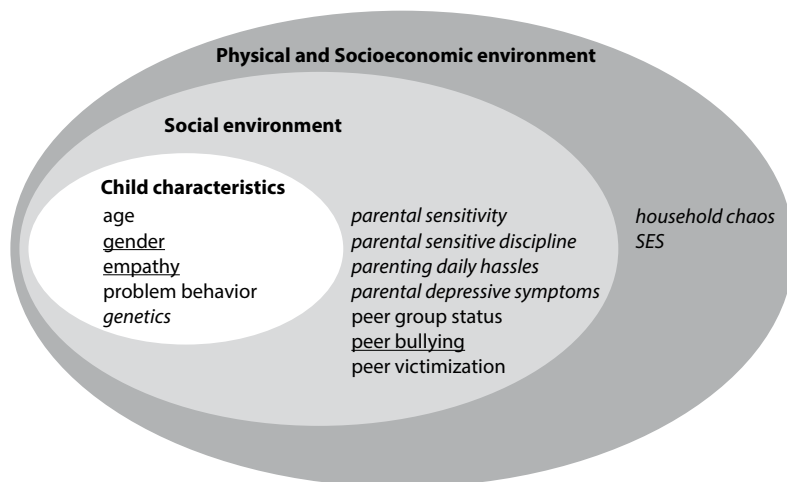


Figure 1b. Results of the current thesis regarding adolescents' prosocial behavior. Child characteristics and factors in the social, physical, and socioeconomic environment that were significantly related to adolescents' prosocial behavior are underlined. Factors in a regular font style were not significantly related to adolescents' prosocial behavior. Factors that were not tested are in italics.

Child characteristics

First of all, relations between child characteristics and individual differences in children's behavioral control (Chapter 2 and 3) and adolescents' prosocial behavior (Chapter 4) were examined. With regard to child age, we only found evidence for an association with behavioral control, not prosocial behavior. We found a positive effect of age on children's response inhibition: older children showed better response inhibition (Chapter 3). In addition, Chapter 2 showed a positive effect of age on children's cheating behavior, which was categorized into three groups: a cheating group, a possible intention to cheat group and a group that did not cheat. Results showed that older children had a higher chance of being in the possible intention to cheat group compared to the cheating group, indicating that older children cheated less. This relation was, however, only found in the test sample and could not be replicated. We speculate that children in the possible intention to cheat group might be considered as children with the highest levels of behavioral control, since they may have been more tempted than children who did not cheat, but resisted this temptation anyway. The fact that we did not find an effect of age on prosocial behavior in early- to mid-adolescents was not in line with our expectations based on previous studies (Chapter 4). It has been shown, however, that prosocial behavior, like behavioral control, is a multidimensional construct and that different dimensions of prosocial behavior are differentially related to child characteristics like child age (Carlo & Randall, 2002; Padilla-Walker & Carlo, 2014). This might explain the lack of an age effect on prosocial compensating behavior. The only other study investigating prosocial compensating behavior in adolescents using a sample of 10- to 15-year-old boys did not find an age effect either (Howard, Landau, & Pryor, 2014).

Child gender was found to be related to both behavioral control and prosocial behavior. With respect to children's behavioral control, we found that girls outperformed boys on response inhibition (Chapter 3). In addition, results from Chapter 2 suggest that girls cheated less than boys, since they had a higher chance of being in the no cheating or possible intention to cheat group than the cheating group. It should be noted however, that this relation could not be replicated in another part of the sample. A possible explanation for this gender difference could be that girls are better in controlling their behavior than boys because of genetic differences, but it could also be that girls elicit a more optimal social environment,

which in turn promotes the development of behavioral control. In Chapter 3, for example, we found that parents of girls disciplined their child more sensitively, which is in line with the results by Kok et al. (2014). For prosocial behavior, we found some evidence indicating that adolescent boys compensated more for the social exclusion of an ingroup member, but not of an outgroup member compared to adolescent girls (Chapter 4). This effect is in the opposite direction of our expectation. It should be noted, however, that we examined gender differences in prosocial behavior using two different statistical analyses and that the other analysis did not show any gender differences. As described in Chapter 4, gender effects on prosocial behavior have been found to vary among different dimensions of prosocial behavior, just like age effects (Fabes & Eisenberg, 1998). In a social exclusion situation gender effects may be reversed since girls tend to score higher on relational bullying than boys (Ostrov & Crick, 2007; Wang, Iannotti, & Nansel, 2009). As a result, girls might be more likely to go along with the excluders and thus compensate less for the exclusion of a peer compared to boys.

In Chapters 2 and 3 we examined the relative influence of genetic factors on individual differences in behavioral control. We found evidence for small (16%) to moderate (31%) genetic contributions to individual differences in children's cheating behavior and parent-reported effortful control respectively (Chapter 2), but not to individual differences in delay of gratification and response inhibition (Chapter 3). For all four types of behavioral control, most of the variance in individual levels was explained by unique environmental factors and/or measurement error. Speculatively, genetic contributions to children's behavioral control might have been smaller than expected because of the young age of the children included in our studies. There is evidence that genetic contributions to individual differences in for example cognitive abilities and impulsivity become larger when individuals grow older (Anokhin, Golosheykin, Grant, & Heath, 2011; Anokhin, Grant, Mulligan, & Heath, 2015; Briley & Tucker-Drob, 2013).

With regard to relations between prosocial behavior and personality characteristics of early- to mid-adolescents, we found that children with higher levels of empathic concern compensated more for the social exclusion of an ingroup member (Chapter 4). It should be noted, however, that empathic concern was related to prosocial

behavior on a trend level only. Individual differences in prosocial behavior were not related to levels of perspective taking and internalizing and externalizing problem behavior (Chapter 4). Interestingly, empathic concern, perspective taking, and externalizing problem behavior were significantly related to self-reported prosocial behavior (r 's are .49, .53, and -.26 respectively). However, self-reported prosocial behavior was not significantly related to observed prosocial compensating behavior. Speculatively, social desirability might have played a role. In our opinion, these results show the importance of assessing what individuals actually do and not what they say they do.

Social environment

Next to child characteristics, we also examined relations between factors in the social environment of children and individual differences in behavioral control and prosocial behavior. The results of Chapter 2 indicate that children of parents who experienced more parenting daily hassles and more depressive symptoms had lower levels of effortful control compared to children of parents who experienced low levels of parenting stress and depressive symptoms. Surprisingly, only the level of depressive symptoms reported by the other parent, who was the biological father in most cases, and not the level reported by the primary parent, who was the biological mother in most cases, was related to children's effortful control. Speculatively, the effect of depressive symptoms of the primary parent is overshadowed by the level of parenting daily hassles, which was also reported by the primary parent, since individuals who reported more parenting daily hassles also reported more depressive symptoms. Another unexpected finding was that no relations were found between children's cheating behavior on the one hand and parenting daily hassles, and parental depressive symptoms of the primary and the other parent on the other hand. Most studies on the effects of parenting daily hassles and parental depressive symptoms on children's behavioral control, however, used parent-report measures for children's behavioral control, whereas in our study cheating was observed. Parent-reports usually include a range of behaviors observed by parents over a longer period of time, which might lead to more variation in individual levels than a single observation in a specific situation, especially when behavior is categorized in one of three categories. Furthermore, it could be that parents who experience more stress or depressive symptoms report more negatively on their child's behavior, leading to an overestimation of the effect,

at least when only one parent reports on the behavior of the child, which was not the case in the current study.

As we explained in the general introduction, the relation between parenting daily hassles and children's behavioral control, as well as the relation between parental depressive symptoms and children's behavioral control, might be at least partly mediated by the quality of parenting practices (Crnic, Gaze, & Hoffman, 2005; Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Indeed, we found that children of primary parents who showed more sensitive discipline practices towards their child, had higher levels of delay of gratification and response inhibition one year later. These relations were found to be significant even when controlled for parental sensitivity in a structured play situation (Chapter 3). One explanation for the relation between parental sensitive discipline and children's delay of gratification is that children of parents who use active distraction during a don't touch task, may have internalized the ability to distract themselves (Houck & LeCuyer-Maus, 2004), which in turn helped them to successfully delay gratification in the marshmallow test (Mischel, 2014). For now, the mechanisms underlying the relation between parental sensitive discipline and children's response inhibition remain unclear. Parental sensitivity in the structured play situation contributed only uniquely to the prediction of children's response inhibition (Chapter 3), as we expected. Children of parents that were more sensitive to them during play were better able to inhibit their reactions than children of less sensitive parents. It has been suggested that the effect of sensitivity on children's behavioral control might be mediated by attachment security (Bernier, Carlson, Deschenes, & Matte-Gagne, 2012). Parental sensitivity is a documented predictor of attachment security and recent research suggest that attachment security provides a base for the optimal development of behavioral control (Dindo et al., 2017).

As children grow older, their social environment expands and the importance of relations with peers increases. When examining differences in individual levels of adolescents' prosocial behavior, we therefore focused on characteristics of (relations with) peers in stead of parents. The results of Chapter 4 indicated that early to mid-adolescents compensated equally for the exclusion of ingroup and outgroup members in the Prosocial Cyberball Game. Generally, people have been found to

be more prosocial towards individuals who belong to the same group as themselves, compared to individuals belonging to another group (Baldassarri & Grossman, 2013; Balliet, Wu, & De Dreu, 2014). As we discussed in Chapter 4, it might be that our manipulation was too subtle. In the ingroup condition, the excluded player had the same color as the participant, whereas the excluded player in the outgroup condition had a different color than the participant. We did not inform the participants about the meaning of the colors. The effect of peer group status might have been stronger when groups would have been created using characteristics that are more salient for the participant. Previous studies that found effects of group status on prosocial behavior used for example sexual orientation or cultural background (Sturmer, Snyder, Kropp, & Siem, 2006; Sturmer, Snyder, & Omoto, 2005).

The results of Chapter 4 indicate also that prosocial behavior was not related to experiences of the adolescents with being bullied themselves. Experiences of the participants with bullying others, however, were related to prosocial behavior: adolescents who reported more bullying showed less prosocial compensating behavior towards the excluded peer than adolescents who reported lower levels of bullying. This was only true, however, for outgroup but not for ingroup members. Adolescents who did not compensate for the social exclusion either did not change their behavior towards the excluded peer at all, or even decreased the number of tosses, thereby joining the excluders. This could be categorized as bullying, explaining the negative association that we found.

Physical and socioeconomic environment

In addition to child characteristics and factors in the social environment of children, we also examined factors in the physical and socioeconomic environment of the child in the current thesis. Chapter 2 showed that the level of household chaos reported by the primary parent was associated with children's cheating behavior: children growing up in more chaotic households had an increased risk of being in the cheating group versus the possible intention to cheat group. Speculatively, children growing up in a more chaotic home environment are monitored less, which might in turn influence children's moral development negatively. Children's cheating behavior might be viewed as an indicator of children's moral development rather than as a type of behavioral control. Surprisingly, household chaos was not related to

parent-reported effortful control. It could be that the effect of household chaos on children's effortful control was overshadowed by the effects of the level of depressive symptoms of the other parent and, in particular, the level of parenting daily hassles as reported by the primary parent. After all, we found that individuals in more chaotic households reported more depressive symptoms and parenting daily hassles. Effects of household chaos on children's behavioral control might thus be partly confounded with parenting daily hassles, indicating that the stress associated with living in a chaotic environment, as experienced by parents, is more important for the prediction of individual levels of effortful control than the level of household chaos itself. For cheating behavior, the opposite seems to be true. Observed indicators of household chaos, i.e. noise levels and crowding, were not related to any of the behavioral control measures. Possibly, other indicators of household chaos like a lack of structure and routines are more important than noise and crowding.

With regard to the socioeconomic environment we found that children growing up in families with a lower SES showed less effortful control and cheated more compared to children growing up in families with a higher SES (Chapter 2). However, these relations could not be replicated in another part of the sample. Chapter 3 showed that SES was not related to individual differences in delay of gratification and response inhibition (Chapter 3). It might be that SES is only indirectly related to children's behavioral control via factors in the social and physical relation of the child. The results of the studies in the current thesis showed for example that a lower SES was related to more parental depression, parenting daily hassles, and household chaos, and less parental sensitivity and parental sensitive discipline, factors that were in turn related to children's behavioral control.

Methodological strengths and limitations

When interpreting the findings reported in the current thesis, there are some methodological limitations and strengths that should be taken into account. First, the majority of the correlates we examined in Chapter 2 and 4 were measured using questionnaires. The answers of the participants may have been biased by social desirability, considering the sensitive nature of some of the questionnaires. Participants might have presented a more favorable picture of themselves by reporting for example less depressive symptoms, parenting daily hassles, bullying, or problem behavior. We

should note, however, that the questionnaires were generally completed online and were always anonymous, which has been found to produce lower levels of social desirability than non-anonymous and paper-and-pencil questionnaires (Joinson, 1999). Furthermore, all questionnaires are often used and proven to be reliable and valid, and in Chapter 2, we screened participants' answers for reporter bias using a selection of items from the Wildman Symptoms Checklist. Ideally, we would have assessed the correlates in Chapters 2 and 4 in a more objective way, but we had to make concessions, since there are limits to our financial resources and to the time participants are willing to invest in the study. With regard to the correlates we chose to invest more in a selective set of factors, including parental sensitivity and sensitive discipline (Chapter 3) as well as noise levels and crowding (Chapter 4). Furthermore we invested in the development of behavioral assessments of the central outcome measures: behavioral control and prosocial behavior. We believe it is important to include observational measures because they assess actual behavior instead of a perception of someone's (own) behavior. Moreover, the tasks we used focus on specific types of behavioral control and prosocial behavior, whereas questionnaires generally cover multiple dimensions of these multidimensional constructs. As we mentioned, different types of behavioral control as well as different types of prosocial behavior are often only moderately related (Carlo & Randall, 2002; Duckworth & Kern, 2011) and may be associated with different factors. It is, therefore, important to assess different types separately.

Another limitation is the correlational design of the studies. For all studies, we cannot exclude the possibility that the direction of the effects is in the opposite direction. Children with higher levels of behavioral control could elicit for example more sensitive parenting and less parenting daily hassles. Causality and direction of effects can only be demonstrated using an experimental design. Although less certain, a longitudinal design in which bidirectional effects are examined can also shed some light on the direction of effects. In time, these analyses will be possible within the sample of L-CID, but for the current thesis data for these analyses was not yet available. One of the strong aspects of the design in all studies is the inclusion of multiple, theoretically related correlates within the same model. By including multiple factors in the same model, we were able to investigate the association(s) between a specific predictor and the outcome measure(s) over and above the other

factors. This is more informative than assessing these relations separately, because it indicates which factors are most important.

Another strength we would like to highlight is the inclusion of twins in the studies described in Chapter 2 and 3. By using twins, we can investigate the relative influence of genetic, shared environmental, and unique environmental (also including measurement error) factors on children's behavioral control, while we try to identify some of the shared and unique environmental factors that can explain these influences. Furthermore, the twin design can be used to create two groups that resemble each other very well. This procedure allowed us to test a specific model in one group and then test the same model in the other sample. If the results in the first group can be replicated in the second group, the findings may be considered replicable under ideal circumstances, i.e., highly similar twin sub-samples. Within science, replication is essential (Simons, 2014). However, a study focusing on psychology publications since 1900 found an overall replication rate of only 1.07% (Makel, Plucker, & Hegarty, 2012). This shows the need for more replication studies, of which the study in Chapter 2 is an example. The inclusion of twins, however, also has a drawback: it limits the generalizability of the results presented in Chapter 2 and 3 to families with only one child or non-twin siblings. However, a previous study by Robbers et al. (2010), showed that the development of twins with respect to externalizing behavior resembles the development of singletons, suggesting that these groups might not be so different after all. Furthermore, the results of our studies cannot be transferred one-on-one to families with opposite sex twins, since we only included same-sex twins.

Another aspect limiting the generalizability of the results is the distribution of SES within our sample. About 7% of the families who decided to participate in L-CID had a low SES background. Families were classified as low SES if no more than one of the parents finished an intermediate vocational education, pre-university education, or higher general secondary education. If both parents finished a higher vocational education or university the family was classified as high SES (55%) and all other families were classified as middle SES. In the general Dutch population of 2014, the year we started to recruit families, 10% of the adults over 25 finished primary school only, 20% completed a lower vocational education, 39% completed an intermediate

vocational education, pre-university education, or higher general secondary education and 30% finished a higher vocational education or university (Rijksinstituut voor Volksgezondheid en Milieu). Although the educational level of both parents was used to assess family SES within Samen Uniek, it seems that low SES families are underrepresented in our sample and high SES families are overrepresented, which limits the generalizability of the results to the Dutch population as a whole.

A final strong aspect we would like to highlight is the relatively large sample size in all of the studies in the current thesis. A twin design, which was used in both Chapter 2 and 3, can be challenging, especially when only same-sex twins with a European background and within a specific age range are targeted. In addition, the study design is longitudinal in nature and includes an intervention phase, which potential participants might find too demanding. Despite these challenges, we were able to include 238 families at the start of the study.

Theoretical implications

The modest effect sizes we found in the current studies indicate that there are also other factors that can explain individual differences in behavioral control and prosocial behavior than those examined in the current thesis. More research is needed to identify these factors, especially for prosocial behavior in a social exclusion situation. Moreover, results from Chapter 2 and 3 showed that genetic influences within the preschool period are at best small to moderate in size and that the relative influence of genetic effects varies among different dimensions of behavioral control. Most variance in behavioral control during the preschool period was explained by unique environmental effects, but shared environmental effects were also found. We tried to identify some of the shared and unique environmental factors related to children's behavioral control and found factors in especially the social environment, but also children's physical and socioeconomic environment, to be important. Considering the large unique environmental effects, it seems to be especially important to identify more unique environmental factors contributing to individual differences in behavioral control in future studies.

Furthermore, the results of the studies in the current thesis confirm the multidimensional nature of children's behavioral control and prosocial behavior.

Correlations between different dimensions of the same construct were generally significant but weak. Chapter 2 showed that children in the cheating group had significantly lower scores on effortful control than children in the possible intention to cheat group, but the correlation was rather small ($r = .16$) and, more importantly, could not be replicated. The correlation between children's delay of gratification and response inhibition was also significant, but again rather small ($r = .15$, Chapter 3). For prosocial behavior, no significant relation between self-reported prosocial behavior and compensating behavior in the Prosocial Cyberball Game was found (Chapter 4). We therefore suggest that a multimethod approach, i.e., including multiple tasks or a combination of tasks and questionnaires within one study, as we did in the current thesis, is the best approach when examining individual differences in behavioral control and prosocial behavior. Furthermore, given the different antecedents for the different dimensions of behavioral control and prosocial behavior, we believe that it is most informative to study the different dimensions separately instead of aggregating data in order to create an overall behavioral control or prosocial behavior score. In addition, recent studies showed that different dimensions of behavioral control are differentially related to later child outcomes such as externalizing problem behavior and academic performance (Kim, Nordling, Yoon, Boldt, & Kochanska, 2013; Willoughby, Kupersmidt, Voegler-Lee, & Bryant, 2011), which underlines the importance of studying different dimensions of behavioral control separately.

Finally, the studies presented in the current thesis showed that the tasks we used to measure behavioral control and prosocial behavior reveal individual differences that are related in a meaningful way to (known) predictors. These tasks may thus be used in other studies as well. To our knowledge, we were one of the first to successfully use a stop-signal task in 4-year-old children. We were also among the first to examine prosocial behavior in a social exclusion situation in early to mid-adolescents. Most studies focused on college students, and the one study that did focus on adolescents only included boys (Howard, Landau, & Pryor, 2014).

Practical implications

Considering the major developmental steps that are taken during the preschool period in behavioral control and the fact that higher levels of behavioral control early in life are an important predictor to more favorable outcomes later in life,

it seems important to monitor children's behavioral control closely during this age period. When behavioral control levels are low, we could try to promote children's self-regulatory skills by stimulating for example parental sensitivity and sensitive discipline and reducing parental stress, depressive symptoms, and household chaos. Although we don't know yet how individual differences in adolescents' prosocial behavior can be explained, we do know now that the Prosocial Cyberball Game may be used to objectively assess prosocial behavior in a social exclusion situation. When trying to decide which children need help improving their prosocial skills, this game might be part of a screening instrument for prosocial behavior. Perhaps the Prosocial Cyberball Game might also be part of a screening instrument for antisocial behavior in social exclusion situations, identifying children that may be (at risk for) bullying their peers.

Concluding remarks

The current thesis shows that there is quite some variation in the level of children's behavioral control as well as in the level of adolescents' prosocial behavior and that these levels can be related to child characteristics, factors in their social environment, and their physical and socioeconomic environment in a meaningful way. Furthermore, the studies in the current thesis underline the importance of treating both behavioral control and prosocial behavior as multidimensional concepts. Moreover, the results of the current thesis indicate that different types of behavioral control might be differentially related to child characteristics and factors in their social, physical and socioeconomic environment. Since previous studies showed that different types of behavioral control are in turn differentially related to child outcomes like academic performance and problem behavior, we think it is important to study which specific factors are related to individual differences in specific types of behavioral control. This might also be true for prosocial behavior, since this is also a multidimensional construct. The multidimensionality of behavioral control and prosocial behavior may be taken into account when designing intervention programs that aim to improve a specific dimension of one of these constructs by targeting only the factors that are uniquely associated with that dimension of behavioral control or prosocial behavior.