

STUDY TITLE:

PREVENTION OF DEPRESSION AND BULLYING IN ADOLESCENTS BY MEANS OF AN
INTERVENTION BASED ON IMPLICIT THEORIES OF PERSONALITY

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I. BACKGROUND

Depression and aggressive behavior are psychological problems of crucial clinical and social relevance. According to data from the World Health Organization (WHO, 2012), more than 350 million people suffer from major depressive disorder, which constitutes one of the most important causes of disability. Depression involves great suffering in people, contributing to significant difficulties in their social, academic, and professional life. There is a dramatic increase of depression rates in adolescence. Moreover, depression in adolescence is the most powerful predictor of experiencing depression in adulthood. On the other hand, aggressive behavior is also highly prevalent in our society. Often arises early but increases in severity over time. As children enter adolescence aggressions towards peers give way to other modalities such as dating violence and violence against parents. Therefore, preventing the development of depression and aggressive behavior in childhood and adolescence is invaluable. Unfortunately, although there are adequate interventions for adolescents at risk of depression, results for the majority of the previous universal interventions have been poor. In the case of aggressive behavior current preventive interventions are expensive in terms of duration and involve working with children, their parents, and educators.

The current study will test the efficacy of an Implicit Theory of Personality (ITP) intervention, which has provided excellent results in US both for depression and externalizing problems such as aggressive behavior. Therefore, this study aims to extend this intervention to Spanish adolescents to replicate findings and at the same time adds several new innovative goals. This is the first investigation that will examine the efficacy of a preventive intervention from a transactional perspective. Therefore, the project will test the effects of the ITP intervention in the recursive associations among stressors, cognitive vulnerabilities, and psychological problems. In addition, we will evaluate at which developmental stage the intervention is more effective. Finally, we will examine the moderation role of previous risks. The project includes multiple sources of information: self-reports, parent-reports, biological data and psychophysiological measures. Therefore, the project will contribute from a biopsychosocial and interdisciplinary perspective to the development of universal preventive interventions for depression and aggressive behavior, two important psychological problems in modern societies.

I.1. Development of depression

Rates of depression increase considerably during adolescence (Avenevoli, Knight, Kessler, & Merikangas, 2008). Results from some studies indicate that rates of severe depressive symptoms in Spanish adolescents are high (Fonseca-Pedrero et al., 2011). Moreover, rates of depression are considerably higher in female than in male adolescents. Depressive symptoms are highly stable over time and experiencing a

depressive episode during the adolescence is a strong predictor of depression in adulthood (Rutter, Kim-Cohen, & Maughan, 2006).

Cognitive models of depression propose that certain negative cognitive styles act as vulnerability factors for depression, particularly when interacting with negative life events. Beck's model of cognitive therapy (Beck, 1983) and the hopelessness theory (Abramson, Metalsky, & Alloy, 1989) are two of the most influential models to explain the development and maintenance of depression. These models include elements that change significantly during adolescence. On the one hand, cognitive styles tend to consolidate in adolescence (Hankin, 2008). On the other hand, adolescents have to cope with an increasing number of complex life events (Rudolph et al., 2000), particularly in their interpersonal relationships (e.g., feeling pressure by friends and breaking up with boy/girlfriend).

According to Beck's model, cognitive vulnerability to depression consists of cognitive schemas involving dysfunctional beliefs about the world, relationships with others and oneself (Beck, 1983). Previous longitudinal studies have indicated that certain schemas are predictive of depressive symptoms (Calvete, 2014; Calvete, Orue, & Hankin, 2013; Roelofs, Lee, Ruijten, & Lobbestael, 2011). These include schemas involving the expectation that one's needs for acceptance and respect will not be fulfilled in a predictable way, and expectations about oneself and the environment that interfere with one's perceived capacity to perform successfully.

According to the hopelessness theory (Abramson et al., 1989), the depressogenic vulnerability style consists of negative inferences that include the tendency to attribute negative events to internal, global, and stable causes, the tendency to perceive negative events as having important negative consequences that will affect many areas of one's life, and the tendency to draw negative inferences about the self, following negative events. Several prospective studies have provided support for this theory in children and adolescents including studies conducted in our laboratory (e.g., Calvete, Cámara, Estévez, & Villardón, 2011; Calvete et al., 2013).

Recently, new models about the interplay between vulnerabilities, risk factors and psychological problems have been developed. In these models, variables are "recursive", such that variables can serve both as an antecedent and as an outcome (Hankin, Snyder, & Gulley, 2016). Two of these models are the transactional cognitive vulnerability to stress model (Hankin & Abramson, 2001) and the developmental cascade model (Masten et al., 2005). They extend the traditional diathesis-stress model by adding the idea that the relationships between cognitive vulnerabilities, symptoms and stressors are dynamic and bidirectional. In summary, these models suggest that stressors and negative cognitive styles increase the likelihood of experiencing depressive symptoms and that once levels of depression increase, these in turn increase the likelihood of new stressors and worsen cognitive vulnerabilities,

which in a cascade effect, can increase the risk of depressive symptoms and episodes over time. Thus, all these mechanisms can contribute to produce a snowball or cascade effect throughout adolescence, a developmental period where each stressor, cognitive risks, and depression all exhibit substantial changes (Hankin & Abramson, 2001; Masten et al., 2005). However, whereas an impressive number of studies have demonstrated unidirectional relationships from environmental stressors and cognitive vulnerabilities to depressive symptoms, relatively few studies have examined other alternative paths among these variables. Two alternative paths are relevant in this context: the stress generation and the worsening of cognitive vulnerabilities.

Specifically, the stress generation hypothesis (Hammen, 1991) was proposed to explain how depressed individuals may contribute to the generation of additional stress in their lives and, as a consequence, perpetuate depression. The stress generation has been supported in children and adolescents (e.g., Calvete, 2011; Calvete et al., 2013; Shapero, Hankin, & Barrocas, 2013). Another mechanism refers to the influence of depressive symptoms and stressors in the worsening of cognitive vulnerabilities. A growing body of studies with adolescents has indicated that depressive symptoms and stressful circumstances predict a worsening of cognitive vulnerabilities, such as negative inferences (Calvete, 2011; Garber, Keiley & Martin, 2002; McCarty, Stoep, & McCauley, 2007; Mezulis, Funasaki, Charbonneau, & Hyde, 2011) and cognitive schemas (e.g., Calvete et al., 2013). Thus, for instance, an adolescent who experiences depression may develop a hopeless view of the world and his/her future. Moreover, some symptoms of depression, such as lack of attention and motivation, may lead to school failure, which in turn can lead to a negative view of oneself.

1.2. Development of aggressive behavior

In the last years the rates of aggressive and antisocial behavior have increased in frequency and severity among children and adolescents (Connor, 2012). Although aggressive behavior decreases from childhood to adolescence, more serious forms of violence and deviant behavior tend to peak during this period (Dodge, Coie, & Lynam, 2006). Therefore, adolescence is a period with increased danger of violence and deviant behavior. Furthermore, new forms of aggression (e.g., through new technologies) have emerged and have generated a great deal of attention. Besides, aggressive behavior is persistent over time and predicts later antisocial behavior (Farrington, 2007), thus it is very important to implement preventive interventions at childhood and adolescence.

Aggressive behavior is a complex phenomenon influenced by several factors (Dodge & Pettit, 2003). Among those factors, social cognitions have a crucial role in the moments immediately preceding the enactment of an aggression (Anderson & Bushman, 2002). The theory that focuses on the sequential steps in social information

processing (SIP; Dodge, 1986; Crick & Dodge, 1994) has revealed the important role of hostile attribution biases in ambiguous situations as antecedents of aggressive behavior (Helfritz-Sinville & Stanford, 2014; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Moreover, these biases are guided by deeper cognitive schemas. Cognitive schemas relevant for aggression include justification of violence beliefs (Calvete, 2008; Guerra, Williams, & Sadek, 2011; Wright & Li, 2013) and the narcissism or grandiosity schema (Lobbestael, Baumeister, Fiebig, & Eckel, 2014). A number of longitudinal studies have shown that these schemas predict aggressive behavior over time (Calvete, 2008; Fanti & Henrich, 2014).

As mentioned above, recent research suggests that the associations among cognition, emotion, and behavior are rarely unidirectional; rather, they are elements that influence one another. Therefore, cognitive vulnerabilities may predict an increase in aggressive behavior, yet the execution of this aggressive behavior may in turn lead to a strengthening of aggressive cognitive and emotional processing. Although there is theoretical support for these transactional associations among cognitions and aggressive behavior (Anderson & Huesmann, 2003), research has been scarce and only recently a number of studies have examined these associations providing preliminary evidence (Calvete, Gámez-Guadix, & García-Salvador, 2015; Calvete, Orue, Gámez-Guadix, & López de Arroyabe, 2014; Fontaine, Yang, Dodge, Bates, & Pettit, 2008).

1.3. Preventive approaches to depression and aggressive behavior

Several depression prevention programs have been developed, such as the Coping with Stress program (Clarke et al., 1995), the Blues Program (Stice, Burton, Bearman, & Rohde, 2007), the UK Resilience Program (Challen, Machin, & Gillham, 2014), and the Penn Resiliency Program (Cardemil, Reivich, Beevers, Seligman, & James, 2006). Most prevention programs have targeted factors that have been found to increase risk for future onset of depression or increases in depressive symptoms, such as negative cognitions, social skill deficits, and ruminative style. The results from meta-analytic reviews of the effects of depression prevention programs for youth indicate that although results are good for indicated and selective preventive interventions, the average effects of universal preventive interventions on depressive symptoms from pretest to posttest are small (Mychailyszyn, Brodman, Read, & Kendall, 2012; Stice, Shaw, Bohon, Marti, & Rohde, 2009). Interestingly, Stice et al. (2009) found that relatively shorter prevention programs produced significantly larger intervention effects than did longer prevention programs. Therefore, the authors concluded that long programs may not appeal to youth, which causes greater attrition and attenuated intervention effects. Thus, they recommended the use of brief interventions for future studies.

Regarding aggressive behavior several multicomponent interventions with elements directed towards children and adolescents as well as towards their parents and teachers have been developed and have been found to be effective. Some noteworthy examples are the Coping Power (Lochman & Wells, 2002), the Fast Track (Conduct Problems Prevention Research Group, 2002), the Montreal Preventive Treatment Program (Tremblay, Masse, Pagani, & Vitaro, 1996) and the Incredible Years programs (Webster-Stratton, Reid, & Stoolmiller, 2008). Although these programs have demonstrated to be useful, they are expensive in terms of duration and involvement of various actors (parents, schools, students).

Need of universal brief interventions

In recent years numerous short-term psychosocial interventions have been developed in educational settings with striking effects on several outcomes such as student performance, social integration, and psychological wellbeing (see for a revision Yeager & Walton, 2011). Rigorous field experiments have shown that the effects of such interventions persist for months or even years later. For example, Blackwell, Trzesniewski, and Dweek (2007) got to substantially improve school skills through an intervention based on implicit theories of intelligence, which consisted of showing that intelligence is modifiable and grows when the individual works with effort in challenging tasks. In another intervention, Walton and Cohen (2007, 2011) found that leading students to attribute worries about social integration to the difficulty of the transition to college rather than to students' personal or racial identity can strengthen ethnic minority students' sense of social belonging in school and increase motivation and performance. Furthermore, students who received the intervention reported being happier and healthier in a 3 years posttreatment follow up.

These psychosocial interventions in school can be brief yet impactful because they rely on a rich tradition of research on persuasion and attitude change to powerfully convey psychological ideas (Yeager & Walton, 2011). The crucial elements that contribute to the success of these interventions are the focus on students' experience in school from the students' perspective and the use of impactful delivery mechanisms (Yeager & Walton, 2011). Some of these mechanisms are the following: a) Active role of students, which facilitates deeper message processing; b) Interventions are stealthy. For example, interventions are not presented to the students with the intent to improve performance or other attributes. Thus, students do not feel they are being manipulated so that resistance to intervention is reduced. This approach contributes also to avoid the stigmatization of students. Moreover, the brevity of the interventions also helps to be stealthy. c) Psychosocial interventions have effects over long periods due to recursive processes affecting effects that accumulate over time. Students usually forget the message and the details of the intervention, but this

recursive nature triggers other social, psychological and cognitive mechanisms over time.

Implicit theory of personality (ITP) interventions for emotional and behavioral problems

Recently, Yeager and colleagues have extended this type of brief interventions to prevent emotional and behavioral problems such as depression and aggressive behavior in adolescents. Their approach is based on implicit theories of personality, which refer to the beliefs that people endorse about the malleability of people's socially-relevant traits. An entity theory of personality involves the belief that personal characteristics are fixed and cannot be changed whereas an incremental theory of personality involves the belief that people can change. Past research has found that when adolescents or adults believe that people's traits are fixed and unchangeable, they are more likely to attribute a negative social event (e.g., peer victimization) to their negative traits. They also will tend to infer that the same negative events and other adversities will repeat in the future. Therefore, an entity theory of personality predicts greater shame and negative emotions in adolescents when they cope with stressors such as peer conflicts (Yeager, Trzesniewski, Tirri, Nokelainen, & Dweck, 2011). By the contrary, if adolescents believe that traits can be changed, then their own traits can be improved so that it is unlikely that they become recipients of the same negative events in the future. Furthermore, other people's traits, including those of bullies, can also change. Therefore, the beliefs involved in an incremental theory of personality can be helpful not only for victims but also for perpetrators of bullying. As additional support to this, Rudolph (2010) found that holding an entity theory of peer relationships was associated with a greater tendency to evaluate oneself negatively in the face of peer disapproval and display depressive and aggressive symptoms when victimized.

Yeager and colleagues have developed brief interventions aimed to change entity theories by means of efficient and persuasive intervention tactics that are based on the above mentioned mechanisms. For instance, in one of these interventions, a six-session high school classroom intervention teaching an incremental theory reduced aggressive behavior by 40%, improved depressive symptoms two weeks post-intervention, and increased school attendance (Yeager, Trzesniewski, & Dweck, 2013). Later, they tested the effects of a shorter intervention consisting of only one session. This single session touch an incremental theory via computers. In this session 9th grade students read a scientific article about the possibility of personality change, then they read quotes from older students transmitting the same message. Finally, the students wrote a brief essay where they defended the same idea with the aim of transmitting the message to other students in the future. Despite the brevity of this intervention, the results obtained by means of a double-blind randomized experiment showed that

it reduced levels of self-reported clinically relevant depression (Miu & Yeager, 2014) and stress levels (Yeager et al., 2014).

II. AIMS AND HYPOTHESES

Aim 1: To replicate the effect of an intervention based on Implicit Theories of Personality (ITP) on depressive symptoms and aggressive behavior in a large sample of Spanish adolescents. Grounded on the previous findings obtained in US samples, we will test the efficacy of the ITP intervention by comparing changes in depressive symptoms and aggressive behavior from pretreatment to posttreatment and at a six-month and one-year follow up between the group receiving the ITP intervention and a control group that will receive a control educational condition.

Hypothesis: Those adolescents receiving the ITP intervention will show fewer symptoms of depression and lower frequency of aggressive behavior than the control group after the intervention and at six-month and one-year follow-up.

Aim 2: To identify the biological and cognitive changes that mediate the impact of the ITP intervention in psychological problems. From a biopsychosocial perspective, several mechanisms can explain the effect of the ITP intervention on psychological problems (depression and aggressive behavior). These mechanisms include changes in cognitive vulnerabilities and changes in the biological responses to the environmental stressors. If participants develop beliefs that personality traits are malleable, this should influence many maladaptive cognitive schemas. In fact, a feature of most maladaptive cognitive schemas is their absolute and stable nature (e.g., "I am a bad person", "The others will always reject me", "People hurt me on purpose", "I cannot put limits to my conduct") In addition, developing an incremental theory of personality should also modify the inferential styles, both associated with depression as well as with aggressive behavior. For example, an incremental theory would reduce the likelihood of making inferences consisting of stable causes or attributing bad intentions to others. Improving these cognitive styles in turn would help children and adolescents to react in a more adaptive way to the environmental stressors. This change in the stress reaction should also be detected through hormonal indicators. Therefore, in this project we will evaluate whether the ITP intervention affects cognitive vulnerabilities and biological indicators (cortisol, testosterone and DHEA in saliva) so that these cognitive and biological changes mediate the effect of the intervention on psychological problems.

Hypothesis: the association between the intervention and changes in psychological problems will be mediated by these cognitive and hormonal changes. Some studies have explored whether the effects of interventions on depressive symptoms are mediated by changes in cognitive vulnerabilities with mixed results (Mychailyszyn et al., 2012). Thus, this project aims to contribute to clarifying mediational cognitive mechanisms.

Aim 3: To identify some moderators of the effects of the ITP intervention, such as the age and previous risk factors. Regarding the developmental stage at which the preventive intervention is more effective, though studies are inconclusive, in general there is some consensus that cognitive vulnerabilities tend to consolidate in adolescence. Also in the case of depression prevalence rates increase dramatically during adolescence. This supports the tentative hypothesis that the preventive intervention may be more effective if implemented early (i.e., before depression rates increase and cognitive vulnerabilities are consolidated).

Other moderators to examine in this project are previous risk factors. Findings from previous studies have suggested that interventions aimed at children at risk were more effective in the case of depression (Stice et al., 2007). We will test the hypothesis that environmental risks, such as exposure to violence and poor parenting, temperament traits, such as negative affectivity and Effortful Control, and sex (i.e., girls display higher rates of depression and boys higher rates of some modalities of aggressive behavior), moderate the effects of the ITP intervention on psychological problems, being higher the effects in high risk youths. For instance, we hypothesize that the ITP intervention will lead to a higher reduction of depressive symptoms in girls.

Aim 4: To examine whether the ITP intervention moderates the cross-lagged reciprocal associations between stressors, cognitive vulnerabilities (i.e., cognitive schemas and negative inferences), and psychological problems (depressive symptoms and aggressive behavior).

We expect that the intervention will cut off a downward spiral in which cognitive vulnerabilities, stressors and emotional and behavioral problems influence each other. For instance, youth receiving the intervention could generate fewer stressors. As mentioned above, this objective is innovative as no previous studies have examined the effects of preventive interventions from a transactional perspective. This aim will contribute to identify the recursive processes affecting effects that accumulate over time.

III. METHODS

This study will use a randomized controlled trial study design with pretest, posttest, six-month follow-up, and one-year follow-up. Group 1 (experimental group) will receive the ITP intervention and Group 2 (control group) will receive an educational intervention.

Study design and participants

We will conduct a double-blind randomized controlled trial (RCT) with two parallel groups in a large sample of volunteer adolescents (approximately n=1000), and their parents, from several high school centers (ages from 12 to 18 years). The schools

will be randomly selected from the Basque Country. Participants will be randomly assigned to the experimental vs control groups. Group assignment will be done at the individual level within each classroom. Participants were randomized in a 1:1 ratio blocked by gender to one of two groups (experimental versus control condition). They were assigned to their allocated group in class by the researchers.

Measures

Depressive symptoms and aggressive behavior will be assessed by means of self-reports through the Center for Epidemiologic Studies Depression scale (CES-D; Radloff, 1977), the revised version of the Peer Experiences Questionnaire (RPEQ; Prinstein, Boergers, & Vernberg, 2001), the Cyber Bullying Questionnaire (CBQ; Calvete, Orue, Estévez, Villardón, & Padilla, 2010; Gámez-Guadix, Villa-George, & Calvete, 2014); as well as parents' reports through the CBCL 6/18 (Achenbach, 1991; Achenbach & Edelbrock, 1983).

Measures of cortisol, DHEA and testosterone in saliva: A random subset of the participants (around 60%) will provide saliva samples to be assayed for neuroendocrine levels to measure cortisol, DHEA and testosterone. We will use the two-method of planned missing design (Rhemtulla Jia, Wu, & Little, 2014) to determine the subsample size. Saliva samples will be collected at baseline (one week before the intervention), post-intervention (one week after the intervention) and at the two follow-ups (six-months and one-year follow-up). Data collection will occur in school and the time of assessments will remain the same for each individual to minimize the effects of diurnal rhythms and reduce error variance. The adolescents will complete an intake survey (e.g., eating, drinking, exercise, and medication) that can potentially affect hormonal reactivity. The adolescents will then be directed to transfer saliva from their mouths to a tube. The sample tubes will be carefully labelled. As soon as the session ends, saliva samples will be sent to the assay laboratory.

Cognitive vulnerabilities: Two important cognitive vulnerabilities will be assessed: dysfunctional cognitive schemas and inferential styles. We will measure cognitive schemas that are relevant for depression (i.e., defectiveness, emotional isolation) and for aggressive behavior (i.e., justification of violence, mistrust, grandiosity). We will use the Spanish version of the Young Schema Questionnaire (YSQ; Young, 2006). To assess negative inferential styles in adolescents, we will use the Spanish version of the Adolescent Cognitive Style Questionnaire (ACSQ, Abramson et al., 1989). The ACSQ assesses negative inferences about causes, consequences, and the self, which are characteristics of hopelessness depression. In addition, we will measure implicit theories of personality through the Implicit Theories of Personality questionnaire (Yeager et al., 2014), and rumination through the subscale of brooding rumination of the Children's Response Styles Scale (CRSS; Ziegert & Kistner, 2002).

Environmental stressors: The presence of stressful life events will be assessed by means of a short version of the Adolescent Life Events Questionnaire (ALEQ; Hankin & Abramson, 2002) for adolescents; and the Short version of the Adolescent Life Events Questionnaire (ALEQ; Hankin & Abramson, 2002) for parents. We have used several short versions in previous studies with excellent psychometric properties.

Other risk factors: Measures of temperament and environmental risk will be obtained from adolescents and parents. Temperament will be assessed by the revised version of the Early Adolescent Temperament Questionnaire (EATQ-R; Ellis & Rothbart, 2001) and the Big Five Questionnaire for children (BFQ-C; Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003) for adolescents; and the revised version of the Early Adolescent Temperament Questionnaire (EATQ-R; Ellis & Rothbart, 2001) and the Big Five Questionnaire for children (BFQ-C; Barbaranelli et al., 2003) for parents. Parenting styles will be assessed using the Affection and Communication subscale of the Parenting Style Scale (Oliva, Parra, Sanchez-Queija, & López, 2007) for adolescents; and the Affection and Communication subscale of the Parenting Style Scale (Oliva et al., 2007) for parents.

Preventive Intervention

The **ITP intervention** lasts one session (of approximately one hour) and has three main parts: (1) scientific information; (2) normative stories from upperclassmen; and (3) self-persuasive writing exercise. In the first part, students read a scientific article that provides evidence that individuals have the potential to change. Participants read about actual neurological and behavioral studies showing that behaviors are controlled by “thoughts and feelings in brains,” and that pathways in the brain have the potential to be changed under the right circumstances. In the second part, participants read several normative quotes purportedly written by upperclassmen that previously read the same article and endorsed its conclusions. These quotes are obtained from previous interventions and edited by the team. These testimonials are provided to bring credibility to the incremental theory. Finally, in the last part, participants will be asked to write their own version of such a narrative to share with future students, This activity has been shown to facilitate the internalization of the intervention message, building on a long line of research on cognitive dissonance (Walton & Cohen, 2011). For a more complete description of the ITP intervention see Yeager et al. (2013). The intervention will be adapted to the developmental characteristics of the participants.

The **educational intervention** involves scientific information about the human brain. It was designed to be parallel to the experimental intervention and, hence, it has also three main parts. First, participants are asked to read scientific information about the different areas of the brain and their specialties. Second, participants read several testimonials written by upperclassmen about their transition to high school and how their brains help them to adapt to the new space and all the physical differences of the

building and the classes. Finally, participants are asked to write a letter to another student explaining the main things he or she has learned about the brain and thinks are important for adapting to the new physical environment in high school. Hence it will control for the possibility that simple optimism about the potential for growth might account for our results. This is a conservative control group. An entity theory control group would be unethical in a longitudinal field experiment because it could teach the belief that personality cannot be changed, which has been associated to negative consequences.

Procedure

Parental informed consent forms will be sent to parents and adolescents. Those who accept to participate in the study will complete report measures at four waves: (1) one-week before intervention; (2) one-week after intervention; (3) six-months follow-up; and (3) one-year follow-up. Saliva samples will be collected at the same time points. Parents' participants will complete report measures at three waves: (1) one-week before intervention; (2) six-months follow-up; and (3) one-year follow-up. Intervention will be applied one week after the first survey. All the measures will be anonymous and participants will be asked to provide certain data (her/his birth date, first initial of mother's name, and first initial of father's name) to match their questionnaires, saliva samples and intervention tasks over time. Both interventions and assessment measures will be administered by research assistants during normal class time and last around 50 minutes.

Ethical considerations

This study aims to develop and implement interventions that will be beneficial for the participating adolescents and other people in the future, by helping to increase their psychological wellbeing. Through randomization, the principle of justice will be respected, allowing all participants to have similar opportunities to receive the intervention. Gender will be considered and similar number of male and female participants will be included in the studies.

The risks are minimal and limited to answering psychological tests on stressors, psychological symptoms and cognitive styles. Previous experience with the same questionnaires indicates that the risk is minimal. Adolescents can also decide to end their participation at any moment. Researchers collecting data will be trained to attend to any difficulty that could emerge while participants are responding to questionnaires. The researchers will give an alternative task (e.g., educational readings) to those participants who decide to end their participation.

Informed consent forms will be sent to parents or legal guardians to complete. Adolescents will also receive written information. The active consent of parents or legal guardians and of adolescents will be necessary for participation in the project.

We will incentive adolescents for bringing parent forms, even when decision is negative.

Parents will send their completed questionnaires in a stamped envelope that will be provided without any identifying information. Adolescents will complete the measures in the classroom. Saliva samples and their analysis will be processed according to existing regulations in a professional lab.

After completing measures, adolescents will be provided with information on services for adolescents (e.g., phone number of attention to adolescents). From an ethical perspective, the most important care aspect is the protection of information. We will follow the Directive 95/46/EC of the European Parliament, *Ley Orgánica 15/99 de 13 de diciembre de Protección de datos de Carácter Personal*, and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and the free movement of such data. No identification data, such as names or surnames, will be used; instead, we will use a numeric code to match measures across times and sources (parents, and adolescents). Thus, each adolescent, and only he/she, will know his/her code. We will also follow the procedure for data protection that the University of Deusto has registered in the National Data Protection Agency. The project has been approved by the Ethics in Research committee of University of Deusto.

IV. STATISTICAL ANALYSES PLAN

Descriptive statistics of sociodemographic and study variables will be provided and several statistical strategies will be used to test the hypotheses. These will include mixed analyses of variance (ANOVA), regression analyses, and structural equation modeling. We will employ moderation analyses to test whether age, scholar year, environmental risks, temperament, and sex moderate the effects of the ITV intervention. Cross-lagged analyses including reciprocal associations among stressors, cognitive vulnerabilities, and psychological problems will be modeled to examine whether the ITP intervention moderated these reciprocal associations as proposed in the aims. We will use IBM SPSS, MPLUS, LISREL, and HLM software for analyses.

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