Deleterious effects of unchosen solitude on adolescents' mental and social health: The moderating role of self-esteem

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Scandinavian Journal of Psychology, 2023, 64, 710–718 DOI: 10.1111/sjop.12930

Empirical Article

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Delelis, G. (2023). Deleterious effects of unchosen solitude on adolescents' mental and social health: The moderating role of self-esteem. *Scandinavian Journal of Psychology*, *64*, 710–718.

Can self-esteem reduce the deleterious effects of solitude on adolescents' mental and social health? Solitude is twofold because it can be chosen (self-determined) or forced (not self-determined). When it is not a chosen behavior (e.g., social ignorance, exclusion, or fear of others' judgment), individuals experience higher levels of anxiety and depression and feel the deleterious effects of loneliness more. On the other hand, the level of self-esteem relates positively to lower levels of anxiety and depression as well as to good social relationships. We hypothesized that self-esteem moderates the effects of unchosen solitude. Eighty high school students participated in this study by filling out a self-report booklet of questionnaires. We first examine the links between unchosen solitude and anxiety, depression, loneliness, hopelessness, and quality of the connection to family and peers; next, we examine the moderating role of self-esteem in these links. Regression analyses confirm the classic negative effect of not-self-determined solitude on the health outcomes considered, and moderation analyses show that a good level of self-esteem decreases this effect, at least on depression, hopelessness, and connection to peers. We suggest further studies to complete and refine these results and propose to assess more systematically the adolescents' self-esteem and to reinforce it to prevent negative mental and social health outcomes.

Key words: Unchosen solitude, self-esteem, adolescents, health.

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INTRODUCTION

Numerous authors point out that social isolation and solitude strongly impact the health of people and, in particular, the health of adolescents (e.g., Hall-Lande, Eisenberg, Christenson & Neumark-Sztainer, 2007). The isolation and lockdowns due to the recent COVID-19 pandemic have also led to the observation of increased levels of anxiety and depression as well as a loss of sense of community (for reviews, see Cooper *et al*., 2021; Jetten, Reicher, Haslam & Cruwys, 2020; Loades *et al*., 2020; Oliveira *et al*., 2020). Furthermore, Twenge *et al*. (2021) document that many authors have observed a general increase in adolescent depression and loneliness across the world during the last decade (see also Office of the Surgeon General, 2021). Thus, identifying the health outcomes influenced by loneliness and especially the factors likely to limit this influence is a public health priority.

Solitude and health

Solitude is a complex subjective phenomenon (Coplan & Bowker, 2014; Coplan, Hipson & Bowker, 2021; Long, Seburn, Averill & More, 2003). It is the feeling of being alone, the feeling of being isolated from others. It is an imbalance between a desired social interaction and actual social interactions (Ernst & Cacioppo, 1999; Weiss, 1973), but it can also be a choice made by individuals. While in this second case the effects are positive (e.g., sense of intimacy, personal growth, or appeasement; Andersson, 1998; Galanaki, 2013; Larson & Lee, 1996; Lay, Pauly, Graf, Mahmood & Hoppmann, 2020; Leary, Herbst & McCrary, 2003; Long & Averill, 2003; Long, Seburn, Averill & More, 2003; Nguyen, Ryan & Deci, 2018; Ost Mor, Palgi & Segel-Karpas, 2020), in the first, they are not.

Indeed, when solitude is not a chosen condition, its effects are seen as being highly aversive: general disorders (social, cognitive, or emotional as well as physical; Bossi, Gallucci & Ricciardelli, 2018; Hall-Lande, Eisenberg, Christenson & Neumark-Sztainer, 2007; Loades *et al*., 2020; Menec, Newall, Mackenzie, Shooshtari & Nowicki, 2020), anxiety, stress, and cardiovascular diseases (Hakulinen *et al*., 2018), substance abuse (McKay, Konowalczyk, Andretta & Cole, 2017), depression, and increased risk of death (Holt-Lunstad, Smith, Baker, Harris & Stephenson, 2015; Shankar, Mcmunn, Banks & Steptoe, 2011), for example.

These findings are particularly relevant to adolescents' health and social outcomes. Indeed, others, others' comments, and relations to others are very susceptible to engendering problematic behaviors and degraded well-being (Berndt, 1979; Helfert & Warschburger, 2011). For people in the process of identity and social development, who need thus to be surrounded by peers, perceiving that others evaluate them negatively or thinking that they do could impair motivation, feelings of self-efficacy, and academic and social performance (McFarlane, Bellissimo & Norman, 1995; Samter, 2003; Short, Sandler & Roosa, 1996; Wentzel, 1998) and could increase anxiety, depression, and psychic disorders (Aseltine, Gore & Colten, 1994; Dishion, McCord & Poulin, 1999; Gardner & Steinberg, 2005; La Greca & Moore, 2005; Parker & Asher, 1987; Steinberg & Scott, 2003).

Thus, solitude can be self-determined or not self-determined. Nicol (2006) develops this distinction based on the theory of self-

determination (Deci & Ryan, 1985, 2000), which postulates that human beings are active organisms "naturally" inclined toward the development and mastery of their environment and toward the integration of their personal and social experiences into a coherent self. Thus, they are inclined to prefer (and persist in) activities that they have chosen (called "self-determined") rather than activities that have been imposed on them (called "non-self-determined").

Self-determined motivation for solitude is then an intrinsic motivation associated with individual autonomy (Deci & Ryan, 1985), and, in this case, solitude is a choice or even a general preference; the behavior concerned reflects thus a choice, an interest, and a pleasure. When they decide *themselves* and *for themselves* to isolate socially, individuals can feel pleasure in being alone. The motivation bases here can be the opportunity to resource themselves, to be creative, to experience intimacy, or to find peace (e.g., Galanaki, 2013; Ost Mor, Palgi & Segel-Karpas, 2020).

On the other hand, not-self-determined motivation for solitude is an extrinsic motivation and is at play when an individual believes that her or his social network does not meet his or her interpersonal expectations or may even pose a real (or perceived) threat to her or him (Nicol, 2006). The motivation bases here can be social unease, fear of others' judgment, avoidance of social interactions, or the perception that being with others may conflict with personal goals or self-image.

Then, depending on these intrinsic or extrinsic motivations, the effects of solitude on individuals differ: positive on the one hand (a self-determined behavior – here solitude – being related to individual psychic and psychosocial well-being) and negative on the other hand (a not-self-determined solitude being related to negative effects for the individuals) (Nicol, 2006; Thomas & Azmitia, 2019).

Because not-self-determined solitude relies on a fear of judgment, an anticipation of social rejection, we argue that the way people evaluate themselves (self-esteem) can act as a buffer between them and negative health issues.

Self-esteem and health

Self-esteem refers to the subjective value that individuals attribute to themselves, to the extent to which they like or dislike themselves, value themselves or not, perceive that they are competent or not competent, and are able or not able to meet their needs (Coopersmith, 1967; Pelham & Swann, 1989; Rosenberg, 1979). It is based on the general tendency to perceive oneself as a moral person, worthy of respect and consideration. The self-esteem of individuals determines their actions, feelings of self-acceptance, and self-respect, as well as their relationships in social environments.

To have high self-esteem enables one to know better one' s feelings, to feel fewer negative emotions (Goswick & Jones, 1981; Mund, Finn, Hagemeyer, Zimmermann & Neyer, 2015). Self-esteem has thus a protective effect on health, with high self-esteem associated with better mental and physical health outcomes in adolescence and adulthood, while low self-esteem is considered problematic as it is associated with depression, anxiety, or poor health (Baumeister, Campbell, Krueger & Vohs, 2003; Bolognini & Prêteur, 1998; Chabrol *et al*., 2004; de Moor, Hutteman, Korrelboom & Laceulle, 2019; Dumont & Provost, 1999; Moksnes & Espnes, 2013; Orth, Robins & Widaman, 2012; Trzesniewski *et al*., 2006; Winters, Myers & Proud, 2002; see also Jafflin, Pfeiffer & Bergman, 2019).

To have high self-esteem also enables one to react in a more adapted way in encountered situations. Thus, according to Leary, Tambor, Terdal, and Downs (1995), self-esteem monitors the individuals' reactions and signals the state of their relationships with others (acceptance vs. rejection). It is therefore a subjective marker of the extent to which the individuals feel integrated with others, and it is involved in the maintenance of interpersonal relationships (Orth & Robins, 2014; Sowislo & Orth, 2013).

The behaviors of individuals with lower self-esteem are influenced by their doubts and their focus on protecting themselves from failure and rejection. Their strategy is mainly avoidance – a strategy that also results in lower self-esteem. Individuals with higher self-esteem focus on their strengths and try to maintain them; they would most often seek opportunities for success. This strategy of confrontation helps to further increase their level of self-esteem (Bolognini & Prêteur, 1998). For example, Murray, Holmes, MacDonald, and Ellsworth (1998) and Murray, Holmes, and Griffin (2000) show that a good self-esteem enables individuals to feel more confident regarding the way people will evaluate them, and that this will in turn help them feel good about engaging in social encounters. This is an important fact because in late adolescence, low self-esteem and feelings of loneliness are present in a joint manner (Vanhalst, Luyckx, Scholte, Engels & Goossens, 2013; see also Moeller & Seehuus, 2019), and low self-esteem is also related to negative health outcomes such as depression (Mirabel-Sarron, Vera & Samuel-Lajeunesse, 2001; Short, Sandler & Roosa, 1996) and low feeling of self-efficacy as well as low effective performances (Jessor, Van Den Bos, Vanderryn, Costa & Turbin, 1995; McFarlane, Bellissimo & Norman, 1995).

The present study

Several studies support the idea that unchosen solitude impairs adults' and adolescents' mental and social health. On the other hand, many studies highlight that high levels of self-esteem relate to good mental health and social functioning. We thus postulate that self-esteem could be a moderator of the effects of not-self-determined motivation for solitude on individual mental and social health issues (cf. Cutrona, 1982; Vanhalst, Luyckx, Scholte, Engels & Goossens, 2013). We explore this in adolescents by considering issues such as anxiety, depression, and hopelessness because most researchers point out that these feelings and states strongly affect the personal and social development of adolescents (e.g., Goossens, 2006; Goswick & Jones, 1981, 1982; Heinrich & Gullone, 2006; Lasgaard, Goossens & Elklit, 2011; McMillan, Gilbody, Beresford & Neilly, 2007), their feelings of solitude, and their family and peer social connections because loneliness is related to the subjective quality of social relationships and perceived social acceptance (Asher & Paquette, 2003) and because self-esteem is likely to impact these issues that are

relevant for the development of both good relationships and a positive identity (Cutrona, 1982; Galanaki, 2013; Gazelle & Druhen, 2009; Goswick & Jones, 1982; La Greca & Moore, 2005; Vanhalst, Luyckx, Scholte, Engels & Goossens, 2013).

We therefore hypothesize that (1) not-self-determined solitude increases levels of anxiety, depression, loneliness, and hopelessness and decreases connections to family and peers, (2) self-esteem decreases levels of anxiety, depression, loneliness, and hopelessness and increases connections to family and peers, and (3) the level of self-esteem reduces the deleterious effects hypothesized for not-self-determined solitude.

METHOD

Participants

We recruited the participants in collaboration with student investigators who approached them first. We thus invited high school students in Grades 10 and 11 to participate in the study. After distribution of consent forms and agreement of the participants and their parents, we first gave them oral information about the study and then asked them to complete the consent form before receiving, a few days later, a booklet of questionnaires. They were not paid or compensated for their participation. The high school students answered the questionnaires in their classrooms in the (distant) presence of the person in charge of administering it. Once the questionnaires were completed, we asked the students to express their feelings or ask any questions about the study. Finally, we asked them not to hesitate to contact us if they wished to discuss something in private. Eighty participants agreed to take part in the study and submitted fully usable questionnaires. Among the participants, girls ranged in age from 15 to 17 years (N = 47, M = 15.6, SD = 0.71) and boys from 15 to 18 years (N = 33, M = 15.8, SD = 0.75).

Materials

Self-esteem. We assessed the participants' global self-esteem using the Rosenberg Self-Esteem scale (RSE; Rosenberg, 1965, French version: Vallières & Vallerand, 1990), a 10-item measure to be completed by indicating one's degree of agreement using a four-point Likert scale ranging from 1 = *Strongly disagree* to 4 = *Strongly agree*. The higher the score, the better the self-esteem, and a score below 30 corresponds to low self-esteem (cf. Chabrol *et al*., 2004; Winters, Myers & Proud, 2002). The RSE is the most often used measure in studies of self-esteem and in studies of mental and physical health in adolescents (Winters, Myers & Proud, 2002). Its reliability and validity in adolescents are satisfactory (cf. Chabrol *et al*., 2004).

Motivation for solitude. We assessed the participants' motivation for solitude using the Motivation for Solitude Scale–Short Form (MSS-SF; Thomas & Azmitia, 2019, French version: authors, in revision), a 14-item self-assessment scale based on a four-point Likert scale ranging from 1 = *Not at all important* to 4 = *Very important*. The MSS-SF assesses an individual's self-determined solitude (SDS, associated with self-selected behaviors and individual autonomy) and not-self-determined solitude (NSDS, associated with suffered isolation). The higher the score on a dimension, the greater this dimension is at stake.

Anxiety and depression. We assessed the participants' symptoms of anxiety and depressive disorders using the Hospital Anxiety and Depression scale (HAD; Zigmond & Snaith, 1983; see also Bjelland, Dahl, Haug & Neckelmann, 2002), a scale that consists of 14 items scored from 0 = *never/not at all* to 3 = *yes/very often*, some of which are reverse scored. Seven items score for the anxiety dimension and seven for the depression dimension. The score is the sum of the responses for each of the two dimensions. The higher the score on the anxiety and/or depression items, the greater the level of anxiety and/or depression. For each dimension, a score of 11 or more represents a clinical score. A score between 8 and 10 is a borderline score.

Hopelessness. We assessed the participants' feelings of hopelessness using the Beck Hopelessness scale (Beck, Weissman, Lester & Trexler, 1974; French version: Bouvard, Charles, Guérin, Aimard & Cottraux, 1992), a scale that includes 20 items scored from 0 (not pessimistic answers) to 1 (pessimistic answers) and that measures attitudes and perceptions about the future, particularly negative feelings about the future, loss of motivation, and pessimistic expectations. The score is the sum of the answers, and the higher the score, the more the participants are experiencing hopelessness. The psychometric qualities of this scale are satisfactory: Cronbach's alpha is 0.88 for non-psychiatric patients (Steed, 2001). The clinical cutoff is set at 9 out of 20 and is correlated with suicidal risk and suicide attempts (Beck, Steer, Kovacs & Garrison, 1985; McMillan, Gilbody, Beresford & Neilly, 2007).

Feeling of loneliness. We used two additional items to explore the frequency with which the participants experience feelings of loneliness ("In the past week, have you felt lonely?" and "Do you often feel lonely?"). The choices of answers to these two items ranged from 0 = *Never* to 3 = *Very often*. The score is the sum of the answers; the higher the score, the more the participants are reporting loneliness.

Social connection. We assessed the participants' level of social connection through two dimensions – Family (e.g., "in my family. . .," "the climate in my family is relaxed" or "I like to talk with my father or mother") and Peers (e.g., "with young people my age. . .," "I often feel rejected" or "I can give my opinion, like the others") – of the *Echelle d'Affiliation Contextuelle pour Adolescents* (EACA; Contextual Connection Scale for Adolescents, Cartierre, Demerval & Coulon, 2009). These dimensions each consist of six items associated with four-point scales ranging from 0 = *no* to 3 = *yes*. The score per dimension is the sum of the responses to the corresponding items. The higher the score, the better the quality of transactions with the target context.

Analyses

Statistical analyses were conducted using Jamovi 2.2.5. The criterion for statistical significance was set at $p \leq 0.05$. After reviewing the data, we followed a specific data analysis plan including, first, a descriptive analysis of the variables (M and SD) and an analysis of the correlations (Pearson's r) between the observed scores; second, a series of simple linear regressions to examine the separate effects of NSDS and self-esteem on the health outcomes considered (i.e., anxiety, depression, hopelessness, loneliness, and connection to family and peers); and third, a moderation analysis to test the hypothesized moderating effect of self-esteem on the links between NSDS and the outcomes.

RESULTS

Descriptive statistics and correlation analysis

The observed scores for the factors considered are 27.5 (SD = 6.4) for self-esteem, a score that is slightly below the average self-esteem score (Chabrol *et al*., 2004; Vallières & Vallerand, 1990), and 11.4 (SD = 4.4) for NSDS.

The scores and means of the health and social outcomes are presented in Table 1, along with the correlations between them. Table 1 shows that the level of the participants' anxiety is a clinical score (Bjelland, Dahl, Haug & Neckelmann, 2002) and that the health outcomes correlate, except for, on the one hand, connection to the family and, on the other hand, anxiety, hopelessness, and connection to peers.

Table 1. *Scores (M, SD) and correlations (Pearson's r and significance) between the adolescents' health and social outcomes*

	M (*SD*)	Correlations (significance)				
		2	3	4	5	6
1. Anxiety	10.9 (4.1)				−0.173 (0.125)	−0.417 (<0.001)
		0.36 (<0.001)	0.355 (<0.001)	0.579 (<0.001)		
2. Depression	5.8 (3.2)				−0.316 (0.004)	−0.403 (<0.001)
			0.533 (<0.001)	0.498 (<0.001)		
3. Hopelessness	5.8 (4.2)				−0.181 (0.108)	−0.367 (<0.001)
				0.516 (<0.001)		
4. Feeling of loneliness	2.2 (1.8)				−0.260 (0.02)	−0.596 (<0.001)
5. Connection to family	13.2 (4.0)					0.132 (0.244)
6. Connection to peers	12.2 (3.7)					

Analyses of the effects of NSDS and self-esteem on the measures

We tested the effects of NSDS and self-esteem on health and social issues (Table 2). All effects of NSDS are significant: The higher the scores on NSDS, the higher the scores for anxiety, depression, hopelessness, and feelings of solitude, and the lower the scores for social connection (both to the family and to peers). All effects of self-esteem on health and social issues reach significance too but, as expected, in the opposite direction to the effects of NSDS.

Analysis of the moderating role of self-esteem

We tested the moderating influence of self-esteem on the effects of NSDS on the health outcomes considered. Even though the level of self-esteem positively influences the level of anxiety, it does not moderate the relation between NSDS and that anxiety; the interaction does not reach significance, $z = 0.683$, $p = 0.494$. The same result is true for the score for feelings of solitude ($z = -0.239$, $p = 0.811$) and the score for connection to the family ($z = -1.231$, $p = 0.218$).

On the other hand, self-esteem moderates the relation between NSDS and depression, $z = -1.984$, $p = 0.047$. More precisely, when one considers the level of self-esteem, NSDS still only increases the level of depression of the participants with low self-esteem (i.e., scores below the mean score minus one standard deviation); when self-esteem is average or high (i.e., scores below the mean score plus one standard deviation), this effect is no longer significant (Table 3).

Self-esteem has the same moderating effect on the relationship between NSDS and hopelessness, $z = -2.691$, $p = 0.007$. Again, except when low, the level of self-esteem moderates this relationship whether it is average or high (Table 4). Finally, self-esteem tends to moderate the relation between NSDS and connection to peers, $z = 192$, $p = 0.055$ (Table 5).

Table 2. *Effects of not-self-determined solitude and self-esteem on adolescents' anxiety, depression, hopelessness, loneliness, and connection to family and to peers*

	Not-self-determined solitude			Self-esteem		
	R^2	*t*	*p*	R^2	*t*	*p*
Anxiety	0.135	3.49	<0.001	0.266	−5.32	<0.001
Depression	0.201	4.43	<0.001	0.400	−7.22	<0.001
Hopelessness	0.231	4.59	<0.001	0.452	−8.02	<0.001
Feeling of loneliness	0.395	7.13	<0.001	0.444	−7.89	<0.001
Connection to the family	0.049	−2.02	0.047	0.157	3.81	<0.001
Connection to peers	0.526	−9.3	<0.001	0.213	4.6	<0.001

DISCUSSION

We postulated that the level of self-esteem would moderate the effect of not-self-determined solitude on mental and social health issues. This hypothesis is partially confirmed. It is the case for depression and hopelessness and it tends also to be true for connection to peers. Our results thus suggest that for an adolescent with average or high self-esteem, the loneliness generated by the perceived regard of others or the fear of others (i.e., not-self-determined solitude) no longer has as much of an effect on her or his experience of depressive symptoms and the quality of her or his transactions with the context of peers (tendency). These findings emphasize the importance of testing the adolescents' level of self-esteem and helping them to develop good self-esteem.

At this point, a more precise extension of the present work should be envisaged. Indeed, a potential limitation of the present study is that we have considered global self-esteem as measured by Rosenberg (1979), yet self-esteem can develop differently depending on the domain: school, sports, etc. (e.g., Harter, 2006; Harter & Monsour, 1992). Even though, according to Orth and Robins (2014), the vulnerability effect of low self-esteem is

Table 3. *Effect of not-self-determined solitude on adolescents' depression at low, average, and high levels of self-esteem*

	Estimate	*SE*	*z*	*p*
Low self-esteem (−1 SD)	0.1743	0.0695	2.507	0.012
Average self-esteem	0.0640	0.0674	0.950	0.342
High self-esteem (+1 SD)	−0.0463	0.1029	−0.450	0.653

Table 4. *Effect of not-self-determined solitude on adolescents' hopelessness at low, average, and high levels of self-esteem*

	Estimate	*SE*	*z*	*p*
Low self-esteem (−1 SD)	0.2390	0.0869	2.751	0.006
Average self-esteem	0.0556	0.0838	0.664	0.507
High self-esteem (+1 SD)	−0.1278	0.1272	−1.004	0.315

Table 5. *Effect of not-self-determined solitude on adolescents' connection to their peers at low, average, and high levels of self-esteem*

	Estimate	*SE*	*z*	*p*
Low self-esteem (−1 SD)	−0.623	0.0716	−8.70	<0.001
Average self-esteem	−0.513	0.0699	−7.33	<0.001
High self-esteem (+1 SD)	−0.402	0.1069	−3.76	<0.001

driven, for the most part, by general evaluations of worth (that is, global self-esteem) rather than by domain-specific self-esteem, we suggest, for an adolescent population, examining the effect of school-based self-esteem versus out-of-school activity-based self-esteem on the impact of NSDS on health measures as well as social and academic performance. This could perhaps make it possible to get closer to the adolescents' experiences, feelings, and behaviors.

Another line of inquiry could be to test jointly self-esteem and self-control, the feeling of being in control in situations we face. The present study did not consider this self-control and, indeed, self-control may matter. People with high self-esteem would have higher aspirations (Baumgardner, 1990; Campbell, 1990) and would persist more in dealing with failure (Shrauger & Sorman, 1977), and they might experience more clarity, self-connection, and self-efficacy (Klussman, Curtin, Langer & Nichols, 2022; Schlegel & Hicks, 2011; Sheldon, 2014). Because self-control increases with a favorable self-view, it may be that what is at stake in our results is specifically due to this self-control: Self-control may lessen the risk of being engaged in problematic social interactions through increased awareness of how to act, what to say, etc., and could help one not to feel negatively judged by others (e.g., Stavrova, Ren & Pronk, 2022). We thus suggest exploring the links between, on the one hand, adolescents' self-esteem, self-control, self-efficacy, and self-connection and, on the other hand, health and social outcomes to complete the portrait that we initiate here.

Another issue that emerges is the lack of a moderating effect of self-esteem in the relationship between NSDS and anxiety level. This hypothesis is indeed not validated. An explanation may be that the measure of anxiety used here is general, and the mean score is surprisingly high. Disentangling general anxiety and social anxiety (and anxiety related to a performance versus to social interactions) might be of interest, for example by using the Liebowitz Social Anxiety Scale (Liebowitz, 1987) or a version adapted to adolescents (La Greca, 1999) in a future study.

Furthermore, different mediating mechanisms could be involved for anxiety and depression (e.g., Wenze, Gunthert & German, 2012). Depression is more related to intrapersonal aspects of the self, whereas anxiety may be more closely related to interpersonal aspects of the self, even if one considers general anxiety (Mor & Winquist, 2002; Sowislo & Orth, 2013). Indeed, Mlawer, Hubbard, Bookhout, and Moore (2021) observe the same results as ours and discuss them in terms of different focuses for anxiety and depression: anxiety resulting from prospective rumination of future events and depression resulting from retrospective rumination of past experiences. These different mechanisms involved in the relationship between self-esteem and anxiety versus depression could thus be a potential avenue for future research too, perhaps in addition to a measure of rumination tendency and forms and an assessment of the type of emotion regulation.

In any case, self-view is a particularly salient factor in models of cognitive vulnerability (e.g., van Tuijl, de Jong, Sportel, de Hullu & Nauta, 2014), and its contribution in the relationship between NSDS and, at least, depression in adolescents appears to be a very relevant element to identify. Indeed, researchers often show a negative relationship between the level of self-esteem and the level of depression or stress (Andrews, Lewinsohn, Hops & Roberts, 1993; Brage, Campbell-Grossman & Dunkel, 1995; Chabrol *et al.*, 2004; Dervishi, Peposhi & Ibrahimi, 2020; Mlawer, Hubbard, Bookhout & Moore, 2021; Winters, Myers & Proud, 2002), and the level of self-esteem may have an even more important role in minimizing the deleterious effects of risk factors on health.

Depending on their level of self-esteem, adolescents seem to differently value others' judgments. Those with high self-esteem appear thus to place less importance on the judgment of others – and in this case, negative judgments and rejection – as well as they seem to be more comfortable projecting themselves into the future and sharing good quality interactions with their peers. Self-esteem could therefore help reduce some of the judgment and evaluation biases (e.g., Swann, Chang-Schneider & Larsen McClarty, 2007; Van Duüren & Di Giacomo, 1997; vanDellen, Campbell, Hoyle & Bradfield, 2010).

Indeed, in the motivation for solitude scale, the items assessing NSDS refer, in particular, to individuals' feelings of being rejected by others or their uneasiness related to interacting with others. This alienation corresponds to the subjective point of view of the adolescent and thus refers to her or his interpretation of the behaviors of others toward her or him. One can imagine that self-esteem of good quality reduces a cognitive bias of negativity that would lead to attributing significant weight to the negative aspects perceived in the environment and to the evaluation of others' points of view as being necessarily negative, which would have as a consequence for the individual concerned the generation of ruminations and health disorders, including depressive symptoms (Baumeister, Bratslavsky, Finkenauer & Vohs, 2001; Laval, Dardier, Laval & Laura, 2016). Based on these data, it would be interesting to conduct future studies to clarify the role of self-esteem in the relationship between negativity bias, intention inferences to others, perspective taking, social modeling, experience of loneliness, ostracism, communication skills, and their effects on psychological well-being.

To go beyond the limitations of this study, we propose a larger research design that would consider several points. The small

number of participants is the first limitation, and it would be appropriate to replicate such a study by increasing the number of (male and female) adolescents. In particular, this would make it possible to test for gender differences in these effects of self-esteem on health and social outcomes (e.g., Kling, Hyde, Showers & Buswell, 1999; Reid, 2004). We also mentioned the potential interest in examining the effects of domain-specific self-esteem instead of general self-esteem to capture at best what is at stake in the adolescents' health outcomes relative to a specific context of life. Furthermore, an additional limitation has been the use of a two-item measure of loneliness. A future study could include a measure such as the Social and Emotional Loneliness Scale for Adults (SELSA; DiTommaso, Brannen & Best, 2004; DiTommaso & Spinner, 1993) to highlight the solitude better and to disentangle emotional and social solitude. Finally, we think that identifying the role of adolescents' emotional competences or difficulties in emotion regulation could be of interest.

From an applied point of view, we also encourage promoting measures of self-esteem in adolescents as well as, because self-esteem is variable in nature (Youngs, Rathge, Mullis & Mullis, 1990), workshops, games, role playing or positive stimulation and feedbacks, or other activities to develop and strengthen it. As such, self-esteem has a positive effect on psychological and social health outcomes; it also has, as our results show, this positive effect even when other factors such as unchosen solitude are not favorable to adolescents. Strengthening self-esteem might therefore be particularly helpful in avoiding the development of depressive symptoms (Dervishi, Peposhi & Ibrahimi, 2020), possibly because perceiving oneself positively might reduce the propensity to ruminate on past experiences (Mlawer, Hubbard, Bookhout & Moore, 2021) through a sense of being a "capable self" and having the strength and abilities to handle current potentially harmful episodes (Heimpel, Elliot & Wood, 2006; Jessor, Van Den Bos, Vanderryn Costa & Turbin, 1995). In the same way, developing adolescents' self-esteem could help them pay less attention to others' judgments (mainly peers' judgments) and subjective norms (e.g., Sanderson, Darley & Messinger, 2002) and better regulate their emotions (Fernandes, Newton & Essau, 2022; Gomez, Quiñones-Camacho & Davis, 2018) as well as increase their social, physical, and academic performance (e.g., Chen, Sun & Wang, 2018; Coudevylle, Ginis & Famose, 2008).

CONFLICT OF INTEREST

The author declares no conflict of interest.

ETHICAL APPROVAL

The procedure used in this study complies with the research ethics standards. Information letters and consent forms were collected.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Received 7 January 2023, Revised 6 April 2023, accepted 2 May 2023