

From social anxiety to identity formation: The bridging roles of self-esteem and speech avoidance

Omer Levy Kardash ^{*}, Adi Arden, Hanit Ohana, Maya Benish-Weisman

Paul Baerwald School of Social Work and Social Welfare, The Hebrew University of Jerusalem, Jerusalem, Israel.

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ABSTRACT

Adolescence is a critical developmental period during which individuals form a coherent sense of identity -a process that can be disrupted by emotional difficulties. While general anxiety symptoms have been extensively studied in relation to identity formation, the specific contribution of social anxiety remains underexplored. This sixmonth longitudinal study examined how adolescents' social anxiety relates to three dimensions of identity formation: commitment, in-depth exploration, and reconsideration of commitment. The study also investigated the mediating roles of self-esteem and avoidance of speech situations. A multi-informant design was employed, drawing on self-reports from 186 adolescents aged 12-18 and their parents. Mediation analyses revealed that higher levels of social anxiety were indirectly associated with lower identity commitment and greater reconsideration of commitment, primarily through reduced self-esteem and increased avoidance of speech situations. For in-depth exploration, avoidance of speech situations emerged as the sole significant mediator. These findings were consistent across both adolescent- and parent-reported models. By identifying self-esteem and speech avoidance as key mediators, the study offers both theoretical insights and clinically relevant guidance for early identification and intervention strategies aimed at supporting identity development in socially anxious adolescents.

1. Introduction

Adolescence is a formative stage when individuals grapple with questions of identity, self-worth, and belonging. Although the link between anxiety and identity development has been acknowledged, the specific mechanisms through which anxiety, particularly social anxiety, shapes identity formation remain insufficiently understood [1,2,3,4]. We examined how social anxiety relates to adolescents' future identity, using a longitudinal design spanning six months and drawing on both adolescent self-reports and parental assessments to enable a comprehensive understanding of adolescents' internal experiences and observable behaviors. By identifying the mediating roles of self-esteem and avoidance of speech situations, our study deepens theoretical insight and has practical implications for interventions aimed at supporting adolescents during identity formation.

2. Theoretical background and hypotheses

2.1. Identity formation in adolescents

Adolescence is a critical period characterized by significant physical, cognitive, social, and emotional changes. Adolescents undergo profound self-exploration and development [5], struggling with fundamental existential questions such as "Who am I?" and "What defines me?" A well-established identity provides the framework for answering these questions. Identity is an internalized sense of self, encompassing one's understanding of personal direction, values, and aspirations. It fosters independence and autonomy [6] and serves as a foundation for future well-being, meaningful relationships, and a sense of purpose)[7,8,9]).

During identity formation, adolescents first go through a period of identity exploration and then commit to a chosen identity [10,11]. The Three-Factor Model [1] divides it into three processes: commitment, in-depth exploration, and reconsideration of commitment. *Commitment* refers to decisions individuals make in various life domains and the confidence they derive from them. Strong commitment contributes to

* Corresponding author at: Mount Scopus Campus, Jerusalem 9190501, Israel.

E-mail address: omer.levy.h@gmail.com (O. Levy Kardash).

multiple aspects of well-being, including psychological health, life satisfaction, and overall functioning [12,13]. Recent longitudinal research among Italian mid-adolescents found adolescents' ability to commit to an identity was related to future psychological, physical, and social well-being, and their well-being supported the consolidation of identity [13].

In-depth exploration involves critically evaluating current commitments by seeking additional information, reflecting on personal choices, and discussing them with others. It is associated with traits such as conscientiousness and openness to experience, suggesting a thoughtful and responsible approach to identity development [1,14]. However, excessive exploration may lead to uncertainty, lower self-concept clarity, and vulnerability to anxiety, depressive symptoms, and distress [1,15]. Accordingly, relations between in-depth exploration and well-being are complex and vary across dimensions of well-being [13].

Reconsideration of commitment entails comparing current commitments with options, particularly when existing commitments no longer feel satisfactory. This process is often marked by uncertainty [1] and has been linked to maladaptive developmental outcomes, emotional distress, and strained family relationships [16,17].

Identity formation is a significant developmental task with long-term implications for well-being, academic achievement, and career adjustment [8,18]. The process is inherently complex, as it involves exploring possibilities and committing to specific identity choices. Adolescents are required not only to shape a coherent sense of self but also to relinquish appealing alternatives [19], a task that can generate uncertainty and self-doubt. We argue these challenges may be particularly pronounced among adolescents experiencing internalizing difficulties, such as anxiety symptoms [20].

2.2. Anxiety and identity formation

Anxiety is characterized by excessive worry, fear, and physiological symptoms, often in response to perceived threats [21], with an impact on functioning and quality of life. It can hinder the process of identity formation by amplifying uncertainty and hindering commitment, leaving adolescents stuck in identity confusion instead of achieving a coherent sense of self [20,22]. Non-clinical levels of anxiety vary depending on individual experiences and situational stressors; while some adolescents exhibit minimal or no anxiety, others experience mild to moderate levels [23,24,25]. Numerous studies on non-clinical populations have identified a connection between anxiety and identity formation [1,2,3,4].

A meta-analysis examining relations between identity status and anxiety reviewed 12 studies involving 1124 participants (mostly university students) and found individuals with higher levels of anxiety were more likely to exhibit a foreclosed identity status, characterized by high commitment without prior exploration [26]. Other studies suggest adolescents with high anxiety experience ongoing difficulty stabilizing identity commitments. A longitudinal study found adolescents with elevated anxiety faced greater challenges in the identity formation process than low-anxiety peers [20]. Their commitment was less stable over time, and they demonstrated higher levels of reconsideration, reflecting ongoing uncertainty. Taken together, findings suggest that while some anxious adolescents may reach commitments, they often experience ongoing doubts and reconsiderations about these commitments, undermining the stability and coherence of their identity over time.

While general anxiety symptoms have been extensively studied in relation to identity formation, the specific contribution of social anxiety has received less attention. Social anxiety, a subset of broader anxiety symptoms, is characterized by a persistent fear of social or performance situations in which individuals anticipate being scrutinized or negatively evaluated. This leads to avoidance behaviors or distress, interfering with daily functioning, academic performance, social relationships, and overall well-being [21]. Individuals may recognize

their fears as excessive but find it difficult to overcome them. Adolescents can display a range of social anxiety levels, from minimal symptoms to moderate or more forms [27,28,23,24]. Given its continuum nature, it is important to study non-clinical populations, as even subtle symptoms may be meaningful [29].

Adolescence is a period of expanded social interactions beyond the family unit and exposure to new social environments, especially with peers [30]. Peer relationships give adolescents a crucial space for identity exploration, offering opportunities for social comparison, feedback, and validation [31].

Given the importance of social engagement for identity formation [32,33], social anxiety may shape how adolescents commit to, explore, and reconsider identity choices. To clarify these processes, we examined two potential mediators: self-esteem and avoidance of speech situations.

2.3. Mediating role of self-esteem

Like anxiety, self-esteem, an individual's overall evaluation of self-worth, ranging from a positive to a negative self-view [34], is a component of well-being, but self-esteem reflects positive well-being, while anxiety reflects negative well-being. Adolescents with anxiety disorders tend to report lower self-esteem [35,36,37], with social anxiety exerting the strongest negative influence among anxiety disorders [38]. Higher self-esteem is negatively associated with social anxiety levels in adolescents, regardless of gender, age, or family income [39].

In turn, self-esteem plays a key role in identity formation. Higher self-esteem has been associated with identity achievement; lower self-esteem has been linked with less certainty and commitment [40,41,42]. Although self-esteem is recognized as a significant factor in identity formation, its precise role is poorly understood. A meta-analysis of 18 studies yielded mixed findings, with some finding associations between high self-esteem and identity characterized by strong commitments, such as achievement and foreclosure [41]. It remains unclear whether self-esteem is specifically related to identity achievement, which involves both exploration and commitment, or is primarily linked to the level of commitment, regardless of prior exploration.

2.4. Mediating role of avoidance of speech situations

Social anxiety during adolescence can lead to the avoidance of speech. Adolescents with social anxiety frequently exhibit intense fear of negative judgment, resulting in avoidance behaviors, particularly in situations involving public speaking, formal conversations, social interactions, or simply observation by others [43,44,45]. Avoidance extends beyond specific social situations and is associated with broader difficulties. Adolescents who avoid speaking situations struggle to cope with school demands, have fewer friendships, and report reduced intimacy with their parents [43,46]. Avoidance of speech situations, therefore, may play a mediating role between social anxiety and difficulties in identity formation.

Speech and communication are fundamental to identity formation [47,48]. Personal identity emerges through communicative interactions, especially dialogues with close others. These interactions create pragmatic microstructures- repetitive communication patterns that influence identity development over time, facilitating adolescents' ability to articulate personal experiences, reflect on themselves, and establish identity coherence [47]. Dialogue is not merely a reflection of identity but also a space where identity is formed and negotiated. When adolescents are encouraged to express themselves, and their perspectives are genuinely considered by others, they are more likely to develop a stable, mature sense of identity [49]. Conversely, avoidance of speech situations hinders identity formation. Adolescents who avoid speaking may opt for safe, familiar identities rather than exploring new ones, limiting opportunities to develop a coherent, integrated sense of identity. Marcia [2] argued adolescents who prematurely commit to an identity without exploration may do so to avoid anxiety.

Verbal communication, both within the family and in broader social contexts, is integral to identity formation. Avoidance of speech rooted in social anxiety disrupts these communicative processes and impairs identity development. Self-esteem and avoidance of speech situations may each independently mediate relations between social anxiety and identity formation. They may also have a joint effect. Low self-esteem can predict social avoidance, highlighting its risk for social withdrawal in adolescence [50,51]. Adolescents with low self-esteem may avoid speaking situations, which in turn, may hinder their ability to form a coherent identity. Therefore, we suggest self-esteem and avoidance of speech situations may act as sequential mediators, forming an indirect pathway through which social anxiety affects identity.

2.5. Study objectives

This study examined longitudinal associations between adolescents' social anxiety and identity formation using adolescent and parent reports across two time points. Social anxiety was assessed at Time 1 (T1) and mediators and identity outcomes were measured six months later at Time 2 (T2).

We tested whether self-esteem and avoidance of speech situations independently mediated the associations between social anxiety and identity outcomes. In addition, we examined a sequential mediation pathway, in which social anxiety would predict lower self-esteem, which in turn would predict greater speech avoidance, ultimately shaping identity processes.

Finally, we compared adolescent and parent-reported social anxiety to determine whether the hypothesized pathways differed across informants.

3. Hypotheses

H1: Social anxiety reported by both adolescents and parents (T1) will be significantly associated with the three dimensions of identity: commitment, in-depth exploration, and reconsideration (T2) [1]. Specifically:

H1a: Higher levels of social anxiety will be linked to lower identity commitment.

H1b: As in-depth exploration has both positive and maladaptive effects [17] on identity formation, we examined its associations with social anxiety without assuming a specific directional outcome.

H1c: Social anxiety will be positively associated with reconsideration of commitment.

H2: Self-esteem will mediate relations between social anxiety at T1 and three identity dimensions (commitment, in-depth exploration, reconsideration) at T2.

H3: Avoidance of speech situations will mediate relations between social anxiety at T1 and three identity dimensions (commitment, in-depth exploration, reconsideration) at T2.

H4: Self-esteem and avoidance of speech situations will function as sequential mediators of relations between social anxiety and identity formation.

4. Method

4.1. Sample and sampling

The study included 186 Israeli adolescents (58.6 % male), aged 12 to 18 years ($M = 14.62$, $SD = 1.87$), and their mothers (Mage 46.35, $SD = 4.80$). Parent-report data were collected solely from mothers to maintain consistency across respondents. All participants were Jewish and Hebrew-speaking, representing various levels of religiosity, including secular (67.2 %), religious (26 %), and ultra-Orthodox (6.8 %). Most adolescents (92.47 %) were Israeli-born; a minority (7.53 %) were immigrants. The majority of mothers (83.0 %) had a high level of education, at least a BA. Participants were recruited through online platforms

and a snowball sampling method across different regions of Israel.

To evaluate the adequacy of the sample size for the planned analyses, we conducted a power analysis using G*Power 3.1 [52]. With a sample size of 186, $\alpha = 0.05$, and a medium effect size ($f^2 = 0.10$), the statistical power was 0.96, demonstrating the study was sufficiently powered to detect effects of this magnitude.

4.2. Procedure

Parents of potential participants received an information sheet detailing the study and providing a consent form for both themselves and their child. Adolescents were given study information and asked to sign an informed consent form. Once consent was obtained, a link to the online questionnaires, hosted on the Qualtrics platform, was sent via email or mobile phone to both adolescents and mothers. Six months later, participants were asked to complete the consent forms and questionnaires again, following the same procedure. Participants received a gift card for each assessment phase. At T1, they were given an 18\$ voucher, at T2, a 22\$ voucher. The study received ethical approval from the authors' Institutional Review Board (IRB), approval number 2023HLE031.

4.3. Measures

All surveys were in Hebrew. When a Hebrew version was not available, materials were translated from English using a back-translation method. Participants provided demographic details such as gender, age, and other relevant information. Adolescent social anxiety was assessed at T1, whereas self-esteem, avoidance of speech situations, and identity formation were assessed six months later at T2.

4.3.1. Adolescents' social anxiety (T1)

Social anxiety was assessed by adolescent and parent reports. Adolescents completed an abbreviated, six-item version of the Social Interaction Anxiety Scale (SIAS; [53]), a self-report measure assessing anxiety experienced during social interactions [54]. Respondents rate each item on a five-point Likert scale from 0 (not at all characteristic or true of me) to 4 (extremely characteristic or true of me). For instance: "I feel tense if I am alone with just one person". The questionnaire is applicable to adolescents [55]. Cronbach's alpha = 0.81.

Parents responded to the eight-item Social Anxiety Disorder subscale from Screen for Child Anxiety Related Emotional Disorders (SCARED; [56]). SCARED is designed to evaluate anxiety symptoms and related emotional challenges in children aged eight to 18 years. Mothers selected responses that best captured their child's behavior and feelings over the past three months using a three-point Likert scale: 0 (not true or hardly ever true), 1 (sometimes true), 2 (very often true). For example: "My child feels nervous with people he/she doesn't know well". This instrument is employed in both clinical and research settings, and a Hebrew version is available [57]. Cronbach's alpha = 0.85.

4.3.2. Identity formation (T2)

The Utrecht-Management of Identity Commitments Scale (U-MICS; [1]) is a self-report measure evaluating three dimensions of identity formation: commitment, in-depth exploration, and reconsideration of commitment. This tool can be applied to assess identity processes within a specific domain or to measure global identity by combining one ideological domain (e.g., educational or job identity) with one relational domain (e.g., peer or romantic relationship). We examined global identity by focusing on two domains central in adolescents' lives: educational and interpersonal identity (i.e., friendship). The instrument has 26 items, 13 allocated to each domain: five measure commitment, five assess in-depth exploration, and three evaluate reconsideration of commitment. Each is rated on a five-point Likert scale from 1 (completely untrue) to 5 (completely true). For example: "My education/best friend gives me certainty in life" (commitment, $\alpha = 0.83$); "I

think a lot about my education/best friend" (in-depth exploration; 10 items, $\alpha = 0.76$); "I often think it would be better to try to find a different education/best friend" (reconsideration of commitment; 6 items, $\alpha = 0.75$). A Hebrew version of the questionnaire is available; it has been validated with adolescents [58].

4.3.3. Self-esteem (T2)

The Rosenberg Self-Esteem Scale (RSE; [34]) is a self-report questionnaire measuring general self-esteem. RSE consists of 10 statements measuring self-esteem by evaluating positive and negative feelings towards the self. Participants are asked to rate each statement on a four-point Likert scale, from 1 (strongly disagree) to 4 (strongly agree). For instance, "I feel I do not have much to be proud of". A Hebrew version of the questionnaire is available and is suitable for use with adolescents [59]. Cronbach's alpha = 0.85.

4.3.4. Avoidance of speech situations (T2)

The Stress and Response Questionnaire for Individuals Who Stutter [60] is a self-report tool measuring the intensity of stress and the extent of avoidance in different speech scenarios. We used the behavioral section to capture levels of avoidance behavior. Respondents are presented with 21 different speech-related situations, given four response options, and asked to select the one that most accurately reflects their behavior. Responses are scored on a scale where higher values denote a higher level of avoidance. For example: "I'm home alone, and suddenly the phone rings... What do I do? 1. I answer the call and speak. 2. I answer the call, but only reply with 'yes' and 'no'. 3. I hesitate to answer, and just as I decide to pick up, the ringing stops. 4. I hear the ring and decide not to answer."

Certain items were adapted to suit non-stutterers. For example, in the original measure, the item "I go to register for a sports class. The receptionist asks me for personal details such as my name and address. What do I do?" is followed by "I answer all the questions despite the stuttering and the discomfort, and even respond to additional personal questions that interest me". This item was changed to: "I answer all the questions, and even respond to additional personal questions that interest me". Cronbach's alpha = 0.87.

4.4. Plan of analysis

All statistical analyses were conducted using SPSS version 28, and Process version 4.2 ([61]).

First, to address H1a-H1c, we computed descriptive statistics, including means and standard deviations, for all variables. We then calculated Pearson correlation coefficients to assess bivariate associations between social anxiety (both adolescent- and parent-reported), identity formation (commitment, in-depth exploration, reconsideration), self-esteem, and avoidance of speech situations.

Second, to test H2 and H3 we performed a series of mediation analyses using Process macro in SPSS [61]. Based on studies showing differences in parental and child reports of the child's level of anxiety [62] and considering the relatively low association between parent and child reports on social anxiety (0.23), we computed mediation models separately for adolescent-reported and parent-reported social anxiety, for each identity outcome, with self-esteem and avoidance of speech situations as mediators. The total effect, direct effect, and indirect effects were calculated for each model. Indirect effects were tested using bootstrapping with 5000 resamples; 95 % confidence intervals (CIs) were used to determine statistical significance. To explore whether self-esteem and avoidance of speech situations functioned as sequential mediators in relations between social anxiety and identity components (H4), we used serial mediation models (model 6 in Process). We also measured alternative models in which the mediators' positions were switched (self-esteem followed avoidance of speech situations). Fig. 1 illustrates the hypothesized pathways linking social anxiety, self-esteem, avoidance of speech situations, and identity formation. Specifically,

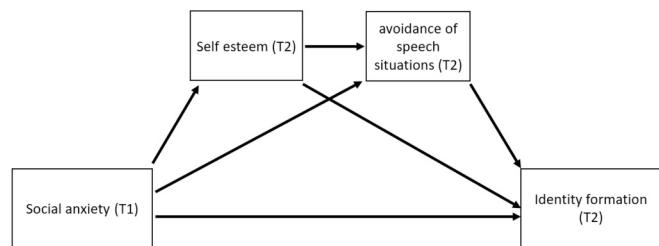


Fig. 1. Hypothesized model linking social anxiety, self-esteem, avoidance of speech situations and identity formation.

higher social anxiety at T1 was expected to predict lower self-esteem and higher speech avoidance at T2. In turn, lower self-esteem and greater speech avoidance were expected to predict weaker identity development processes. We also proposed a sequential indirect pathway, such that social anxiety would be associated with lower self-esteem, which in turn would predict greater speech avoidance, ultimately shaping identity processes.

5. Results

Table 1 presents Pearson correlation coefficients between study variables (H1a, H1b, H1c). There was a significant small correlation between adolescent-reported and parent-reported social anxiety. No significant associations were found between social anxiety and commitment (H1a), nor between social anxiety and in-depth exploration (H1b). In line with H1c, adolescent-reported social anxiety was positively associated with reconsideration.

Table 2 presents mediation results for the associations between social anxiety and commitment (H2, H3, H4). For adolescent-reported social anxiety, the total effect on commitment was significant, whereas the direct effect was not, indicating full mediation. Higher social anxiety predict lower self-esteem ($b = -0.22, p < .001, 95\% \text{ CI} [-0.31, -0.13]$), which in turn, was positively associated with commitment ($b = 0.36, p < .001, 95\% \text{ CI} [0.16, 0.57]$). Higher social anxiety predicted greater avoidance of speech situations ($b = 0.20, p < .001, 95\% \text{ CI} [0.12, 0.29]$), which in turn, was negatively associated with commitment ($b = -0.27, p = .02, 95\% \text{ CI} [-0.50, -0.04]$).

A similar pattern emerged for parent-reported social anxiety, with a significant total but nonsignificant direct effect, indicating mediation. Specifically, higher social anxiety reported by the parent was associated with lower self-esteem ($b = -0.15, p = .053, 95\% \text{ CI} [-0.30, 0.002]$), which in turn, was positively associated with commitment ($b = 0.35, p = .001, 95\% \text{ CI} [0.15, 0.56]$). Higher parent-reported social anxiety predicted greater avoidance of speech situations ($b = 0.20, p = .003, 95\% \text{ CI} [0.07, 0.33]$), and avoidance was negatively associated with commitment ($b = -0.24, p = .032, 95\% \text{ CI} [-0.46, -0.02]$). The direct effect of parent-reported social anxiety on commitment was not statistically significant ($b = -0.06, p = .544, 95\% \text{ CI} [-0.26, 0.14]$), suggesting relations between parent-reported social anxiety and commitment were primarily explained through indirect pathways.

Table 3 presents mediation results for in-depth exploration (H2, H3, H4).

Findings for the total effect of adolescent-reported social anxiety on in-depth exploration showed a weak negative association, while the direct effect was not statistically significant, suggesting the influence of social anxiety on in-depth exploration was primarily explained through indirect pathways. Higher social anxiety reported by adolescents was associated with lower self-esteem ($b = -0.22, p < .001, 95\% \text{ CI} [-0.31, -0.13]$), which in turn, was not significantly associated with in-depth exploration ($b = -0.10, p = .34, 95\% \text{ CI} [-0.30, 0.10]$). Higher social anxiety predicted greater avoidance of speech situations ($b = 0.20, p < .001, 95\% \text{ CI} [0.12, 0.29]$), and avoidance was negatively associated with in-depth exploration ($b = -0.27, p = .014, 95\% \text{ CI} [-0.49,$

Table 1

Pearson correlations between study variables.

Variable	M (SD)	1	2	3	4	5	6
1 Social anxiety (AR) T1	0.52 (0.47)	–					
2 Social anxiety (PR) T1	0.85 (0.74)	0.23**	–				
3 Commitment (AR) T2	3.54 (0.62)	–0.13	–0.12	–			
4 In-depth exploration (AR) T2	3.44 (0.56)	0.05	–0.03	0.50**	–		
5 Reconsideration (AR) T2	2.17 (0.74)	0.24**	0.07	–0.31**	–0.03	–	
6 Self-esteem (AR) T2	2.96 (0.46)	–0.34**	–0.14	0.32**	–0.04	–0.34**	–
7 Avoidance of speech situation (AR) T2	1.65 (0.44)	0.41**	0.26**	–0.27**	–0.13	0.30	–0.36**

Note. * $p < .05$, ** $p < .01$. N = 186. Significant associations are presented in bold. AR = Adolescent report; PR = Parent report. T1 = Time 1, T2 = Time 2.**Table 2**

Mediation of social anxiety (adolescent and parent reports) and commitment.

	Total Effect (Social anxiety - < Commitment)	Direct Effect (Social anxiety- > Commitment)	Relationship	Indirect Effect	Confidence Interval		t-statistics
					Lower Bound	Upper Bound	
AR	–0.149 (0.043)	0.034 (0.069)	Social anxiety - > Self-esteem- > Commitment Social anxiety- > Avoidance of speech situation- > Commitment Social anxiety - > Self-esteem- > Avoidance of speech situation- > Commitment Social anxiety - > Self-esteem- > Commitment Social anxiety - > Avoidance of speech situation- > Commitment Social anxiety- > Self-esteem- > Avoidance of speech situation- > Commitment	–0.080 –0.054 –0.014 –0.051 –0.048 –0.011	–0.142 –0.120 –0.039 –0.118 –0.115 –0.034	–0.029 –0.006 –0.000 –0.003 –0.000 0.001	–2.789 –1.909 –1.386 –1.75 –1.64 –1.207
PR	–0.111 (0.046)	0.060 (0.099)					

N = 186. AR = Adolescent report; PR = Parent report. Statistically significant indirect effects are presented in bold.

Table 3

Mediation of social anxiety (adolescent and parent reports) and in-depth exploration.

	Total Effect (Social anxiety - < In-depth exploration)	Direct Effect (Social anxiety- > In-depth exploration)	Relationship	Indirect Effect	Confidence Interval		t-statistics
					Lower Bound	Upper Bound	
AR	–0.048 (0.035)	0.092 (0.066)	Social anxiety- > Self-esteem- > In-depth exploration Social anxiety- > Avoidance of speech situation- > In-depth exploration Social anxiety- > Self-esteem- > Avoidance of speech situation- > In-depth exploration Social anxiety- > Self-esteem- > In-depth exploration Social anxiety - > Avoidance of speech situation- > In-depth exploration Social anxiety - > Self-esteem- > Avoidance of speech situation- > In-depth exploration	0.021 –0.055 –0.014 0.018 –0.048 –0.011	–0.016 –0.117 –0.037 –0.008 –0.111 –0.033	0.071 –0.008 –0.001 0.059 –0.001 0.000	0.977 –1.982 –1.505 1.04 –1.67 –1.233
PR	–0.041 (0.033)	0.004 (0.094)					

N = 186. AR = Adolescent report; PR = Parent report. Statistically significant indirect effects are presented in bold.

–0.06]). The direct effect of social anxiety on in-depth exploration was not statistically significant ($b = 0.09, p = .17$, 95 % CI [–0.04, 0.22]). These findings indicate an indirect pathway primarily through speech avoidance.

Findings for parent-reported social anxiety showed a weak negative association between social anxiety and in-depth exploration, while the direct effect was not statistically significant, indicating relations were primarily explained through indirect pathways. Higher parent-reported social anxiety was marginally associated with lower self-esteem ($b = –0.15, p = .053$, 95 % CI [–0.30, 0.002]), which in turn, was not significantly associated with in-depth exploration ($b = –0.12, p = .21$, 95 % CI [–0.32, 0.07]). Higher parent-reported social anxiety predicted greater avoidance of speech situations ($b = 0.20, p = .003$, 95 % CI [0.07, 0.33]), and avoidance was negatively associated with in-depth exploration ($b = –0.24, p = .025$, 95 % CI [–0.45, –0.03]). The

direct effect of parent-reported social anxiety on in-depth exploration was not statistically significant ($b = 0.005, p = .96$, 95 % CI [–0.18, 0.19]). Results suggest an indirect pathway through speech avoidance, with no independent mediation via self-esteem.

Table 4 presents mediation results for reconsideration (H2, H3, H4). For adolescent-reported social anxiety, the total effect on reconsideration was positive, while the direct effect was not significant. Specifically, higher social anxiety reported by adolescents was associated with lower self-esteem ($b = –0.22, p < .001$, 95 % CI [–0.31, –0.13]), which in turn, was negatively associated with reconsideration ($b = –0.41, p = .001$, 95 % CI [–0.65, –0.16]). Higher social anxiety predicted greater avoidance of speech situations ($b = 0.20, p < .001$, 95 % CI [0.12, 0.29]), and avoidance was positively associated with reconsideration ($b = 0.31, p = .024$, 95 % CI [0.04, 0.57]). The direct effect of social anxiety on reconsideration was not statistically significant ($b = 0.08, p = .318$, 95 %

Table 4

Mediation of social anxiety (adolescent and parent reports) and reconsideration.

	Total Effect (Social anxiety - < Reconsideration)	Direct Effect (Social anxiety- > Reconsideration)	Relationship	Indirect Effect	Confidence Interval		t- statistics
					Lower Bound	Upper Bound	
AR	0.168 (0.051)	0.082 (0.82)	Social anxiety - > Self-esteem- > Reconsideration Social anxiety - > Avoidance of speech situations- > Reconsideration Social anxiety - > Self-esteem- > Avoidance of speech situations- > Reconsideration Social anxiety PR - > Self-esteem- > Reconsideration Social anxiety - > Avoidance of speech situations- > Reconsideration Social anxiety - > Self-esteem- > Avoidance of speech situations- > Reconsideration	0.089 0.062 0.015 0.064 0.072 0.016	0.034 0.004 0.000 0.006 0.012 0.000	0.157 0.133 0.044 0.142 0.161 0.047	2.806 1.871 1.371 1.837 1.916 1.328
PR	0.153 (0.058)	-0.028 (0.117)					

N = 186. AR = Adolescent report; PR = Parent report. Statistically significant indirect effects are presented in bold.

CI [-0.08, 0.24]). The total indirect effect was significant ($b = 0.17$, BootCI [0.07, 0.28]), with specific indirect effects through both self-esteem ($b = 0.09$, BootCI [0.03, 0.16]) and avoidance of speech situations ($b = 0.06$, BootCI [0.004, 0.13]). The serial indirect effect through self-esteem and avoidance was also significant, although smaller in magnitude ($b = 0.02$, BootCI [0.001, 0.04]). It seemed the effect of social anxiety on reconsideration was fully mediated by self-esteem and avoidance of speech situations.

Similarly, for parent-reported social anxiety, the direct effect on reconsideration was not significant. Specifically, higher social anxiety reported by parents was marginally associated with lower self-esteem ($b = -0.15$, $p = .053$, 95 % CI [-0.30, 0.002]), which in turn, was negatively associated with reconsideration ($b = -0.44$, $p < .001$, 95 % CI [-0.68, -0.20]). Higher parent-reported social anxiety predicted greater avoidance of speech situations ($b = 0.20$, $p = .003$, 95 % CI [0.07, 0.33]), and avoidance was positively associated with reconsideration ($b = 0.36$, $p = .007$, 95 % CI [0.10, 0.62]). The direct effect of parent-reported social anxiety on reconsideration was not statistically significant ($b = -0.03$, $p = .81$, 95 % CI [-0.26, 0.20]). The total indirect effect was significant ($b = 0.15$, BootCI [0.05, 0.28]), with specific indirect effects through both self-esteem ($b = 0.06$, BootCI [0.006, 0.14]) and avoidance of speech situations ($b = 0.07$, BootCI [0.012, 0.16]). The serial indirect effect through self-esteem and avoidance was also significant, although smaller in magnitude ($b = 0.02$, BootCI [0.0003, 0.048]). It seemed the effect of social anxiety on reconsideration was fully mediated by self-esteem and avoidance of speech situations.

To assess the robustness of our mediation model, we tested alternative models by reversing the order of the mediators (self-esteem and avoidance of speech situations; Process, Model 6). Results were largely consistent with the hypothesized structure, supporting the validity of our model. Two exceptions emerged: in the adolescent-reported model predicting exploration, the reversed order eliminated the indirect effect, while in the parent-reported model predicting commitment, the reversed order produced a significant indirect effect not observed originally. Full details are in the supplementary materials (Tables S2-S4).

Finally, we conducted analyses in which we controlled for adolescent gender and age and parental education level. Results were consistent with the main analyses: the indirect effects were robust and statistically significant, whereas the direct effects of social anxiety on identity variables remained non-significant. Thus, the inclusion of these covariates did not alter the study's substantive conclusions.

6. Discussion

We examined the association of adolescents' social anxiety with identity formation across three dimensions, commitment, in-depth

exploration, and reconsideration of commitment, hypothesizing self-esteem and avoidance of speech situations as mediating mechanisms. Because of the study's longitudinal, multi-informant design, our findings offer insights into the psychological experiences and socio-behavioral tendencies through which social anxiety may shape identity formation.

Given the well-documented discrepancies between child and parent reports on socio-emotional health [63,64], we investigated separate models for adolescent-reported and parent-reported adolescent social anxiety. Although both informants assessed the same construct, their reports showed only a modest correlation ($r = 0.22$, $p < .01$), highlighting the importance of distinguishing between perspectives. Interestingly, however, the findings revealed greater similarity than divergence between the two informants.

6.1. Social anxiety and identity formation

We did not find significant direct associations between social anxiety, whether adolescent- or parent-reported, and the three identity dimensions, with one exception: a significant positive correlation emerged between adolescent-reported social anxiety and reconsideration of commitment six months later. These findings partially contradict H1's prediction of direct associations between social anxiety and both identity commitment and reconsideration. While previous studies found general anxiety was directly associated with disruptions in identity development [20,3], our findings suggest social anxiety may function differently. Social anxiety, as a context-specific and relational form of anxiety, may exert its effects less through direct disruption and more by undermining self-perceptions [39,35,37,65] and communicative engagement [43,44,45]. **Moreover, cognitive models conceptualize social anxiety as a heightened appraisal of social threat, shaped by self-perceptions of stigma and shame [66]. This perspective helps explain why socially anxious adolescents may interpret social situations as more threatening than they actually are, thus increasing their tendency towards low self-esteem and avoidance of speech situations. These processes provide an indirect mechanism through which social anxiety undermines identity consolidation, reinforcing the rationale for focusing on indirect effects and examining mediating mechanisms (self-esteem, speech avoidance) in the link between social anxiety and identity formation.**

6.2. Bridging social anxiety and identity formation through self-esteem and speech avoidance

Findings from our mediation models yielded consistent patterns across informants, supporting H2 and H3. Specifically, when either adolescents or parents reported higher levels of adolescent social anxiety at T1, it was significantly associated with lower self-esteem and greater

avoidance of speech situations six months later. In turn, both lower self-esteem and heightened avoidance of speech predicted lower identity commitment and greater reconsideration. These associations were fully mediated, suggesting the contribution of social anxiety to these aspects of identity is not direct, but operates through the two mechanisms. Notably, in the adolescent reports, both self-esteem and avoidance of speech situations served as independent and sequential mediators, suggesting internal evaluations and speech avoidance contribute uniquely (H2, H3, respectively) and cumulatively (H4) to the identity formation of socially anxious adolescents. Although we tested a sequential mediation pathway, examining the reversed-order model yielded no meaningful changes. This suggests that self-esteem and avoidance of speech situations each play a meaningful and distinct role in explaining how social anxiety relates to identity formation, rather than reflecting a unidirectional process in which one mechanism necessarily leads to the other. Thus, socially anxious adolescents may simultaneously experience diminished self-esteem alongside behavioral avoidance of speech-related situations—both of which can limit opportunities for the experiential and reflective processes essential to identity development [43,42]. Over time, these internal and behavioral struggles may affect their ability to commit to stable identity choices. Instead of feeling secure in who they are, they may second-guess themselves, re-evaluate their path, and remain in a prolonged state of uncertainty. In this sense, our study adds a critical layer to previous findings [17,20,67], by showing socially anxious adolescents may struggle to develop a stable sense of identity, not because of anxiety alone, but because of the self-doubt and avoidance it might foster.

We did not formulate a directional hypothesis for in-depth exploration (H3). We found a pattern of full mediation emerged only through avoidance of speech situations in both adolescent- and parent-reported models, suggesting adolescents who tend to avoid verbal engagement may be less inclined to explore their identity in depth. In contrast, self-esteem alone did not significantly mediate this association. According to identity development theories [1,14], in-depth exploration involves sustained reflection on commitments, often through internal dialogue and social interactions that challenge or refine existing identity positions. The finding that only avoidance of speech situations, and not self-esteem, mediated this association suggests behavioral withdrawal from verbal expression may act as a barrier. Adolescents who refrain from articulating thoughts, expressing opinions, or engaging in identity-relevant conversations may lack the opportunities they need to explore and discover their unique selves. This interpretation aligns with theoretical accounts emphasizing the role of communicative interactions in constructing identity [47,48] and with findings showing adolescents who avoid speaking can miss out on relational and reflective experiences central to identity formation [43,68]. Furthermore, adolescents may avoid exploration as a strategy to reduce anxiety [2]. In this sense, avoidance limits the dialogical and exploratory processes through which identity becomes coherent and self-endorsed. The absence of a mediating role for self-esteem further suggests the challenge is not merely how adolescents feel about themselves, but how they behaviorally navigate situations requiring verbal self-expression, especially those serving as catalysts for identity-exploration [69,49].

6.3. Strengths, limitations, and future directions

This study has several strengths. First, its longitudinal, multi-informant design strengthens the findings' depth and validity. By combining adolescent self-reports with parent reports, the study captures both internal and externally observable aspects of social anxiety. Second, it advances the understanding of anxiety's role in identity formation [20,3] by turning a spotlight on social anxiety, a relevant but understudied form of anxiety during adolescence [67]. Third, the focus on specific mediating mechanisms, self-esteem and avoidance of speech situations, adds a new layer to our understanding of how social anxiety contributes to identity formation, moving beyond direct associations to

explore developmental processes over time.

Nonetheless, several limitations must be acknowledged. First, Although the longitudinal design strengthens temporal interpretation, the two-wave structure limits our ability to draw strong causal inferences, particularly for complex mediation processes. Future research would benefit from incorporating additional waves of data collection and using cross-lagged panel models to more rigorously examine bidirectional and developmental relations between social anxiety, self-esteem, speech avoidance, and identity processes. Second, the mediators and identity outcomes were reported only at T2. Thus, the study does not capture within-person changes or indicate causality, and findings should be interpreted with caution. As identity formation is a prolonged, dynamic process unfolding over years [6,70], future research could use multi-wave longitudinal designs to assess key constructs, such as social anxiety, self-perceptions, speech avoidance, and identity processes, across multiple time points, enabling the modeling of developmental trajectories.

Second, despite broad similarities in mediation patterns across parent- and adolescent-reported models, some differences warrant attention. Indirect effects were generally stronger for adolescent-reported social anxiety, particularly for commitment and reconsideration; parent-reported anxiety showed weaker or marginally significant effects, especially in pathways involving self-esteem. This divergence may reflect adolescents' greater insight into their internal experiences. Given the normative shift towards autonomy in adolescence, the central role of peers [71], and the fact that adolescents spend a significant portion of their time in school, future research should incorporate additional informants, such as close friends, classmates, and teachers, to better capture social functioning.

Third, the sample consisted of adolescents from Israel, with most coming from highly educated families. Cultural and socioeconomic contexts can shape the way adolescents experience social anxiety and identity formation [33,72,73], possibly limiting the generalizability of our findings [67]. Future research should confirm this theoretical framework in broader populations. In particular, cross-cultural and cross-population studies are required to examine whether similar patterns emerge across diverse cultural and socio-demographic contexts.

Forth, parent reports were collected from mothers only. Relying exclusively on maternal reports may reduce generalizability, as research has shown mothers and fathers can differ in their reports of children's behaviors and psychological symptoms [74]. Future studies should include both mothers and fathers, or additional caregivers, to capture a broader and more nuanced perspective of adolescents' functioning.

Fifth, the broader social context in which adolescents develop warrants consideration. The digital era shapes adolescents' social experiences, potentially amplifying social anxiety through online evaluation and comparison, yet it may also provide safer spaces for self-expression and identity exploration [75,76]. Future research should investigate how digital contexts shape the mechanisms linking social anxiety, self-esteem, speech avoidance, and identity formation.

Sixth, we focused on mediating processes, but contextual factors such as educational status or family structure conditions may moderate these pathways. Future research should examine moderated mediation models across different contexts.

Finally, future studies could incorporate additional mechanisms to help explain the link between social anxiety and identity formation during adolescence. Factors such as the relationship quality with siblings and parents [17] and peer social support [77] may shape how socially anxious adolescents navigate social challenges and develop their identity. Examining them would provide a more comprehensive understanding of the pathways through which social anxiety relates to identity development.

6.4. Practical implications

Self-esteem and speech avoidance emerged as important mediators,

operating both independently and sequentially, suggesting interventions that simultaneously address internal processes (e.g., self-perception and self-esteem) and external behaviors (e.g., verbal avoidance) may support coherent identity development [69,42]. Early identification of these patterns would permit timely, targeted support [78]. Because speech avoidance is externally observable [79], educators are in a unique position to recognize early signs of difficulty. Students who consistently refrain from participating in class discussions or exhibit discomfort in verbal tasks may be silently contending with social anxiety [43]. Raising awareness among teachers, school counselors, and caregivers about such behavioral cues can promote earlier intervention for socially anxious adolescents at risk of disrupted identity development.

Evidence-based strategies to enhance adolescents' self-worth and support their identity formation could include behavioral intervention programs [80], cognitive behavioral group therapy [81], and participation in sports, particularly those emphasizing teamwork, achievement, and personal mastery [82]. In parallel, structured opportunities for verbal expression, such as guided dialogue [69] and narrative-based reflection [47], could help socially anxious adolescents engage with the reflective and dialogical processes critical for identity construction.

6.5. Conclusions

The findings suggest social anxiety relates to future adolescent identity formation primarily through indirect pathways, specifically through reduced self-esteem and increased avoidance of speech situations. Interventions should therefore attempt to strengthen adolescents' sense of self-worth and reduce their avoidance behaviors.

CRediT authorship contribution statement

Omer Levy Kardash: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Adi Arden:** Writing – review & editing, Writing – original draft. **Hanit Ohana:** Writing – review & editing, Writing – original draft. **Maya Benish-Weisman:** Writing – review & editing, Supervision, Methodology.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.comppsych.2026.152662>.

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