



Friends and Education: Identity Patterns across Domains and Associations with Emotion Dysregulation and Identity Disturbance

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Abstract

The task of identity development, which involves distinguishing who one is, and defining and articulating this to others, is a challenging developmental task for most youth. This is made even more challenging when one considers that there are multiple domains of identity development. In the current study, Australia adolescents ($N = 336$; aged 12–15 years, 46% male) reported their identity status commitment, exploration and reconsideration across two different domains (education and friendship). Cluster analysis was used to evaluate patterns of identity formation within and across domains, and the internalizing symptoms (low self-worth, emotion dysregulation, depressive and anxiety symptoms) and identity disturbance of clusters of youth with different identity status patterns were compared. Results revealed five clusters of committed explorers, committed non-explorers, committed reconsiders, uninvolved, and friend identifiers. Cluster comparisons revealed that, across self-worth, emotion dysregulation and identity disturbance, adolescents in the friend identifiers cluster, who reported high commitment to friendship identity and lower commitment to educational identity relative to their peers, fared worse than adolescents reporting higher than average commitment across both domains, and those reporting high reconsideration in both domains. These findings suggest that the benefit of identity commitment for emotional adjustment may depend somewhat on the domain under investigation, and that evaluating the junction and divergence of different identity domains might identify additional adolescents who are experiencing symptoms of maladjustment.

Keywords Identity · Adolescents · Education · Identity disturbance · Internalizing symptoms

Introduction

Identity, and the formation of a coherent conception of the self during adolescence, has been of longstanding interest across both developmental and clinical research, with good reason: the task of distinguishing who one is, and defining and articulating this to others, is a challenging but fundamental task during the transition from childhood to adulthood (Crocetti and Meeus, 2015; Erikson, 1968). In Erikson's classic Psychosocial Theory of Life Conflicts (1968), identity formation was described as a conflict, whereby "identity versus role confusion" highlights the struggle that exists when forming one's identity. During the

identity formation process, the balance between commitment and confusion about new roles can be tipped to favor uncertainty. Inspired by Erikson, Marcia (1966) created his identity-status model of four distinct categories of identity status, based on the absence or presence of exploration of identity and commitment to identity. Further to this, in his contemporary theory of identity development, Meeus (1996, 2001) has posited that, in adolescence and early adulthood, there can be more cycling though exploration and preliminary or firmer commitment than indicated by the focus on end states described in Marcia's model of identity statuses. This has culminated in support for a three-factor model of identity formation and reformulation that taps three pivotal processes of identity formation: commitment, in-depth exploration, and reconsideration of commitment (Crocetti et al. 2008b). "Commitment" relates to the degree to which the individual has made at least somewhat firm commitments to identity roles, while "in-depth exploration" captures the active examination of existing and potential commitments. "Reconsideration of commitment" taps the confusion of the identity formation processes, where current

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commitments are compared to potential alternatives, evaluated and abandoned, and includes efforts to change unsatisfactory commitments, and a rethinking of one's sense of self (Crocetti and Meeus 2015). Although these processes can be observed across many life domains, a measure of "global" identity can be obtained by combining an ideological domain, such as an educational/vocational, and a relationship domain, such as within the best friend relationship. These domains are considered to be especially relevant to identity formation in adolescence (Heaven et al. 2008).

The Three-Factor Model of Identity Formation and Associations with Well-being

Results of studies with adolescents that have utilised this three-factor model of identity formation suggest that greater identity commitment is associated with better well-being and adaptation. For example, when Dutch (Crocetti et al. 2008a, 2009) Italian (Crocetti et al. 2010, 2012a) and Japanese (Hatano et al. 2016) adolescents report more identity commitment, they also report fewer internalizing problems like depressive and anxiety symptoms, whereas when greater reconsideration of commitment is reported, this is associated with more problematic symptoms. Further, greater commitment has been found to be associated with less externalizing symptoms, while greater reconsideration was associated with more externalizing symptoms (Hatano et al. 2016). Moreover, greater identity commitment and less in-depth exploration have been associated with a more clear sense of self and more emotional stability (Crocetti et al. 2010). The relationship between in-depth exploration and internalizing symptoms is less clear, with research suggesting the existence of cultural differences. In Dutch and Italian samples (Crocetti et al. 2008b, 2010), in-depth exploration has been associated with more depressive and anxiety symptoms, whereas in a Japanese sample, in-depth exploration was associated with *fewer* internalizing symptoms.

Longitudinal research sheds further light on the associations between identity formation and symptomology. In particular, longitudinal research provides evidence of a bidirectional association between symptoms and identity commitment and reconsideration. For example, adolescents with more symptoms of anxiety not only started with higher reconsideration of commitment compared to their lower anxiety peers, but also reported lower commitment and higher reconsideration of commitment over time (Crocetti et al. 2009). In addition, in a study that separated education from friendship identity, relatively greater commitment to identity within the friendship domain was associated with decreases in depressive symptoms over adolescence (van

Doeselaar et al. 2018). Hence, evidence suggests that reconsideration of commitment over time, and both reconsideration of commitment and in-depth exploration in early adolescence, are linked to heightened internalizing symptoms. However, by early adulthood, in-depth exploration reported during adolescence has been found to be associated with psychological and social well-being and life satisfaction (Karás et al. 2015).

Domains of Identity Formation in the Three-Factor Model

Although some recent research is emerging that examines vocational/educational identity separate from social/friendship identity (e.g., van Doeselaar et al. 2018), much of the work utilizing this three-factor model of identity formation in typically developing adolescents relies on a "global identity" approach, meaning an adolescent's commitment, in-depth exploration, and reconsideration scores are compiled from collapsing across the two domains (e.g., Crocetti et al. 2008a, 2008b). Although this places a lens on a global identity formation processes, it is possible that these analyses have masked some differences in identity formation and its correlates in different domains or that patterns across domains may be relevant to understanding adolescent's well-being and functioning. It has been argued that the consideration of educational and friendship identity domains separately, but in relation to each other, allows for a better understanding of the *content* of identity alongside the *process* of identity formation (Syed and McLean 2015), as the two processes occur in adolescents concurrently, but can have their own unique challenges and timelines.

Support for attending to education and friendship, as separate but related aspects of identity formation, can be found in the literature. Italian adolescents (in grades 11 and 12) were observed to differ in commitment, in-depth exploration, and reconsideration of commitment when patterns were examined over the course of one academic year in these two domains, and that social identity informed personal identity over time (Albarello et al. 2017). Further, a study by Crocetti et al. (2012b) demonstrated that Italian adolescents' identity development in one domain could differ from the other domain. Participants in their study were clustered based on commitment, in-depth exploration, and reconsideration within each domain separately, and then categorized into four groups (stable in both domains, unstable in both, stable in education and stable in friendship) based on the two clustering procedures. Findings indicated that greater stability in both domains was associated with better mental health than instability in both, with stability in either domain associated with symptoms that fell between the two other groups. Lastly, a longitudinal, daily

examination of commitment, in-depth exploration, and reconsidering across the friendship and education domains found that adolescents considered to be in a crisis-like class in the friendship domain (i.e., relatively low commitment, high and stable commitment fluctuations, and relatively high and stable reconsideration) continued to experience instability and commitment fluctuations in this domain across adolescence, which was not a pattern found for those in a crisis-like class in the education domain (Becht et al. 2016). Hence, previous findings do suggest different patterns of identity formation across the two domains. However, no study has addressed this by considering the two domains concurrently in a single cluster analysis in order to compare adolescents with similar versus different identity formation patterns across the two domains.

Identity Formation and a Person-oriented Approach

Developmental research on identity has been conducted with both variable-oriented and person-oriented approaches, with person-oriented methodologies particularly useful in understanding complexity in identity formation (Crocetti and Meeus 2015). Variable-oriented approaches, which rely on aggregation of items or subscale scores, can fail to explain sufficient variance, and conclusions drawn from such analyses can unequally fit all individuals (von Eye 2010). Person-oriented approaches, which focus specifically on patterns within persons, can uncover information about the individual's characteristics that might help explain how the individual arrives at a certain outcome, as the focus of analysis is the individual, rather than the variable or outcome (von Eye et al. 2015). Person-oriented theory suggests that human behavior is dynamic, complex, and specific to the individual, and that multiple factors (and interactions of said factors) need be taken into account (Sterba and Bauer 2010).

Not surprisingly, person-oriented approaches have gained momentum in the field of developmental psychopathology (Bergman et al. 2003; Sterba and Bauer 2010). The developmental psychopathological framework posits that study of aberration informs normative development and vice versa, and considers both that multiple pathways may lead to similar outcomes, be they adaptive or maladaptive, and conversely, a variety of outcomes can result from a given pathway (Cicchetti and Rogosch 1996). As person-oriented approaches focus on individual characteristics and are inclusive of complex interactions of factors (Sterba and Bauer 2010), they can uncover patterns of behavior and development that might suggest indicators of typical or atypical development (Von Eye et al. 2015). Hence, a person-oriented approach can be important for a better understanding of complex behavioral and developmental patterns.

Person-oriented approaches have been utilised with the three-factor model of identity, although these methods usually collapse across the education and friendship domains, or are conducted in these domains separately (Klimstra et al. 2011). Previous person-oriented approaches have replicated Marcia's identity status paradigm (see Crocetti and Meeus 2015 for review), where clusters of adolescents are described as having an identity status of "achievement", "early closure" (foreclosure), "moratorium", "searching moratorium" (high in commitment, exploration, and reconsideration) or "diffusion", these studies have collapsed across the domains of education and friendship identity. However, prior research suggests that development within the two domains of education and friendship identity differs across adolescence (Becht et al. 2016; Becht et al. 2017) and young adulthood (Vosylis et al. 2018). Over adolescence, problematic identity patterns in the interpersonal domain seem to persist (Becht et al. 2017), and the relevance of domains into early adulthood appears to shift as developmental tasks move from vocational pursuits to establishing intimate and loving relationships with others (Vosylis et al. 2018). Further, commitments within the interpersonal domain have been found to predict decreases in depressive symptoms, while adolescents reporting relatively stronger commitments in the education domain reported less stressful life events across adolescence (van Doeselaar et al. 2018). Taken together, these findings suggest that an average or summed level of commitment, in-depth exploration or reconsideration of commitment across domains may miss important patterns across domains in relation to each other.

The process of exploring and making commitments to education or vocational training is a self-driven and intra-personal process that is informed via an individual's seeking out and integrating personally relevant information based on personal goals, values, and desires, to inform a choice or pathway that the individual can then pursue, before reassessing the appropriateness of such a choice. However, exploring, committing and reconsidering commitment within the friendship domain is dyadic and interpersonal in nature, requiring the input, compliance, and interaction of an autonomous "other" whom potentially (and likely) has differing goals, values, and desires. Although previous findings have justified evaluating the domains of education and friendship separately (Becht et al. 2016 in adolescents; Vosylis et al. 2018 in young adults), identity development across the two domains does not occur as isolated processes, but rather co-occur and are then integrated across contexts (Waterman 2015). Therefore, keeping the domains of education and friendship identity separated, while still considering them simultaneously in relation to each other while using a person-oriented approach, is more closely

aligned with how identity formation processes are theorized to occur.

Problems with Identity: Clinical Research Outcomes

The periods of life where identity development is most relevant, adolescence and the transition to adulthood, are also critical periods in the course of developing psychopathology (Schulenberg et al. 2004). Importantly, personal identity has also been identified as a key factor in psychopathology (Klimstra and Denissen 2017), and preliminary findings utilizing small samples of adolescent boys in institutionalised delinquency and child protection settings suggest that adolescent males in penitentiary settings exhibited lower commitment across both the educational and friendship domains, and exhibited more difficulties in identity achievement compared to a matched community sample (Klimstra et al. 2011). Links have been established, both cross-sectionally and longitudinally, between high identity reconsideration and symptoms of depression and anxiety in typically developing adolescents and young adults in European (Crocetti et al. 2012a; Mercer et al. 2017; Morsunbul et al. 2016) and Japanese (Hatano et al. 2016) samples. Further, having an unstable or changing sense of self is a criterion for multiple mental health disorders, namely personality disorders like borderline personality disorder, trauma-related anxiety disorders, and dissociative disorders (see DSM-5; APA 2013). A better understanding of how, within the normative process of defining one's identity, symptoms of pathology can arise, has increasingly become the goal of developmental and clinical researchers (Josselson and Flum 2015, Klimstra and Denissen 2017). Consideration of clinical research on problematic identity formation and symptoms of psychopathology is useful in contributing to this goal.

Identity formation has been evaluated in clinical studies of adolescents and young people experiencing mental health problems, most commonly within Borderline Personality Disorder (BPD) and its key feature of identity disturbance. Identity disturbance, described by the DSM-5 as a persistent unstable and often negative self-image with sudden changes to sense of self including changing values and goals that may include a sense of emptiness or no identity at all (APA 2013), has been evaluated primarily in adult populations, and could be considered a result or outcome of pathological identity formation in adolescence and young adulthood. Identity disturbance has been found to be associated with emotion dysregulation (Neacsiu et al. 2015), affective instability (Koenigsberg et al. 2001), and anti-social traits (Chabrol and Leichsenring 2006) in clinical and typical populations of adults. Further, greater identity disturbance has also been found to be associated with more symptoms

of depression and anxiety across the adult age span (Bogaerts et al. 2018). Together, this research suggests that, whether in clinical populations or in typically developing populations, the trait of identity disturbance is associated with more symptoms of psychopathology, and might be a reliable indicator of problematic identity formation.

Finally, clinical theory on personal identity formation in BPD suggests that friendship identity, or how one sees themselves in the context of relationships with others, is impaired. A key feature of BPD, difficulty with interpersonal relationships, is theorized to be associated with personal identity, where a borderline personality presentation is thought to be evidence of impairment of the ability to maintain and integrate nonthreatening internal images of the self and others (Bender and Skodol 2007). This might suggest a discernible pattern in how young people commit, explore, and reconsider their identity in terms of their interpersonal relationships with others that is more, or less, problematic to their mental health, especially when compared to education identity.

The Current Study

The overarching purpose of the current study was to understand individual differences in identity formation across the education and friendship domains in a sample of Australian adolescents, and to understand whether different or similar patterns of commitment, in-depth exploration, and reconsideration of commitment across these two domains help to identify adolescents with elevated symptoms of emotional disorders, including self-worth, emotion dysregulation, symptoms of depression and social anxiety, and identity disturbance. This age range was chosen due to the Australian education and vocational context, which finds young people preparing for and choosing pathways of education or vocational training mid-way through their high school education. Due to theory and findings that suggest the friendship domain as a more “open” domain with more opportunities to make commitments (Albarello et al. 2017), it is hypothesized that adolescents will report higher commitment in the friendship compared to the education domain, but will report more in-depth exploration and reconsideration of commitment in the education domain compared to the friendship domain (Hypothesis 1). Due to previous findings that highlight the importance of commitment in relation to problematic symptoms (Crocetti et al. 2008b; Klimstra et al. 2011), and the fluctuations in commitments that can occur within the friendship domain (Becht et al. 2016), it is hypothesized that commitment in the education domain is most positive for mental health, so that adolescents with higher commitment in the education

domain will be highest in self-worth and lowest in symptoms of emotion dysregulation, social anxiety, depression, and identity disturbance, relative to other clusters (Hypothesis 2). Lastly, in line with previous findings that reconsideration is problematic for mental health symptoms such as depression and anxiety (Crocetti et al. 2008b; Crocetti et al. 2009), it is hypothesized that high reconsideration of commitment, across either the education or the friendship domain, will be associated with more symptoms of emotional problems, (i.e., lower in self-worth, and higher in symptoms of emotion dysregulation, social anxiety, depression, and identity disturbance; Hypothesis 3). Maintaining the education and friendship identity domains as separate dimensions, while still considering them concurrently relative to each other and evaluating these patterns of associations with symptoms is a unique approach. This meant that we did expect to find somewhat novel groupings of adolescents when the three identity process subscales of these two domains (six measures of identity processes in total) were subjected to cluster analysis.

Methods

Participants

Participants were 336 students (46% male) from three independent secondary schools in an urban area of Australia. Participants were aged 12–15 years ($M_{\text{age}} = 13.91$ years, $SD = 0.85$) and were predominantly white/Caucasian (76.7%) or Asian (15.9%). This study was conducted from data collected in a fifth and final wave of a longitudinal study, when a measure of identity was first included (original time 1 $N = 387$).

Procedure

Study approval was obtained from the university Human Research Ethics Committee before school principals were contacted for approval to conduct the study. Students were given parental consent forms to take home and return to the school. Some parents (16%) actively declined participation, and 42% of students failed to return their consent forms. One parent of each child was asked to complete a survey (to report demographic information, and his or her child's pubertal development and temperament) to return along with the consent form, which may have been the reason for the lower return of consent forms. A small gift (e.g., novelty pen, sticker) was given to participating students after survey completion. Students were able to decline participation on the day of the survey, but no student declined.

Measures

Identity formation processes

The Utrecht-Management Identity Commitments Scale (U-MICS; Crocetti et al. 2008b) was utilised to measure identity formation: identity commitment (5 items), in-depth exploration (5 items), and reconsideration of commitment (3 items). Two versions of the subscales were used, one to assess the education domain and one to assess the friendship domain, with items across the versions matched for language. Example items include: “My education/best friend makes me feel sure of myself” (commitment in education/friendship domain); “I often think about my education or training choices/best friend” (in-depth exploration in education/friendship domain); and “I often think it would be better to try to find different education or training choices/find a different best friend” (reconsideration of commitment in education/friendship domain). Participants responded to how true these statements were for them from 1 (*completely untrue*) to 5 (*completely true*). Items were averaged across each domain and subscale, with higher scores indicating greater commitment, in-depth exploration, or reconsideration of commitment. In the present study, Cronbach's α within the education domain were 0.90 (commitment), 0.70 (in-depth exploration), and 0.73 (reconsideration of commitment), and for friendship, 0.90 (commitment), 0.77 (in-depth exploration), and 0.81 (reconsideration of commitment).

Low self-worth

Five items from the Self-Perception Profile for Adolescents (Harter 2012) were used to measure adolescents' global self-worth (e.g., “Some teenagers like the kind of person they are BUT other teenagers often wish they were someone else”). Participants selected which description they were most like and then indicated if the description was “really true” or “sort of true”. Items were reversed when needed and averaged, with higher scores indicating lower self-worth. Cronbach's α was 0.85.

Emotion dysregulation

The 36-item Difficulties with Emotion Regulation Scale (DERS; Gratz and Roemer 2004) was utilised to measure the extent of participants' difficulties in regulating their emotions. Although the scale consists of six subscales (non-acceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity), only the composite

score of overall emotion regulation was utilized. Sample items include “When I am upset, I take time to figure out what I’m really feeling” and “I have no idea how I am feeling”, with responses from 1 (*almost never*) to 5 (*almost always*). Some items were reverse-scored, before items were averaged so that higher scores indicated greater emotion dysregulation. Cronbach’s α was 0.91.

Depressive symptoms

Symptoms of depression were measured using the 13-item Short Mood and Feelings Questionnaire (SMFQ; Angold et al. 1995). Participants indicated how true statements were for them, such as “I felt I was no good anymore”, on a scale from 1 (*not true*) to 5 (*very true*). Items were averaged to form a total score, with higher scores indicating more symptoms of depression. Cronbach’s α was 0.96.

Social anxiety symptoms

Symptoms of social anxiety were measured using the 18-item Social Anxiety Scale for Adolescents (SAS-A; La Greca and Lopez 1998). Participants reported on their subjective experiences of social anxiety by responding to descriptive self-statements (e.g., “I feel that others don’t like me”) on a scale from 1 (*not at all true*) to 5 (*very true*). Responses were averaged across all items, and higher scores indicated more symptoms of social anxiety. Cronbach’s α was 0.94.

Identity disturbance

The 7-item Borderline Identity Disturbance Self-report (BIDS; Herr et al. 2014) was utilised to measure the borderline personality feature of identity disturbance. Identity disturbance has been described as “markedly and persistent unstable self-image or sense of self” (APA 2013, p. 664), and the measure indicates the extent to which participants experience markers of identity disturbance. Sample items include “I feel empty inside” and responses ranged from 1 (*The statement is FALSE or NOT AT ALL like me*) to 4 (*The statement is VERY TRUE or ALMOST EXACTLY like me*), with higher scores indicating more identity disturbance. Cronbach’s α was 0.89.

Overview of the Data Analyses

Descriptive statistics were computed for all study variables and tests were completed to identify outliers. Identity commitment, in-depth exploration and reconsideration of commitment in the two domains were compared using paired *t*-tests. Standardised *z*-scores were computed for the subscales of commitment, in-depth exploration, and

Table 1 Descriptive Statistics for all Study Variables ($N = 505$)

	<i>M</i> (SD)
Identity measures, unstandardized	
Education: commitment	3.24 (1.02)
Education: in-depth exploration	2.84 (0.92)
Education: reconsideration of commitment	2.19 (0.97)
Friendship: commitment	3.48 (1.00)
Friendship: in-depth exploration	3.00 (0.90)
Friendship: reconsideration of commitment	1.80 (0.94)
Symptom measures	
Low self-worth	1.77 (0.74)
Emotion dysregulation	2.32 (0.66)
Depressive symptoms	1.69 (0.85)
Social anxiety symptoms	2.22 (0.83)
Identity disturbance	1.58 (0.63)

reconsideration of commitment for the education and friendship domain, so that six standardised identity scores were utilised in the data-driven cluster analysis. ANOVA and MANOVA were then used to compare clusters on all relevant measures.

Results

Differences in Identity Formation between Domains

Descriptive statistics for all study variables (unstandardized scores) are provided in Table 1. Three paired *t*-tests were conducted to compare commitment, in-depth exploration, and reconsideration of commitment across the education and friendship domains for the entire sample. As hypothesised, significantly greater commitment was reported in the friendship domain ($M = 3.48$, $SD = 1.00$) compared to the education domain ($M = 3.24$, $SD = 1.02$), $t(335) = -3.83$, $p < 0.001$. Further, significantly greater reconsideration of commitment was reported in the education domain ($M = 2.19$, $SD = 0.97$) compared to the friendship domain ($M = 1.80$, $SD = 0.94$), $t(335) = 6.40$, $p < 0.001$. Contrary to our hypotheses, significantly greater in-depth exploration was reported in the friendship domain ($M = 3.00$, $SD = 0.90$) compared to the education domain ($M = 2.84$, $SD = 0.92$), $t(335) = -2.95$, $p = 0.003$.

Clustering

Using recommendations for best practice in cluster analysis (Gore 2000), the data file was randomly ordered and a 2-step clustering procedure was utilised. The first step included a hierarchical cluster analysis using Ward’s method of

Table 2 Descriptive statistics and pairwise comparisons of standardized scores of cluster groups ($N = 335$)

	Cluster 1 Committed explorers ($n = 83$) M (SD)	Cluster 2 Committed non- explorers ($n = 79$) M (SD)	Cluster 3 Committed reconsiders ($n = 48$) M (SD)	Cluster 4 Uninvolved ($n = 68$) M (SD)	Cluster 5 Friend identifiers ($n = 58$) M (SD)	$F(4,330)$	η^2	Differences ^a
Education: commitment	0.91 (0.63)	0.30 (0.60)	0.35 (0.77)	-0.96 (0.73)	-0.88 (0.62)	106.64*	0.56	1 > 2, 3, 4, 5 2 > 4, 5 3 > 4, 5
Education: in-depth exploration	0.96 (0.54)	-0.20 (0.69)	0.72 (0.79)	-1.0 (0.61)	-0.52 (0.74)	105.66*	0.56	1 > 2, 4, 5 3 > 2, 4, 5 2 > 4 5 > 4
Education: reconsideration of commitment	-0.11 (0.90)	-0.64 (0.58)	0.90 (0.93)	-0.48 (0.60)	0.85 (0.91)	52.78*	0.39	3 > 1, 2, 4 5 > 1, 2, 4 1 > 2, 4
Friendship: commitment	0.90 (0.58)	-0.10 (0.76)	0.02 (0.85)	-1.17 (0.72)	0.20 (0.75)	77.55*	0.48	1 > 2, 3, 4, 5 2 > 4 3 > 4 5 > 4
Friendship: in-depth exploration	0.70 (0.79)	-0.46 (0.66)	0.63 (0.82)	-1.00 (0.70)	0.30 (0.80)	67.27*	0.45	1 > 2, 4, 5 3 > 2, 4 5 > 2, 4 2 > 4
Friendship: reconsideration of commitment	-0.54 (0.43)	-0.47 (0.51)	1.70 (0.85)	-0.03 (0.93)	0.03 (0.70)	95.59*	0.54	3 > 1, 2, 4, 5 5 > 1, 2 4 > 1, 2

^aFor group differences: an example is 1 > 2, 3, 4, 5 indicates that 1 > 2, 1 > 3, 1 > 4, and 1 > 5

* $p \leq 0.001$

squared Euclidian distances. Evaluation of Schwarz's Bayesian criterion (BIC) indicated a 5-group cluster as the best fit (BIC for 4 clusters = 1224.14, for 5 clusters = 1214.83, and for 6 clusters = 1221.75). In the second step, an iterative k-means clustering procedure was utilised with two, three, four, five, and six clusters specified. These cluster groups were compared for theoretical meaningfulness, parsimony and explanatory power (Milligan and Cooper 1985). A five-cluster solution was determined as most acceptable, as the six-cluster solution generated two variations of a similar cluster, and a four-cluster solution failed to explain as much variance as a the five-cluster solution. Therefore, the k-means five-cluster solution was utilized in the current study.

Multivariate analyses of variance (MANOVA) with Tukey post hoc tests on the z-scores of each identity dimension for each domain (education and friendship) determined that, for the education domain, the 5-cluster solutions accounted for 56% of the variance in commitment, 56% of the variance in in-depth exploration, and 39% of the variance in reconsideration of commitment. For the friendship domain, the 5-cluster solution accounted for 48% of the variance in commitment, 45% in in-depth exploration, and 54% in reconsideration of commitment.

Cluster Group Differences

Identification of the clusters and verification of identity differences

The five identity formation clusters are described in Table 2 and graphically represented in Fig. 1. One-way ANOVAs with pairwise comparisons (Table 2) evaluated cluster mean differences on commitment, in-depth exploration, and reconsideration of commitment across the two domains. *Committed explorers* ($n = 83$) and *committed non-explorers* ($n = 79$) have above average commitment and below average reconsideration of commitment across domains, with either above average in-depth exploration (*committed explorers*) or below average in-depth exploration (*committed non-explorers*).

Committed reconsiders ($n = 48$) were markedly high in both domains for reconsideration of commitment and scored above average on commitment in the education domain, but were average in commitment in the friendship domain. Further, they scored above average in in-depth exploration in both domains. *Uninvolved* ($n = 68$) scored far below average in commitment and in-depth exploration in both domains, and reported below average reconsideration in the

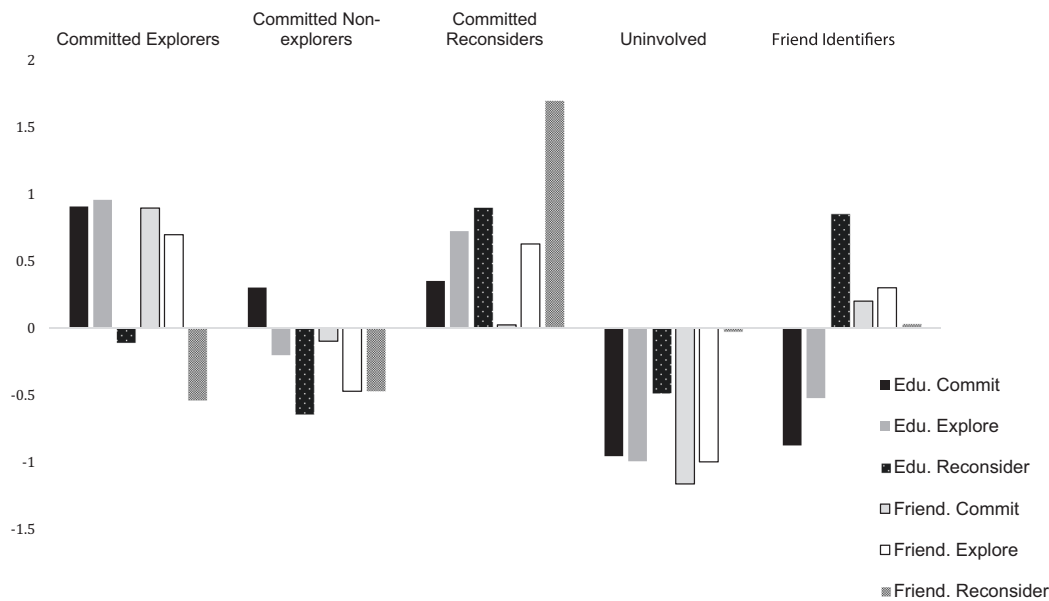


Fig. 1 Cluster profiles of identity commitment, in-depth exploration, and reconsideration of commitment by domain

education domain and average reconsideration in the friendship domain. Lastly, *friend identifiers* ($n = 58$) scored well below average in commitment and in-depth exploration but well above average in reconsideration of commitment in the education domain, and had above average commitment and average reconsideration of commitment in the friendship domain, especially relative to their levels of commitment in the education domain.

Further analyses were conducted to verify that differences across the two domains of education and friendship were significant between the clusters. Firstly, subscale scores for identity commitment, in-depth exploration, and reconsideration were summed across the two domains, resulting in a “total” score for each of the identity formation processes. Secondly, the discrepancy of scores across the two domains in commitment, in-depth exploration, and reconsideration of commitment were calculated and compared across clusters with multiple pairwise comparisons. For example, for each cluster, the mean for commitment in the education domain was subtracted from the mean commitment score in the friendship domain, so that higher discrepancy scores indicate less consistency across the two domains. The total scores, and discrepancy scores, were compared separately for each cluster using ANOVA with pairwise comparisons.

For the dimension of commitment, the committed explorers were significantly higher in commitment, and the uninvolved were significantly lower in commitment, compared to all other clusters. In terms of discrepancy in commitment between education and friendship domains, the committed explorers (the least discrepant cluster) and the uninvolved were significantly less discrepant (i.e., more

consistent) across the education and friendship domains than the friend identifiers. Evaluating this high discrepancy in commitment between the two domains in the friend identifiers cluster, friend identifiers committed more highly within the friendship domain compared to education domain.

For the dimension of in-depth exploration, the committed explorers and committed reconsiderers were the highest scorers, the uninvolved were the lowest scorers, and the committed non-explorers and friend identifiers fell between these clusters and were not significantly different. In terms of discrepancy between exploring in education versus friendship domains, friend identifiers were greater in discrepancy compared to the uninvolved, but did not differ from other clusters. However, friend identifiers were greater in in-depth exploration within the friendship domain compared to education, whereas other cluster groups’ discrepancies reflected the opposite pattern, with more in-depth exploration reported in education domain than friendship.

Finally, for the dimension of reconsideration of commitment, the committed reconsiderers cluster was indeed the highest in reconsideration compared to all other clusters, while the committed non-explorers were the lowest. Friend identifiers were significantly higher in overall reconsideration of commitment than uninvolved and the committed explorers and committed non-explorers. For discrepancy between the two domains, friend identifiers did not differ in their discrepancy compared to all clusters with the exception of committed non-explorers who had the least amount of discrepancy in reconsideration of commitment across the domains. However, further investigation revealed that friend identifiers had higher reconsideration of commitment

Table 3 Measures of low self-worth, emotion dysregulation, and symptoms for each cluster group ($N = 335$)

	Committed explorers ($n = 83$) M (SD)	Committed non-explorers ($n = 79$) M (SD)	Committed reconsiders ($n = 48$) M (SD)	Uninvolved ($n = 68$) M (SD)	Friend identifiers ($n = 58$) M (SD)	$F(4,330)$	η^2	Differences ^a
Low self-worth	1.54 (0.56)	1.51 (0.64)	1.81 (0.78)	2.04 (0.81)	2.10 (0.74)	10.98**	0.12	5 > 1, 2 4 > 1, 2
Emotion dysregulation	2.17 (0.71)	2.11 (0.61)	2.47 (0.70)	2.35 (0.57)	2.64 (0.57)	7.58**	0.08	5 > 1, 2 3 > 2
Depressive symptoms	1.64 (0.82)	1.45 (0.66)	1.87 (1.05)	1.65 (0.79)	2.00 (0.89)	4.39*	0.05	5 > 2
Social anxiety symptoms	2.28 (0.90)	2.07 (0.78)	2.18 (0.80)	2.15 (0.74)	2.45 (0.88)	2.09	0.03	–
Identity disturbance	1.48 (0.49)	1.41 (0.47)	1.75 (0.83)	1.47 (0.53)	1.96 (0.75)	9.29**	0.10	5 > 1, 2, 4 3 > 2

^aFor group differences: an example is 5 > 1, 2 indicates that 5 > 1 and 5 > 2

* $p < 0.05$. ** $p < 0.01$

in the education domain compared to the friendship domain, while most other clusters (with the exception of committed explorers) had the opposite pattern (i.e., greater reconsideration of commitment in the friendship domain).

Age and gender

The clusters were compared to test for age and gender differences. One significant age difference was found, where committed explorers were slightly older than committed non-explorers (mean difference of 4.6 months). A χ^2 test determined that clusters did not significantly differ in their gender distribution, $\chi^2(4, N = 336) = 9.41, p = 0.052$.

Identity cluster differences in self-worth, emotion dysregulation, and symptoms

As can be seen in Table 3, one-way ANOVAs with pairwise comparisons and Bonferroni corrections were utilised to evaluate mean differences across the five clusters on self-worth, emotion dysregulation, symptoms of depression and anxiety, and identity disturbance. For self-worth, committed explorers, committed non-explorers, and committed reconsiders, had significantly higher self-worth compared to the other two clusters. Committed reconsiders, uninvolved and friend identifiers did not significantly differ in reported self-worth.

For emotion dysregulation, the committed explorers and committed non-explorers had the lowest emotion dysregulation and friend identifiers had the highest, and the committed explorers and committed non-explorers clusters were significantly lower in emotion dysregulation than the friend identifiers. Although the means for committed reconsiders and uninvolved fell in between the other clusters, these clusters did not differ significantly from either the

committed explorers or friend identifiers. The committed non-explorers were significantly lower in emotion dysregulation than the uninvolved.

For depressive and anxiety symptoms, few differences were found. Committed non-explorers reported the lowest level of depressive symptoms and friend identifiers the highest, with the comparison of these two clusters revealing the only significant difference for depression. No cluster differences were observed for social anxiety.

Lastly, committed explorers and non-explorers and the uninvolved cluster had the least identity disturbance, and committed reconsiders and friend identifiers had the most. Moreover, the committed explorers and committed non-explorers clusters and the uninvolved had significantly less identity disturbance than friend identifiers, and committed non-explorers had significantly less identity disturbance compared to the committed reconsiders. The committed reconsiders and friend identifiers did not differ in identity disturbance.

Discussion

The challenging task of identity formation in adolescence has been demonstrated to occur somewhat differently across the developmentally relevant domains of education and friendship identity (Albarello et al. 2017; Crocetti et al. 2012a, 2012b). Although the identity formation processes of commitment, in-depth exploration, and reconsideration of commitment are associated with symptoms of mental health difficulties (Crocetti et al. 2008a, 2008b, 2010, 2012a, 2012b; Hatano et al. 2016), patterns in these processes, across these separate but related domains, have not been investigated previously. The purpose of the current study was to understand person-level patterns of identity

formation by clustering adolescents based on reports of commitment, in-depth exploration, and reconsideration of commitment within the two separated domains of education identity and friendship identity. Clusters were then compared on measures of self-worth, emotion dysregulation, symptoms of depression and social anxiety, and identity disturbance. Previous studies has evaluated stability in identity in separate domains (Becht et al. 2016; Crocetti et al. 2012b), and the influences of each domain on each other (Albarello et al. 2017) however no study has evaluated the processes of commitment, in-depth exploration, and reconsideration of commitment across the two domains concurrently. Hence, this is the first study to consider these identity domains separately and evaluate associations with symptoms of mental health problems, including identity disturbance, a measure of problematic identity formation.

Associations between Identity Clusters and Symptoms

Overall, results of the current study supported most of the hypotheses, but there were some surprising findings. First, in support of our hypotheses, commitment was higher in the friendship domain than in the academic domain, supporting previous work that has posited the friendship domain as more “open” with more options for commitment (Albarello et al. 2017). Further, clusters fared better in terms of measured symptoms when commitment was higher and reconsideration of commitment was lower (across either domain). The cluster lowest in symptoms of mental health problems, the committed non-explorers, engaged in significantly less in-depth exploration than committed explorers. This cluster of committed non-explorers is most similar to Marcia’s foreclosed identity status, where adolescents have made identity commitments with little exploration (Marcia 1966). Other person-centered approaches utilizing the three-factor model of identity, that collapse across the two domains before using cluster analysis to identity groups, reported a similar group (“early closure” Crocetti et al. 2008a, 2012b). Previous research suggests that youth categorized as in foreclosure or early closure will continue to remain stable in their commitments over time (Meeus et al. 2010), and continue to have lower symptoms of mental health problems. However, foreclosed individuals can find themselves in crisis when there are shifts in their environment or changes to their obligations (Marcia 1966). Indeed some mixed-method longitudinal research suggests that, despite consistencies in commitments, foreclosed individuals can experience distress in terms of uncertainty with firmly held choices, and may grapple with exploration of such commitments at later and more precarious stages of development (Zimmer-Gembeck and Mortimer 2006).

Also as hypothesized, the clusters highest in reconsideration of commitment in either the education or the friendship domain reported some of the highest levels of mental health symptoms. Reconsideration of commitment aims to tap the crisis that can occur in the identity formation process, where current commitments are compared to potential alternatives, evaluated and potentially abandoned (Crocetti and Meeus 2015). Such rethinking of one’s sense of self may result in a young person feeling anchorless and distressed, and leave them at greater risk for mental health problems. Alternatively, such symptoms may lead to feelings of self-doubt and uncertainty, where the young person than reconsiders previous commitments. In the current study, the cluster with the highest reconsideration of commitment (committed reconsiders) ranked second highest in mental health symptoms, and were not significantly different to the cluster reporting the highest levels of all reported symptoms (i.e., friend identifiers). These findings are consistent with past research that has found high reconsideration of commitment (collapsed across domains) to be associated with symptoms of mental health issues (Crocetti et al. 2008b, 2010; Morsunbul et al. 2016), however, the exact nature of these issues is different in this study compared to this previous work, as differences in depressive symptoms and anxiety symptoms were fewer than expected.

Further, social anxiety not differing across the clusters was a surprising finding in the current study. Despite clusters differing in terms of their commitment, in-depth exploration, and reconsideration of commitment within the friendship domain, it appears that social anxiety is not associated with identity cluster patterns, even in young people who may commit more in the friendship domain than in the education domain. Social anxiety has been shown to be higher in Italian adolescents with instability in both domains or in just the friendship domain (Crocetti et al. 2012a), however, future research is necessary to understand why, in this sample of young Australians, social anxiety did not differ according to identity process patterns. Social anxiety may be a more common experience in adolescents than previously thought, possibly do to extensive use of social media and associated concerns of evaluation from others (Twenge 2017). Thus it may be that social anxiety is associated with experiences other than identity development and hence did not differ across the identity patterns observed in the current study.

Friend Identifiers

The novel cluster of adolescents (friend identifiers) found in this study reported less reconsideration of commitment than committed reconsiders, especially in the friendship domain, yet they did not significantly differ from committed reconsiders on their high levels of most mental health

symptoms. Friend identifiers' reports of higher symptoms, on average, suggest that patterns of commitment and reconsideration across domains, specifically moderate commitment and low reconsideration in friendship domain and low commitment and high reconsideration in the education domain, are as problematic to mental health as is highly reconsidering one's identity across both domains. Although previous research has demonstrated that high commitment and low reconsideration (collapsed across both domains) is associated with less symptoms like depression and anxiety and less delinquent behavior (Crocetti et al. 2008b, 2009), and greater life satisfaction (Karaš et al. 2015) the current study's unique finding would suggest that evaluating how commitments, and reconsideration of such commitments, occur across domains can assist in understanding problems within the process of identity formation and the challenges experienced by adolescents who are reporting more mental health concerns. Previous longitudinal findings suggest strengthening commitments within the interpersonal domain are associated with small relative decreases in depressive symptoms over time (van Doeselaar et al. 2018). It is possible that considering the two domains relative to each other reveals a more complex relationship between commitment and symptomology, however, as the current study is cross-sectional, it may also be that the current study's association does not persist into later adolescence. Regardless, inconsistencies across domains, as found in the friend identifiers cluster, warrant further study, as they might be relevant to the broader understanding of identity formation difficulties, such as those found in personality disordered clinical populations.

Understanding of Identity and Mental Health

The results of the current study are unique from previous literature evaluating identity formation in adolescence in three key ways. First, past studies have collapsed across the two identity domains or have not considered them concurrently in clustering procedures, and as such, may have overlooked differences in their combined associations with symptoms of emotional problems. Second, the current study evaluates established measures associated with problematic identity formation (depression and anxiety) alongside additional, measures of mental health (self-worth and emotion dysregulation) and a novel measure that is indicative of problematic identity formation like that found in personality disorders, identity disturbance. Lastly, previous studies utilizing the three-factor model of identity and measures of identity disturbance have been conducted in European and American populations, respectively. Considering that Australian youth employment has been less impacted by recent global financial events compared to most European countries (excluding Germany), and that

Australian young people finish compulsory education at age 16 or 17 (Junankar 2015), young Australians enter the labor market earlier, as well as have more potential pathways available to them for employment or study. These factors may provide a less structured context in which educational and vocational commitments are made compared to that experienced by young people in other cultures, and hence, young Australians may experience unique difficulties in identity formation compared to other countries.

Future Research Directions and Limitations

The current study findings and their potential explanations suggest some future research directions. Most relevant is the need to examine concurrent domain-specific identity patterns. Such an approach was useful in the present study, as a previously under identified group of young people who may not necessarily be highly reconsidering choices, but may be more invested in interpersonal relationships to form their identity relative to academics or work, was identified as another group of youth at risk for mental health problems.

The finding that higher commitment in friendship domain combined with low commitment in the education domain is as problematic as high reconsideration of commitment provides further insight into the role of others in identity formation and in protecting against mental health problems. Similar to the current study's findings, adolescents reporting high connectedness in social relationships but report low connectedness to school in the middle years of schooling were at greater risk for health risk behaviors like drug and alcohol use by grade 12 (Bond et al. 2007). Further, school connectedness, above and beyond social connection, was found to be protective against symptoms of depression and anxiety by the end of high school (Bond et al. 2007). Taken together, this might suggest that forming a committed identity grounded in one's interpersonal relationships, without firmer self-driven intrapersonal development, may be an indicator of problematic mental health or unhealthy preoccupation with the best friendship. Intervention efforts to assist young people in navigating the adolescent period with fewer problems with risk behavior and symptoms of mental health problems could integrate these findings by providing young people a variety of opportunities to explore interests that reflect personal values, goals, and desires, as well as guidance about how to apply these interests in future endeavours.

Future research could shed further light on how identity development contributes or prevents further mental health problems for young people. For example, the current study evaluates the construct of identity disturbance, a key criterion for Borderline Personality Disorder and is likely transdiagnostic to other personality disorders (APA 2013). Longitudinal data that evaluates normative processes of

commitment, in-depth exploration, and reconsideration of commitment alongside identity disturbance, as well as capacities (like emotion regulation or problem solving) that are known to be successfully improved in interventions, could shed light on how to prevent young people from continuing on a path towards symptoms of disorder.

A few important limitations of the current study warrant mention. As this data is cross-sectional, it may be the case that mental health symptoms—like low mood, emotional dysregulation, or low self-worth – might increase the difficulties an adolescent has with making identity commitments in either domain. As theorized by Bender and Skodol (2007), identity formation difficulties (found especially in borderline personality disorder) might be evidence of an adolescent's difficulty maintaining and integrating separate and distinct nonthreatening internal images of the self and others. Over-identification within the friendship domain might indicate risk of more severe personality pathology later, or such over-identification (or preoccupation) could occur following difficulties with symptoms. Longitudinal investigations would be useful in understanding the true meaningfulness of the patterns of the clusters found in the current study, as longer term outcomes may differ. For example, committed reconsiders might continue to have difficulties with mental health symptoms, while friend identifiers continue to develop commitments in the education domain and look more similar to their committed peers over time.

Conclusion

The significance of identity formation in the development of psychopathology has increasingly been the interested of developmental researchers and clinicians (Josselson and Flum 2015, Klimstra and Denissen 2017). Previous findings suggest that the presence of commitment and the absence of exploration and reconsideration, collapsing across domains, is better for mental health (Crocetti and Meeus 2015). Adding to the complexity, such processes can differ across domains (Albarelo et al. 2017; Crocetti et al. 2012b). The current study provides further support that adolescents commit, explore, and reconsider their identities differently across the educational and interpersonal domains and discernible patterns in these differences are meaningful in that they are associated with better, or worse, mental health, and in particular the novel measure of identity disturbance. Further, the study provides a first glimpse of these measures of identity formation and disturbance in a sample of Australian youth. These findings suggest that blanket approaches of understanding commitment or reconsideration of commitment may not be entirely accurate – as not all commitment is beneficial, and not all reconsideration of

commitment is as problematic as previously thought. The results of the current study also suggest that evaluating domains separately is useful, especially when research questions aim to identify problematic or protective pathways.

Authors' Contributions S.M.C. conceived of the study, participated in its design and coordination, was involved in the acquisition of data, performed statistical analysis, interpreted results, and drafted the manuscript; M.Z.G. conceived of the study, participated in its design and coordination, assisted with analysis and interpretation of results, and helped to draft the manuscript. A.D. made substantial contributions to the conception of the study and interpretation of results, and was involved in drafting and revising the manuscript. All authors read and approved the final manuscript.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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