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## **Exploring Barriers to and Drivers of Participatory Arts Engagement in Early Adolescence**

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### **Author note**

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**Abstract**

Participatory arts engagement is argued to afford an array of prosocial and positive wellbeing outcomes across the lifespan. However, young people may face barriers to engagement that hinder access to the arts' putative benefits. We explored the barriers to participatory arts engagement that early adolescents face and the extent to which wellbeing levels are associated with the perception of such barriers. We also explored associations between adolescents' individual differences in personality, curiosity and wellbeing and their relative interest in different types of art activities. Participants completed questionnaires that measured their perceived barriers to engagement and their individual differences in personality, curiosity, and well-being. They also completed items measuring their interest in taking up a list of arts opportunities that varied in terms of affordance for solitary creativity, performing to an audience, or working with others in a group. Results showed a key barrier to arts engagement to be related to motivation. Specifically, participants reported relatively low levels of desire and drive to engage. Critically, however, we found a relationship between participants' interest in taking up particular arts opportunities and their patterns of personality and curiosity. Finally, our data revealed low wellbeing to be associated with reduced interest in arts activities involving performing to an audience and working with others. Taken together, our results speak to the potential relevance - if art engagement's putative benefits are to be exploited - of tailoring arts opportunities to young people's personalities and interests, and of facilitating entry points for young people with poorer wellbeing.

*Keywords: Barriers, Adolescent arts engagement, Wellbeing, Curiosity, Personality*

Participatory arts engagement - engaging in arts activities in an active rather than a passive or receptive way - is held to afford myriad benefits to young people (Bungay & Vella-Burrows, 2013; Ennis & Tonkin, 2018; Karkou & Glasman, 2004; Stickley et al., 2012; Zarobe & Bungay, 2017). Research findings suggest that the arts help young people to, amongst others, develop their social skills, confidence, identity and creative thinking, as well as improve their emotional and physical health, and enhance their engagement in wider learning (Anderson et al., 2020; Boer & Abubakar, 2014; Burkhardt & Brennan, 2012; Ennis & Tonkin, 2018; Goldstein, 2011; Hsiao, 2010; Karkou & Glasman, 2004; Mannay et al., 2021; Moneta & Rousseau, 2008; Rapp-Paglicci et al., 2011; Rizzi et al., 2020; Robson & Rowe, 2012; Rogers et al., 2014; Wolf & Baker, 2012; Zarobe & Bungay, 2017). However, although research into the factors associated with adult arts engagement has boomed over the last two decades, similar research with respect to adolescent arts engagement is arguably still in its infancy (Daykin et al., 2008).

### **Perceived barriers to arts engagement.**

A number of sources express concern that the level of participatory arts engagement in young people is low and ever waning (Tait et al., 2019). For example, the UK Department of Culture Media and Sport (DCMS) attests that a fifth of young people fail to engage with the arts outside of reading and writing (Taking Part Survey, 2021). Often cited as a key reason for the low rates of adolescent arts engagement is the claim that educational policy tends to undervalue the importance of arts curricula (Clarke & Basilio, 2018). For instance, the British Phonological Institute (BPI) reports that UK state schools saw a 21% decrease in music provision between 2016 and 2021, and that even in cases of high student demand, only a small proportion of schools offered instruction (*BPI Calls on Government to Tackle Growing Inequality in Access to Music in State Schools, 2020*).

A real possibility, however, is that many young people choose not to engage with participatory arts activities for reasons other than the availability of opportunities to do so. Barriers to arts engagement may be defined as those factors, whether real or perceived, that preclude participation in arts activities. Due to the wide range of changes that can be anticipated over the life-span (e.g., with respect to contexts, opportunities, resources and decision-making powers), it is relevant to ask what types of barriers may be most acutely experienced in different age-groups. Early research into adults (Kay et al., 2008) suggested that barriers to arts engagement can be grouped broadly into the *External/ situational* (e.g., cost and logistics of engaging), the *Product-specific* (related to perceived quality of offerings) and the *Personal* (related to issues around interest, identity and peer group factors), while in a study of older adults in Canada, barriers to participation ranged from cost of participation, to both a lack of interest in available programs, and a reluctance to participate alone (Dupuis, 2022). There is still only little research into the specific barriers to arts engagement that are experienced by young people. However previous characterisation of these barriers as *Functional* (pertaining to a lack of opportunity), *Practical* (pertaining to the inability to take advantage of opportunities) and *Attitudinal* (pertaining to the lack of a sense of belonging or identification with the arts), would seem to suggest fairly similar barriers to those seen in adults (Evans, 2016; Kawashima, 2000; Tait et al., 2019).

Interestingly, recent research using a prominent behavioural change model (the Capability, Opportunity, and Motivation Model of Behaviour; Michie et al., 2011) suggests that the most intensely felt barriers to adult arts engagement may be related to the motivation to actually engage (Fancourt et al., 2020; Fancourt & Mak, 2020). This finding in adults begs the question of whether motivational barriers are also particularly prominent in young people. Supporting the idea that it might be, findings from an interview study suggest that young people who do regularly partake in the arts may do so for motivational reasons, namely

“feeling a real buzz” (Harland & Kinder, 1995). However, while the idea that, as for adults, many young people may lack the motivation to engage in the arts is plausible (Fancourt et al., 2020), this possibility remains to be studied in a systematic way.

### **The potential role of personality in driving arts engagement**

If barriers can be considered those factors that negatively influence levels of engagement, drivers may be considered factors that, by contrast, encourage a tendency to engage. There is evidence that, as for adults (Kay et al., 2008), young people who engage in the arts do so, in part, to help forge a sense of self-identity and to express themselves (Harland & Kinder, 1995). Thus, given the links between identity formation and personality development in adolescents (Klimstra, 2013; Lounsbury et al., 2007) an interesting question is whether young people’s interest in arts - in general, but also with respect to specific forms of arts opportunities – may also be associated with their individual differences in patterns of thinking, feeling and behaving (that is, with their individual differences in personality).

Speaking to such an idea, a significant body of work demonstrates that adults display differing levels of dispositions to engage in arts opportunities as a function of their personality traits. In adults, interest in engaging in arts activities, hobbies and occupations, in general, has often been associated with high openness to experience, but also, in some studies, with high levels of neuroticism and low levels of conscientiousness (Chamorro-Premuzic & Furnham, 2004; Furnham, 2021; McManus & Furnham, 2006). Further, suggesting that different personality traits may explain differing levels of interest in different types of arts activities or domains, individuals high in extroversion have been shown to be particularly interested in popular music (genres such as pop, rock, dance and hip hop as compared to classical music), but not so interested in the literary arts (McManus & Furnham, 2006).

In young people, individual differences in openness to experience has also been linked to arts engagement (Martin et al., 2012; Hong et al., 2014). However, it remains unclear whether other personality traits are also able to explain the patterns of arts engagement and interest they show. It is feasible that a high level of extroversion, for example, promotes interest in arts activities that afford opportunities to perform to or interact with others, while conversely, due to neuroticism's links to anxiety and depression (e.g., Jylhä, & Isometsä, 2006), individuals high in this trait, all else being equal, may be more drawn to art opportunities that are solitary (i.e., that do not require interacting with others). Critically, as personality traits in adolescence have been shown to be reliably captured by Big 5 personality models (Digman, 1990; John & Srivastava, 1999), such hypotheses about how key personality traits are associated with engagement in young people are possible to test.

Critically, insights into the extent to which individual differences in personality traits are linked to patterns of adolescents' interests in the arts can be leveraged to improve how arts programs are designed and provided. Already, the importance of tailoring arts programs has been researched extensively on the level of the school. There, systematic efforts have been taken to determine the kind of programs that may be maximally beneficial for all students (McFerran & Crooke, 2014; McFerran et al., 2022). However, while arts therapy programmes are generally customised to suit the individual or special populations in question (e.g., Gatta et al., 2014) and while it has been shown that tailored arts engagement activities are more effective than generic ones (Shryock & Meeks, 2020), there has been little attempt to tailor the advertisement -and provision - of arts opportunities according to adolescents' individual differences. Empirical evidence that adolescents' personality traits and their interest in different arts opportunities show systematic relationships, would provide much needed encouragement for adolescent arts provision to be more carefully curated.

### **The potential role of curiosity in driving engagement**

Also relevant to explore is what role, if any, individual differences in trait curiosity may play in driving interest in arts engagement; both in general and with respect to specific arts opportunities. Highly related to the personality trait, openness to experience, trait curiosity has been defined as the extent to which an individual adopts a general interest in and openness to new ideas, and chooses to solve intellectual problems and engage with new activities (Litman, 2012; Mussel, 2010; Silvia & Christiansen, 2020; Silvia & Kashdan, 2009; Wu & Wu, 2020). However, to date, little is known about whether different aspects of curiosity experience and expression, that can be seen at the trait level, are linked to the different patterns of interest that adolescents show in arts opportunities.

In adults, the different theories regarding what trait curiosity entails and how it manifests have resulted in a diverse range of scales and tools with which to measure it (Collins et al., 2004; Litman & Jimerson, 2004; Litman & Spielberger, 2003; Silvia & Christensen, 2020; see Wagstaff et al., 2020 for a review). In one widely-used scale known as the Curiosity and Exploration Inventory-II (CEI-II; Kashdan et al. 2009), a first dimension, known as stretching, is argued to capture a tendency to explore new information or experiences, and maintain concentration and attention toward an interest or goal. In turn, the second dimension, embracing, is held to relate to a willingness to engage with the unpleasant aspects of experiencing novelty, uncertainty and unpredictability. More recently, creators of the same scale emphasize the need to measure yet more aspects of the experience and expression of curiosity - from interest in others to a desire for thrilling experiences - all in a single tool (Kashdan et al., 2018; 2020).

Specifically, in the Five-Dimensional Curiosity Revised scale (5DC-R) developed by Kashdan and colleagues (2020), while the joyous exploration dimension is held to capture positive emotions that come from new experiences and information, the deprivation sensitivity dimension is held to capture any distress induced by a perceived gap in knowledge



(Litman & Jimerson, 2004; Loewenstein, 1994). In turn, the thrill-seeking dimension captures a tendency to seek out intense experiences, while two social curiosity dimensions capture the desire an individual may have for information about others, both on a covert and overt level. Lastly, the authors describe the stress tolerance dimension as capturing an individual's ability and willingness to deal with the stress and tension that comes from novelty and uncertainty. Interestingly, the notion of the importance of a stress tolerance factor resonates with previous findings of a negative relationship between levels of curiosity and anxiety (Naylor, 1981).

Over the last decades, developmental considerations can be seen reflected in how curiosity has been measured in non-adults. For example, due to children's limited ability to self-assess on abstract states, curiosity questionnaires for this age group have tended to involve either judgments by teachers, or the measurement of curiosity behaviours such as the duration of time spent engaging with new objects (Chambers & Johnston, 2002; Endsley et al., 1979; Harty & Beal, 1984; Jirout & Klahr, 2012; Maw & Maw, 1965; McReynolds et al., 1996). More recently, curiosity in adolescents has also been measured with tools like The Values in Action Inventory for Youth (Park & Peterson, 2006), which includes a subscale for capturing curiosity, amongst several other character strengths.

However, the idea that, young people, like adults (Kashdan et al., 2020), may manifest curiosity in different ways (Kreitler et al., 1975), implies that such unidimensional measures of adolescent curiosity may be lacking in explanatory power. Evidence that certain multidimensional tests of adult curiosity (e.g., the CEI-II and the 5DC-R) have satisfactory psychometric properties in adolescents (Clark et al., 2019; Jovanovic & Brdaric, 2012; Karwowski, 2012; Kwok et al., 2022; Lemberger-Truelove et al., 2021; Weible & Zimmerman, 2016) may therefore be considered welcome news, promising, as such tests do, the possibility of insights into how different dimensions (aspects) of adolescent curiosity are linked to (or may even influence) patterns of interest in the arts.

Indeed, since many of the 5DC-R's (Kashdan et al., 2020) dimensions map onto some of the key affordances of arts activities, this scale specifically, may be considered useful in testing the hypothesis that the different ways in which curiosity is experienced and expressed are linked to patterns of interest in the arts. For instance, stress tolerance and thrill seeking may be expected to predict greater interest in those participatory arts activities that are linked with performance or putting ones' self on show. In turn, while deprivation sensitivity may be expected to correlate with interest in self-driven or self-motivated solitary arts engagement opportunities, in contrast, social curiosity may be expected to predict relatively high interest in sociable arts activities, such as playing in a band / orchestra or performing in the ensemble cast of a play (Gnecco et al., 2014; Harper, 2009). Lastly yet importantly, the dimension joyous exploration, which describes an un-mediated interest in new experiences may be expected to correlate with a general willingness to engage in all types of arts opportunities. Critically, identification of such relationships in an adolescent population would demonstrate the relevance of arts providers working to curate arts engagement opportunities to the different trait curiosity profiles that young people can show.

#### **Associations between mental wellbeing and perceived barriers to engagement.**

Finally, it is relevant to consider whether mental wellbeing is associated with either the barriers to arts engagements young people report experiencing, or the specific patterns of interests they may show in different arts opportunities. Indeed, while a large number of studies have shown that the arts have the potential to enhance wellbeing (e.g., Fancourt & Finn, 2020), previous findings in adults also clearly illustrate poor mental health to be associated with the experience of barriers to arts engagement, especially with regard to the motivation to engage (Fancourt et al., 2020; Fancourt & Mak, 2020).

Similarly, it is plausible to expect that some forms of arts engagement will be less attractive to those with poor wellbeing simply due to the degree of interaction with others that

such opportunities entail. Mental wellbeing has been shown to be strongly associated with self-esteem (e.g., Karatzias et al., 2006) raising the possibility that arts opportunities that involve performance or group collaboration may be particularly daunting and unattractive to those with poor wellbeing. However, despite the plausibility of such hypotheses, the potential associations between adolescent mental wellbeing and perceived barriers and specific patterns of interest in the arts, remains to be explored.

### **The current study**

Taken together, the current study explores the barriers to participatory arts engagement experienced by early adolescents (11- to 14-year-olds), and asks whether there are any stable personality or curiosity traits may be capitalized upon in order to overcome such barriers. It also seeks to determine whether and how mental wellbeing may be linked to either perceived barriers to engagement or the decision to engage in specific types of arts opportunities.

As a first step, we asked participants about the arts activities they currently engaged in before asking about the barriers they felt with regard to arts engagement in general. For comparability with adults (Fancourt & Mak, 2020; Fancourt et al., 2020), and as it has previously been used to study adolescents in other domains (Beck et al., 2019; McDermott et al., 2022; Murtagh et al., 2018), the COM-B Behavioural Change Framework (Michie et al., 2011) was used to measure these barriers.

Next, we presented participants with a newly created Interest in Arts Opportunities scale which allowed the examination of respondents' interest in three types of arts opportunities that had been matched for art domain; creative arts opportunities carried out alone (e.g., composing original pieces of music or writing poetry alone), performance-rich arts opportunities (e.g., taking the lead role in a play, or performing stand-up comedy) and, thirdly, arts opportunities involving group collaboration (e.g., working with others to create

art exhibits, working as part of a TV or film crew). Finally individual differences in personality, curiosity and wellbeing were measured using versions of The Ten Item Personality Inventory (Gosling et al., 2003; Müllensiefen et al., 2015), the Five-Dimensional Curiosity Scale Revised (5DC-R; Kashdan et al., 2020), and the Short Warwick Edinburgh Mental Wellbeing Scale (SWEMWBS; Stewart-Brown et al., 2009) respectively.

Our first set of analyses focused on assessing prevalence of reported barriers to engagement and examining how these were linked to respondents' wellbeing levels. In brief, we predicted that, as for adults (Fancourt & Mak, 2020; Fancourt et al., 2020), motivation would be a particularly high barrier to engagement, and that low mental well-being would be associated with a greater number of barriers (especially motivational) being reported.

Our next set of analyses examined whether different personality, curiosity and wellbeing variables would be associated with interest in different types of art opportunities. With regard to personality, we predicted that while openness to experience would be associated with interest in all types of opportunities, extroversion may be associated with a particular interest in both performance and group activities, and neuroticism with a particular interest in solitary creative opportunities. Similarly, we predicted that while those high in joyous exploration would show an interest in all types of activities; those high in stress tolerance and or thrill seeking would show the greatest interest in performance activities, those high in social curiosity would show greatest interest in group activities, and those high in deprivation sensitivity may be drawn to self-driven (solitary creative) opportunities. Finally, we predicted that while poor mental wellbeing would be associated with reduced interest in all types of arts activities, this reduction may be particularly striking for those opportunities involving performance or interaction with others (performance and group activities).

## Materials and methods

### Participants

The present study was approved by the Ethics Committee of the University Department. Participants were recruited with the support of Curious Minds, a cultural education provider, based in the North of England.

A sample of 302 participants (age range = 11 to 14 years old;  $M = 12.4$ ;  $SD = 0.86$ ), was recruited from two academy secondary schools in the north of England. Academy schools are state-funded schools that are nevertheless independent from local authorities. They have more autonomy than other state schools with regards to curriculums, term dates, and school hours, amongst others, but are subject to the same inspections. The Office for Standards in Education (Ofsted) is responsible for carrying out said inspections. The two schools from which participants were recruited had an Ofsted rating of 2 on a scale of 1 to 4, where 1 is “Outstanding”, 2 is “Good”, 3 is “Requires improvement” and 4 is “Inadequate”.

The gender distribution for the sample was approximately 54% female, 40 % male and 6% non-binary or preferring not to say. The majority of participants were White British (83.7%) (followed by Asian (5.6%), mixed ethnicity (5%), and Black British (3.3%)) and lived in a town (88.1%). When asked about the highest level of education of their parents, 58.9% and 61.3% of participants, referring to their first and second parent respectively, either provided no answer or indicated “Do not know”, “Prefer not to say” or “Not relevant to me”. Of those participants who gave an answer, 47.6% and 40.17% (again, referring to their first and second parent respectively) indicated the highest level of education of their parents to be post-school qualification or higher (e.g., undergraduate or post graduate university degree), 38.7% and 44.4% reported the highest level of education to be schooling until 18, while 13.7% and 15.4% reported that their parents had no formal qualifications.

As participants were under the age of 18, letters seeking permission to invite participants to participate were distributed to caregivers (parents and guardians) via participating schools. Subsequently, the young people that we invited to participate, (based on caregiver permission being given) were given the opportunity to decline to do so. All participants were entered into a prize draw to win one of 10 £20 Amazon gift vouchers.

### **Materials**

The present study employed a questionnaire design that was implemented online. The survey was compiled using Qualtrics survey software (Qualtrics, Provo, UT) and optimized for mobile (phone, iPad) as well as PC (desktop computer) device use. Five questionnaires, as described below, were presented.

#### ***Arts participation questionnaire***

Levels of ongoing engagement in arts activities were evaluated by presenting participants with the question: “How often do you engage in the following types of arts activities?” (e.g., Davies et al., 2012; Fancourt et al., 2020), underneath which were listed “Performing arts (e.g., singing, dancing, playing an instrument, performing or rehearsing for a play/drama/opera/musical theatre)”; “Visual arts (e.g., painting, drawing, printmaking, or photography)”; “Design and crafts (e.g., sewing, crocheting, carving, furniture making, baking, or cooking)”; “Literature related activities (e.g., reading novels/poetry/stories, creative writing)” and “Online, digital, and electronic arts (e.g., creating digital artwork or animations, making videos)”. For each group of arts activities, participants could choose from the option, “more than once a week”, “once a week”, “more than once a month”, “once a month” and “rarely” to indicate their level of engagement. Levels of each individual’s ongoing engagement in arts activities were then estimated by averaging the frequency with which they reported engaging in each of the 5 categories (where “more than once a week” = 5, “once a week” = 4, “more than once a month” = 3, “once a month” = 2 and “rarely” = 1).

### ***Interest in Arts Opportunities questionnaire***

The 18-item Interest in Arts Opportunities questionnaire was newly generated for the present study due to the absence of any appropriate questionnaires. The purpose of the questionnaire was to ascertain the degree to which participants demonstrate more or less interest in categories of arts opportunities that differ in terms of their affordances for being creative alone, for participating in arts in a group or performing to an audience.

Specifically, for each of six arts domains (music, theatre, literature, visual arts, crafts, and entertainment), three items were created to measure interest in categories we named solitary creative, performance and group arts opportunities. For example, in the literature domain: “I think I would enjoy writing poetry” was the item related to solitary creativity while “I think I would enjoy public speaking or reading to an audience” and “I think I would enjoy collaborative writing of biographies or novels” corresponded to performance and group opportunities respectively.

While, for variety, a few items alluded to professions (e.g., “I think I would enjoy working as part of a TV or film crew” or “I think I would enjoy working in an architecture or building team”, the stem for each item, “I think I would enjoy...” accommodated for the possibility that several participants would have had no prior experience of certain arts opportunities. In any case, it is important to note that all activities were selected with feasibility in mind, and such that they would be familiar, at least in concept, to participants in the age group.

Participants were required to provide a binary response to each item (Yes / No) to allow the scale to be administered expediently. Interest in the each of the arts opportunity categories (solitary creative; performance; group activities) was operationalized as the number of times each of the six items in each of the three categories was chosen (thus a count

variable with possible values 0 to 6). A complete list of the items can be found in Supplementary Table 1.

### ***The COM-B Model questionnaire***

The COM-B Model of Behaviour (Michie et al., 2011) represents capability, opportunity and motivation as three input factors that ultimately influence a single output, behaviour. As the COM-B model of behaviour has previously been used to inform questions and interview schedules in research on adolescents (Beck et al., 2019; McDermott et al., 2022; Murtagh et al., 2018), it was deemed appropriate for use in the current study.

Critically, to allow broad comparisons with findings in adults, the present study adapted a version of the COM-B questionnaire that had previously been used to study arts engagement barriers in adults (Fancourt & Mak, 2020). In that test, automatic motivation arts engagement barriers captured automatic processes with respect to desires, impulses and drives (e.g., "... would need to enjoy engaging in artistic activities") while reflective motivation barriers emerged from evaluating one's self, goals and past experiences with the arts (e.g., "... would need to believe that it would be good for me"). Physical opportunities were related to access and available resources (e.g., "... would need to have more time to do it") while social opportunities were related to feelings of belonging and support (e.g., "... would need to know more people who do the activity"). Finally, while psychological capabilities related to perception of psychological readiness to engage in the arts (e.g., "... would need to feel more mentally capable"), physical capabilities related to the perception of one's own physical ability (e.g., "... would need to overcome physical limitations").

All items from that test, which comprised three items for each of the six barrier types (automatic and reflective motivations, social and physical opportunities and psychological and physical capabilities) were first carefully evaluated to ensure they were suitable for an adolescent audience. Subsequently, certain items underwent age-appropriate alterations (for



example, replacing workplace-related words, such as “colleague” and “work”, with the more age-appropriate “classmate” and “school”) or synonymic simplifications (e.g., replacing “employable” with “help me get a job in the future” and “breadth of activities” with “sorts of hobbies”) as relevant. Further, yet other items were altered to reflect the reduced decision-making powers and lack of income that young people have. For example, the item “...I would need to be able to afford the resources” ... was replaced with “...I/my family would need to be able to afford the resources”.

Alterations were agreed by the three authors, which included a researcher with extensive experience working with young people. As in a previous use of the COM-B scale for measuring arts engagement barriers in adults (Fancourt & Mak, 2020), participants were required to report on their agreement with each of the 18 items using binary responses (True / False). Levels of experienced barriers could accordingly be operationalized as the number of times items from each of the six possible barriers were chosen (thus a count variable with possible values 0 to 3). The comprehensive COM-B scale used here, with all changes from that used in adults (Fancourt & Mak, 2020) detailed, can be seen in Supplementary Tables 2a and 2b.

### ***The Five-Dimensional Curiosity Scale Revised (5DCR)***

Curiosity was assessed using a version of The Five-Dimensional Curiosity Scale Revised, 5DC-R (Kashdan et al., 2020) which comprises four items for each of six curiosity subscales: joyous exploration, deprivation sensitivity, stress tolerance, thrill-seeking, and overt and covert social curiosity.

Once again, all items were carefully evaluated to ensure they were appropriate for use in early adolescents, and where this was deemed not to be the case, items underwent age-appropriate alterations and/or synonymic simplification. Specifically, while items in the Overt and Covert social curiosity dimension were considered appropriate as they were, other

items were amended to use synonymic simplification (e.g., “deeply” instead of “in depth”, and “I don’t give up” instead of “I work relentlessly”). Further, as young people are rarely subject to the degree of pressure adults face and as they lack some of the freedoms that adults have, “I cannot handle stress” was changed to “I prefer to avoid stress”, while “explore new places”, and “entering uncertain situations” was altered to “do new things”, and “doing something I haven’t done before” respectively. Finally, to make items even more accessible to young people, examples were given where deemed necessary (e.g., “I like to do things that are a little scary” was amended to “I like to do things that are a little scary (like cycling very fast)”. All alterations were agreed by the authors, which includes a researcher who is experienced in preparing age-appropriate survey items.

As recommended for the published test, participants were asked to rate their agreement with each item on a 5-point Likert scale, ranging from *Strongly Disagree (1)* to *Strongly Agree (5)*. The 5DCR has shown reliability in an adolescent cohort in previous work (Lemberger-Truelove et al., 2021). Here, as well it showed particularly high/good internal consistency with values above 0.8 for all 6 dimensions (specifically, Cronbach’s alpha of 0.84, 0.84, 0.85, 0.81, 0.86, and 0.84 for joyous exploration, deprivation sensitivity, stress tolerance, thrill seeking, overt social curiosity and covert social curiosity respectively). The comprehensive scale used in this study (with all changes detailed from the original detailed) can be seen in Supplementary Tables 3a and b.

### ***The Ten item Personality Inventory (TIPI)***

Personality was assessed using a brief psychometric measure of the Big 5 personality dimensions (Gosling et al., 2003) in a form that has been shown to be suitable for adolescent participants (Müllensiefen et al, 2015). Specifically, while the original TIPI scale includes two adjectives in each of 10 items (2 items per personality subscale), the employed version adds a further two adjectives to each item, making a total of four adjectives per item

(Müllensiefen et al, 2015). Participants were asked to rate their agreement with each item (e.g., “I see myself as extraverted, enthusiastic, sociable, lively”) on a 7-point Likert scale, ranging from *Strongly Disagree (1)* to *Strongly Agree (7)*.

The TIPI has previously been shown to have satisfactory psychometric properties in adolescents (Li, 2013; Li et al., 2017) and also showed satisfactory reliability in the current study. Indeed, the Cronbach’s alpha values of 0.73, 0.66, 0.70, 0.79 and 0.70 obtained for extraversion, agreeableness, conscientiousness, neuroticism and openness to experience respectively may all be considered adequate for a short instrument with only two items in each subscale.

### ***The Short Warwick Edinburgh mental wellbeing scale (SWEMWBS).***

The SWEMWBS (Stewart-Brown et al., 2009) is a short version (7 items) of the 14-item Warwick-Edinburgh Mental Well-Being Scale (WEMWBS), both of which were developed to measure mental wellbeing. Participant were asked to rate their agreement with SWEMWBS items (such as “In the last week, I have been feeling optimistic about the future”), on a 5-point Likert scale using the options “None of the time”, “Rarely”, “Some of the time”, “Often” and “All of the time”. Raw scores on the SWEMWBS were converted into metric scores using the SWEMWBS conversion table as recommended<sup>1</sup>. The SWEMWBS variable showed high reliability in the current sample with a Cronbach’s alpha of 0.83.

### **Procedure**

Participants filled out the full battery of questionnaires in a fixed order, via a single Qualtrics link. Specifically, following initial questions pertaining to demographics, participants completed the Arts participation survey, the Interest in Arts Opportunities questionnaire, the adolescent-appropriate versions of the COM-B questionnaire (Fancourt &

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<sup>1</sup> Short Warwick Edinburgh Mental Well-Being Scale (SWEMWBS) © NHS Health Scotland, University of Warwick and University of Edinburgh, 2008, all rights reserved

Mak, 2020), the Five-Dimensional Curiosity Scale Revised (5DC-R) (Kashdan et al., 2020) and the Ten Item Personality Inventory (TIPI) (Gosling et al., 2003; Müllensiefen et al., 2015); and finally the Short Warwick Edinburgh Mental Wellbeing scale (SWEMWBS; Stewart-Brown et al., 2009).

### **Analysis**

All analyses were performed using R packages (R core team) in the R Studio environment (RStudio, 2020). A first stage of analyses examined whether there was any difference in the extent to which the six different types of barriers (psychological capabilities, physical capabilities, social opportunities, physical opportunities, automatic motivations and reflective motivations) were reported and whether the number of barriers reported for each type was linked to wellbeing level of respondents. Here, as our dependent variable was a count variable (and therefore followed a Poisson distribution even if the large sample sizes meant that variables began to resemble a normal distribution), we estimated Poisson Generalized Linear Mixed Models (using the *glmer* function in R) with number of barriers as dependent variable (possible values 0 to 3), with barrier type (psychological capabilities, physical capabilities, social opportunities, physical opportunities, automatic motivations and reflective motivations), and wellbeing level and as fixed effects, and with participant as random effect. Further, an additional model with ongoing arts participation level as an additional fixed effect was carried out to explore whether participation level - either on its own or in interaction with wellbeing levels - would be associated with the number of barriers experienced.

In a next stage of the analyses, we then examined associations between reported interest in the different arts opportunity types (solitary creativity, performance, group activities) and individual differences in i) Big 5 personality TIPI variables ii) 5DCR curiosity variables and iii) the SWEMBWS wellbeing variable. Here we estimated Poisson GLMMs

with number of activities of interest as dependent variable (count variable with possible values 0 to 6), the dimensions of the relevant scale (e.g., extroversion, openness, conscientiousness, agreeableness, neuroticism for the TIPI) as fixed effects that were allowed to interact with arts opportunities type (three levels: solitary creativity, performance, group activities) and participant as random effect.

## Results

### **Descriptive statistics and relationships between predictors**

Table 1 provides an overview of the patterns of barriers reported by participants while Table 2 shows descriptive statistics of, and correlations between, the different individual difference variables used as predictor variables (model fixed effects). Distributions of all predictor variables can be seen in Supplementary Figure 1.

In brief, the highest correlations observed between TIPI and 5DCR dimensions were between joyous exploration and openness to experience ( $r = 0.36$ ), joyous exploration and conscientiousness ( $r = 0.34$ ) and between stress tolerance and neuroticism ( $r = -0.32$ ). Further, we observed that wellbeing was most strongly associated with the TIPI's neuroticism ( $r = -0.39$ ) and openness to experience ( $r = 0.33$ ), as well as the 5DCR's joyous exploration ( $r = 0.32$ ).

Here it is worthy of note that while (in the interest of keeping the survey a reasonable length) we were not able to include extra measures that would allow for thorough validity testing of our altered measures and constructs, the above observed patterns of correlations nevertheless suggest satisfactory validity.

**Insert Table 1 and 2 about here.**

### **Barriers to engagement and associations with wellbeing.**

Our first set of analyses tested the hypotheses that motivation may be a prominent barrier to adolescent arts engagement and that this barrier type may be particularly associated

with mental wellbeing. A Poisson Generalized Linear Mixed Model (GLMM) showed that while there was a significant main effect of barrier type ( $\chi^2(5) = 23.60, p < 0.001$ ) on the number of barriers reported, and that while those with poor wellbeing reported a numerically greater number of barriers, neither the effect of wellbeing level ( $\chi^2(1) = 0.03, p = 0.86$ ) or interaction between wellbeing level and barrier type ( $\chi^2(5) = 3.52, p = 0.62$ ) were significant. Post hoc tests exploring the main effect of barrier type revealed that the automatic motivation and psychological capabilities barrier subtypes were more frequently reported than all other types of barriers (all  $p$  values  $< 0.05$ ).

We further explored whether participation level either on its own or in interaction with wellbeing levels was associated with the number of barriers experienced. An additional Poisson GLMM showed an effect of participation level ( $\chi^2(1) = 10.48, p = 0.001$ ) whereby more barriers were reported at higher levels of engagement. However, participation level did not significantly interact with barrier type or wellbeing levels to explain number of barriers reported.

### **Accounting for interest in different arts opportunity types using personality traits**

The next set of analyses tested the hypotheses that interest in arts opportunities, both in general and with respect to specific activity types, would vary as a function of personality dimensions. Accordingly, a Poisson GLMM was run with number of activities of interest as dependent variable, and with the TIPI dimensions as five fixed effects, each of which were allowed to interact with the sixth fixed effect, activity type (solitary creative, performance, group activity). Participant was once more taken as a random effect.

This analysis showed openness to experience ( $\chi^2(1) = 14.23, p < 0.001$ ) and activity type ( $\chi^2(2) = 27.28, p < 0.001$ ), as well as the interaction between activity type and extroversion ( $\chi^2(2) = 5.998, p = 0.05$ ) to be significant predictors. Openness to experience was associated with high levels of interest in arts opportunities in general ( $B = 0.13, SE = 0.05$ ,

$z = 2.716$ ,  $p = 0.007$ ) while follow up models examining the activity type effect showed that general interest in performance activities was much less than interest in both solitary creative ( $B = 0.28$ ,  $SE = 0.06$ ,  $z = 4.8$ ,  $p < .0001$ ) and group ( $B = 0.29$ ,  $SE = 0.06$ ,  $z = 4.9$ ,  $p < .0001$ ) opportunities, which in turn did not differ from each other ( $B = 0.005$ ,  $SE = 0.05$ ,  $z = 0.095$ ,  $p = 0.995$ ),

Further follow up models examining associations with extroversion separately for each activity type, showed that while greater extroversion was associated with greater interest in performance opportunities ( $B = 0.11$ ,  $SE = 0.03$ ,  $z = 3.31$ ,  $p < 0.001$ ), it was not associated with interest in either solitary creative ( $B = -0.026$ ,  $SE = 0.03$ ,  $z = -0.96$ ,  $p = 0.34$ ) or group activities ( $B = 0.031$ ,  $SE = 0.028$ ,  $z = 1.12$ ,  $p = 0.27$ ).

### **Accounting for interest in different arts opportunity types using curiosity traits**

We then tested the hypotheses that interest in arts opportunity both in general, and with respect to specific activity types, would vary as a function of trait curiosity.

Accordingly, a Poisson GLMM was run with number of activities of interest as the dependent variable, and with the 5DCR dimensions as six fixed effects, each of which were allowed to interact with the final fixed effect, activity type. Participant was taken as a random effect.

In addition to activity type ( $\chi^2(2) = 28.6$ ,  $p < 0.001$ ), both joyous exploration and ( $\chi^2(1) = 9.67$ ,  $p = 0.002$ ) and interaction between activity type and stress tolerance ( $\chi^2(2) = 9.32$ ,  $p = 0.009$ ) were revealed to be significant predictors of the number of activities participants expressed interest in. Joyous exploration was associated with high levels of interest in arts opportunities in general ( $B = 0.21$ ,  $SE = 0.07$ ,  $z = 2.84$ ,  $p = 0.005$ ) while models examining the relationship between stress tolerance and each activity type separately showed that stress tolerance was negatively associated with interest in solitary creative activities ( $B = -0.11$ ,  $SE = 0.045$ ,  $z = -2.21$ ,  $p = 0.027$ ), positively associated with interest in

performance activities ( $B = 0.123$ ,  $SE = 0.06$ ,  $z = 2.17$ ,  $p = 0.03$ ) but not significantly associated with interest in group activities ( $B = -0.05$ ,  $SE = 0.048$ ,  $z = -1.06$ ,  $p = 0.29$ ).

### **Relationship between wellbeing and different arts opportunity types.**

Finally, Poisson GLMMs with wellbeing level as fixed effects were used to examine the extent to which wellbeing level was associated with the different kinds of activities that participants expressed an interest in engaging in. Results showed that while there was no relationship between wellbeing and interest in taking part in solitary creative opportunities ( $B = -0.14$ ,  $SE = 0.01$ ,  $z = 1.69$ ,  $p = 0.1$ ), wellbeing was associated with interest in both performance ( $B = 0.04$ ,  $SE = 0.01$ ,  $z = 4.12$ ,  $p = 0.001$ ) and group ( $B = 0.03$ ,  $SE = 0.008$ ,  $z = 3.40$ ,  $p < 0.001$ ) activities.

## **Discussion**

Research suggests a role of arts and culture engagement in improving health and wellbeing across the life span (Fancourt & Finn, 2020). However, concerns about a prominent arts engagement gap in adolescents are increasingly being expressed (Bull, 2015; Tait et al., 2019). As such, the present study sought to explore the barriers to arts engagement that young people report, as well as to examine whether interest in different types of arts activities may be associated with individual differences in personality, curiosity and wellbeing.

Our results demonstrated that while automatic motivation, one of six types of barriers in the COM-B model, was, as for adults (Fancourt & Mak, 2020) the most frequently reported barrier type, there was no link between wellbeing level and the number of barriers young people reported. Our results also confirmed that individual differences in personality and curiosity are associated with the patterns of interest in arts opportunities that young people show. Specifically, while individuals high on the TIPI openness to experience and 5DCR joyous exploration dimensions tended to show a wide interest in taking part in all



types of art activities, individuals low on TIPI extroversion and 5DCR stress tolerance dimensions tended to have a particularly low interest in performance activities. Individuals low in 5DCR stress tolerance tended to show greater interest in solitary creative activities, while, last but not least, low levels of wellbeing were seen to be associated with reduced interest in performance and group activities, but not with interest in solitary creative activities.

Taken together, our findings point to motivation levels as a key barrier to overcome when considering the arts engagement gap in young people, while also showing that individual differences in personality, curiosity and wellbeing are associated in specific ways with the desire to engage.

### **Barriers to arts engagement and associations with mental wellbeing**

Previous work has characterised the barriers to arts engagement young people face as *Functional* (pertaining to a lack of opportunity), *Practical* (pertaining to the inability to take advantage of opportunities), and *Attitudinal* (pertaining to a lack of a sense of belonging or identification with the arts) (Evans, 2016; Kawashima, 2000; Tait et al., 2019). In the current study we extend that work by evaluating barriers to arts engagement using a model of behavioural change framework – the COM-B (Michie et al., 2011) that has fruitfully been used in young people in a number of other domains (e.g., with respect to healthy eating and physical activity; Beck et al., 2019; McDermott et al., 2022; Murtagh et al., 2018) as well as in adults in the context of arts engagement (e.g., Fancourt & Mak, 2020).

The results of our analysis showing automatic motivation to be the most prevalent barrier type experienced by young people, confirm that, as for adults (Fancourt & Mak, 2020), processes related to desires and impulses should be targeted whenever there is a desire to increase young people's engagement in the arts. In other words, arts providers should endeavour to ensure that young people enjoy and feel benefit (specifically “a sense of

pleasure/ satisfaction”, “better mood”; Fancourt & Mak, 2020) when they engage in arts activities so that they continue to keep doing so. In any case, that, overall, young people tended to report only relatively few barriers related to physical and social opportunities suggests that just as, if not more important, than providing a greater number of opportunities may be nurturing young people’s desire to engage in the first place (automatic motivation). Indeed, one possibility is that engaging more frequently due to increased motivation would promote young people’s feelings of being able to succeed in the activities thus reducing the number of barriers related to psychological capability (the second most common barrier type, which is characterised by feelings of lacking ability or competence) that they experience and therefore report.

Our analysis did not show a significant relationship between wellbeing and the number of barriers young people reported. This is surprising given that previous research in adult populations has associated poor mental health (depression and/or anxiety) with a higher experience of barriers to arts engagement (Fancourt et al., 2020). With regard to why adults and adolescents may differ here, one possibility is that young people find it more difficult to recognise barriers as such; thus, making it more difficult to see links with other variables, using the reports they give in this regard. A related possibility is that despite our efforts to adapt the adult version of the COM-B questionnaire to address adolescent arts engagement, this tool remained suboptimal for use in an adolescent population. In any case, as we focussed here on early adolescents (i.e., on 11- to 14-year-olds), an interesting question that remains is whether older adolescents (i.e., 15- to 18-year-olds) may show greater similarity to adults.

Lastly, it is worthy of note that while participants’ ongoing level of arts participation did not interact with wellbeing to explain the number of barriers reported, ongoing levels of arts participation were nevertheless positively associated with how many barriers were

reported. These findings (of a positive association between ongoing levels of arts participation and number of barriers reported) may seem non-intuitive at first glance.

However, one explanation is that it is only at higher levels of engagement that a young person is able to identify and recognise all the different barriers that may be stopping them from engaging further.

### **Aspects of personality and curiosity are linked to patterns of interest in arts activities**

In anticipation of finding evidence that low levels of motivation may be a prominent barrier to arts engagement in young people, we examined whether personality and curiosity profiles may nevertheless show associations with interest in participating in different types of arts opportunities. In doing so, we aimed to begin to address the question of whether profiling young people (and better tailoring or curating activities to suit their predispositions and inclinations) may allow motivational barriers to arts engagements to be overcome.

Interest in engaging in the arts in adults has previously been associated with openness to experience, neuroticism, conscientiousness and extroversion (Chamorro-Premuzic & Furnham, 2004; McManus & Furnham, 2006; Furnham, 2021). The multidimensional test of curiosity we used in the current study had also shown that different curiosity dimensions are related to the different passions and interests that adults report (Kashdan et al, 2018). There has, however, been much less examination of how personality and curiosity traits are linked to adolescent arts engagement; this despite evidence that personality traits can become stable as early as in adolescence (e.g., Caspi et al. 2005; Elkins et al., 2017; Roberts et al. 2001).

Accordingly, our results are valuable, in showing that, as for adults, certain personality and curiosity dimensions are more or less associated with young people's interest in different types of arts opportunities. Specifically, in addition to openness to experience and joyous exploration, which (in line with research in adults) were associated with interest in engaging in all arts opportunities (e.g., Furnham, 2021; Kashdan et al., 2018), we showed that

other aspects of both personality (extroversion) and curiosity (stress tolerance) showed associations with patterns of interest in both performance and solitary creativity opportunities.

Our finding that openness to experience and joyous exploration are associated with wide-ranging interest in arts engagement was expected, since these two related variables (Kashdan et al., 2018) are particularly linked to interest in engaging in new opportunities in general. Perhaps more valuable, therefore, was being able to provide evidence for the other associations that have not yet been reported in adolescents. For instance, our finding that interest in performance activities was associated with both high extroversion and stress tolerance<sup>2</sup> is useful in showing that young people high in these traits may be particularly attracted to the performing arts. Stage fright and performance anxiety have been shown to be common in amateurs and professionals alike and particularly so in introverted adults (Smith & Rickard, 2004). Our study's evidence of the additional explanatory power of the curiosity dimension, stress tolerance (operationalized as the ability to deal with the stress of uncertainty (Kashdan et al., 2018; 2020)), suggests that, along with introversion, the inability to deal with the stress of uncertainty may lead certain young people to choose not to engage with performance arts. However, evidence that low stress tolerance is associated with greater interest in solitary creative opportunities suggests that low stress tolerance individuals may nevertheless be able to benefit from such types of arts activities.

We suggest that while we were not able to provide support for some of our hypotheses (e.g., of a link between social curiosity and levels of reported interest in engaging in group activities), those hypotheses we were able to provide evidence for speak to the validity of the overarching idea: namely that young people's individual differences can at

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<sup>2</sup> Here it is worth noting that the third largest observed relationships between curiosity and personality dimensions (after that between Stress Tolerance and Neuroticism, and between Joyous exploration and Openness to experience), was that seen between Extroversion and Stress tolerance (Kashdan et al., 2018).

least partially explain their patterns of interest in engaging with certain arts opportunities. Indeed, we suggest that our results on the types of barriers young people report, and our results showing associations between personality / curiosity profiles and interest in arts opportunities, would seem to suggest the following: that appropriately matching young people with arts activities for which they may show a latent affinity (thanks to personality/curiosity profiles), may help promote the motivation that young people need to engage in the arts.

**Low wellbeing associated with low interest in performance and group activities.**

Finally, our data show that while wellbeing level is not associated with degree of interest in solitary creative arts activities, it is associated with interest in taking up performance and group opportunities. This finding is in line with the fact that low well-being is associated with low levels of self-esteem (e.g., Karatzias et al., 2006), and the supposition that moderate to high levels of self-esteem may be necessary to allow engagement in performance and group activities of any kind.

Here, an important question is how a lack of interest in arts engagement as a result of poor emotional wellbeing may be overcome in adolescence. Fancourt and colleagues (2020) suggest that in order to encourage arts participation among individuals experiencing depression and anxiety, “the facilitator must devise experientials and directives that make participants feel comfortable in their abilities, provide them with the opportunity to work socially, and reinforce automatic (emotions, reinforcement, rewards, and incentives) and reflective motivations (beliefs about capabilities and consequences, roles, identity, intentions, goals, and optimism)”. We suggest that our pattern of findings stress the particular importance, in adolescence, of helping those with poor wellbeing also overcome social anxieties that they may have when engaging in the arts; both in terms of having an audience and in terms of working with others.

Another important question is how these findings can be used in practice. That is, how exactly arts opportunities can be tailored to personality profiles and wellbeing levels. While it would appear this is already done to some extent (with providers tweaking how a generic activity is offered to different young people according to their personalities, e.g., Larson et al., 2005)), we propose that an even more systematic approach could be taken. One sector in which personalisation has been successfully introduced is in the design of games for behaviour change (see Perski et al., 2017). There personality has been characterised using gaming-specific personality questionnaires alongside more general tools such as the Big 5 model (e.g., Orji et al., 2013; Orji et al., 2017), and it has been shown that people's personality traits are significantly associated with the perceived persuasiveness of different behaviour change strategies (Arteaga et al., 2009).

Here we propose, based on these previous contexts and our current findings, that arts providers not only carefully design arts opportunities that cater to individual differences but that all attractive features be made very salient to the targeted group when advertising the opportunities. Further, in contexts where a certain group of curated arts programs are available and there is a need to match young people appropriately, we suggest that personality characterisation - either through self-report or parent/ teacher descriptions (Kohnstamm et al., 1998) - may be collected to aid optimal mapping of program to young person. For instance, our findings suggest that to ensure they are not intimidated or deterred, young people that are identified as low in extroversion, stress tolerance and wellbeing should be recommended activities that do not seem, and indeed, are not, particularly high in performance or collaboration. We suggest that measures could nevertheless be taken to increase the amount of performance and collaboration that such young people are exposed to over time, so that they too can benefit from the strengths (e.g., boosts in self-confidence and self-esteem) that may arise such affordances of arts engagement.

### **Strengths and limitations of the study**

Initial concerns that personality may be an unreliable way of predicting adolescent behaviour (due to personality not being stable in adolescence) are increasingly allayed by research showing that changes in personality traits from adolescence to adulthood tend to be trivial (Caspi et al. 2005; Elkins et al., 2017; Roberts et al. 2001). In line with this, a key strength of our study is its demonstration of the potential power of considering personality and curiosity profiles when offering arts opportunities to young people.

Indeed, while adolescence is often seen as a period of experimentation during which mental health is negatively associated with curiosity-related risk behaviours (Galambos & Tilton-Weaver, 1998), our study highlights a beneficial side to curiosity-related behaviours. Specifically, we show that curiosity may drive interest in arts engagement, which in turn is associated with improved health and wellbeing across the life span (Fancourt & Finn, 2020).

Despite the relative strengths of the present study, there are nevertheless a number of limitations that would be important to address in future work. Firstly, while our research is based on the idea that there may be causal links from individual differences in personality, curiosity and wellbeing to individual differences in patterns of interest in arts engagement, it remains necessary to actually demonstrate this causal direction. Indeed, it is possible that the interest participants have in different arts activities (also) drives their actual patterns of participation and therefore the individual differences they show in personality, curiosity and wellbeing (e.g., Schwaba et al., 2018)

Secondly, the study uses a number of measures that were adapted from versions previously designed for use in adults. As adolescents present with different developmental constraints, contexts, opportunities and resources from adults, one may also expect differences in the types of barriers they experience. Here the approach we took – of adapting items in existing adult scales - may be considered less than optimal in terms its ability to

throw light on the unique barriers that this younger age group may face. We propose that although our approach here made comparison with adults easier, future work should seek to use adolescent-centered-theory and scales as far as possible.

Thirdly, while our Interest in Arts Opportunities questionnaire items provided a first window into how interest in the arts may be associated with individual differences, future studies would benefit from moving from participants' ratings of agreement with hypothetical scenarios ("I think I would be interested in ...") towards studying their real life decision-making and choices when faced with real opportunities. Similarly, future studies would benefit from explicitly controlling for the influence of socio-economic status and parental attitudes on interest in arts engagement. A future study could, for example, make use of the Family Affluence Scale (Currie et al., 1997), which assesses family wealth using questions young people are easily able to answer (e.g., the availability of personal rooms, number of household cars and computers, and family vacations taken in the last 12 months).

## **Conclusion**

In sum, youth engagement in the arts is fairly low; a trend which, our results suggest, may be due at least partly to low levels of motivation to engage. Our study, nevertheless, shows that certain personality and curiosity profiles may serve as potential drivers for promoting engagement in arts opportunities. Curation of opportunities to individual differences may allow young people to benefit from arts engagement's putative advantages. We acknowledge the need for future studies that are able to overcome some of the limitations of the current one. However, we hope that the present study nevertheless provides a useful foundation for future work on this topic.

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Table 1

Proportion of participants reporting each item of each barrier type

Type of Barrier	Item label	Items (In order to engage more in artistic hobbies...)	Proportion reporting “yes” to experiencing a barrier
Psychological Capability	PSC_1	...I would need to know more about different types of artistic activities (e.g. the sorts of hobbies I could take up)	0.58
	PSC_2	... I would need to feel more mentally capable (e.g. have more belief in myself, feel more positive, have better concentration)	0.66
	PSC_3	... I would need to make a plan for when and how to engage e.g. (find a class, clear time in my diary)	0.56
Physical Capability	PHC_1	... I would need to be more skilled at the activity (e.g. be able to play the piano or use knitting needles)	0.62
	PHC_2	... I would need to overcome physical limitations (e.g. find a way around physical barriers to taking part caused by an illness or disability)	0.31
	PHC_3	... I would need to have more energy or strength (e.g. not be too tired after school)	0.57
Social Opportunity	SO_1	... I would need to know more people who do the activity (e.g. see friends, neighbours or classmates being artistic)	0.62
	SO_2	... I would need to have more support from others (e.g. friends or a group who encourage me to engage)	0.48
	SO_3	... I would need to feel it is socially acceptable for me to engage (e.g. not feel unwelcome due to my age/ gender/ cultural background)	0.51
Physical Opportunity	PO_1	... I would need to have more time to do it (e.g. having time to myself or capacity away from other commitments)	0.59
	PO_2	... I/my family would need to be able to afford the resources (e.g. have the money to pay for transport, lessons, books or art supplies)	0.5
	PO_3	... I would need to have activities more easily accessible (e.g. have a class closer to my home or space in my own home)	0.49
Automatic Motivation	AM_1	... I would need to have a habit of doing it (e.g. have a weekly class)	0.68
	AM_2	... I would need to enjoy engaging in artistic activities (e.g. feel a sense of pleasure or satisfaction from it)	0.67
	AM_3	... I would need to feel more benefit when I engage (e.g. lower stress or better mood)	0.67
Reflective Motivation	RM_1	... I would need to believe that it would be good for me (e.g. know that an artistic activity could help me overcome a physical or mental health problem or help me to get a job in the future)	0.6
	RM_2	... I would need to have a goal to achieve (e.g. a performance or exhibition or a finished item to prepare for)	0.55
	RM_3	... I would need to feel more artistic as a person (e.g. feel artistic or imaginative)	0.51

Table 2

## Associations between personality variables, curiosity variables and wellbeing.

Variable	<i>M</i>	<i>SD</i>	Openness	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Joyous Exploration	Deprivation Sensitivity	Stress Tolerance	Thrill Seeking	Social Curiosity (overt)	Social Curiosity (covert)
Openness (TIPI)	4.72	1.29											
Extroversion (TIPI)	4.12	1.61	.23** [.10, .35]										
Agreeableness (TIPI)	4.61	1.41	.35** [.23, .46]	.06 [-.07, .19]									
Conscientiousness (TIPI)	4.27	1.45	.29** [.16, .41]	.17* [.04, .30]	.42** [.31, .52]								
Neuroticism (TIPI)	4.04	1.38	-.16* [-.28, -.03]	-.24** [-.36, -.11]	-.28** [-.39, -.15]	-.36** [-.47, -.24]							
Joyous Exploration (SDCR)	3.09	0.92	.36** [.24, .47]	.14* [.01, .27]	.26** [.14, .38]	.34** [.22, .45]	-.14* [-.27, -.01]						
Deprivation Sensitivity (SDCR)	3.08	0.91	.21** [.09, .34]	.05 [-.08, .18]	.16* [.03, .29]	.28** [.15, .40]	.01 [-.12, .14]	.55** [.46, .63]					
Stress Tolerance (SDCR)	2.66	0.87	.02 [-.11, .15]	.19** [.06, .31]	.13* [.00, .26]	.14* [.01, .27]	-.32** [-.43, -.19]	-.04 [-.17, .08]	-.21** [-.32, -.09]				
Thrill Seeking (SDCR)	3.28	0.84	.24** [.11, .36]	.25** [.12, .37]	-.07 [-.20, .06]	.05 [-.09, .18]	-.02 [-.15, .11]	.30** [.18, .41]	.30** [.18, .41]	-.16* [-.27, -.03]			
Overt Social Curiosity (SDCR)	3.32	0.95	.29** [.16, .41]	.14* [.01, .27]	.17** [.04, .30]	.18** [.05, .30]	-.06 [-.19, .08]	.45** [.34, .54]	.34** [.23, .45]	-.29** [-.40, -.17]	.31** [.20, .42]		
Covert Social Curiosity (SDCR)	3.30	1.01	.07 [-.07, .19]	.12 [-.01, .25]	-.08 [-.20, .06]	-.11 [-.24, .03]	.02 [-.11, .15]	.18** [.06, .30]	.07 [-.05, .19]	-.33** [-.44, -.22]	.38** [.27, .48]	.51** [.42, .60]	
Wellbeing (SWEMWBS)	18.76	5.05	.33** [.21, .45]	.19** [.06, .31]	.25** [.12, .37]	.23** [.10, .36]	-.39** [-.50, -.27]	.32** [.20, .43]	.21** [.09, .33]	.19** [.06, .31]	.05 [-.08, .18]	.16* [.03, .28]	.02 [-.11, .15]



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*Note.* *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. \* =  $p < 0.05$  , \*\* =  $p < 0.001$ .