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RUNNING HEAD: Development of Identity Fusion

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Abstract

The fusion of personal and group identities can lead to self-sacrificial pro-group behavior. Two pathways to identity fusion – via shared biology and shared experiences – have been proposed. This article elucidates a new developmental account of the origins and mechanisms of these two pathways to identity fusion from childhood to adulthood. Whereas fusion based on shared biology occurs from early childhood cued by phenotypic similarity, fusion based on episodic memories of shared experiences is not possible until mid-adolescence, and relies on suitable bonding experiences (e.g. painful initiation rituals, emotionally intense team sports, etc.). The critical development that enables fusion based on shared experiences is autobiographical reasoning, which entails connecting one's past experiences to the present self. Autobiographical reasoning begins in adolescence, which may explain the flourishing of fusion in late adolescence and young adulthood relative to other life periods. Fusion via either pathway is linked to strong pro-group behavior, both positive and negative. We outline a program of empirical research on the development of identity fusion, while addressing relevant methodological challenges. A developmental framework may help foster efforts to harness identity fusion for peaceful rather than violent forms of self-sacrifice for the group.

RUNNING HEAD: Development of Identity Fusion

The Development of Identity Fusion

Identity fusion is an extreme form of group affiliation in which individuals are so strongly bonded that they would be willing to sacrifice themselves for their group (Swann et al., 2009; Whitehouse, 2018). This sense of oneness is thought to be accompanied not by a less salient personal self, as social identity theory would predict (Tajfel & Turner, 1979), but instead by an expanded sense of personal identity in which the self is strengthened and emboldened by the group (Swann et al., 2012; Swann & Buhrmester, 2015). This difference between fusion and identification has been linked to the way in which these two forms of group alignment recruit episodic and semantic memory respectively (Whitehouse, 2013; Whitehouse & Lanman, 2014). Fusion has been shown to result from the sharing of intense experiences with other members of the group that lead to personally transformative episodic memories, such that self-defining experiences are felt to be essential to group identity (Whitehouse et al., 2017). By contrast, identification is thought to result from the sharing of semantic memories for shared identity markers that are socially acquired rather than rooted in distinctively personal experiences, leading to a depersonalized modality of group alignment (Whitehouse & Lanman, 2014).

Identity fusion theory offers a compelling new explanation of a wide range of instances of self-sacrificial behavior, from suicide bombings to extreme charitable acts (Swann et al., 2012; Whitehouse, 2018). In a number of studies, identity fusion has been shown to predict hypothetical and real sacrifices for the group better than mechanisms of group identification (e.g., Gómez, Brooks et al., 2011; Gómez et al., 2019; Whitehouse et al., 2014). Two pathways to identity fusion have been proposed (Vasquez et al., 2017; Whitehouse, 2013; Whitehouse & Lanman, 2014; Whitehouse et al., 2017): a shared biology pathway, by which perceptions of phenotypic similarity will increase fusion; and a shared experiences pathway, by which shared experiences, particularly dysphoric ones, promote

self-reflection and ultimately fusion of one's own identity with the group's identity. Yet identity fusion theory is still in its infancy, and has not yet specified how these processes might develop over the life course, and whether the ontogeny of fusion is distinct for the shared biology and shared experience pathways.

This paper is a theoretical statement on when, how, and why identity fusion develops over the life course. What is the process by which identity fusion occurs in these two pathways, and what are the mechanisms for each? How do these processes and mechanisms differ as a function of development? Most identity fusion theory has focused on adults, and on the behavioral consequences of identity fusion — especially on willingness to fight and die for the group (Swann et al., 2009). However, a cornerstone of identity fusion theory is that fusion can also have peaceful prosocial consequences (Swann et al., 2012; Whitehouse, 2013), and research confirms that identity fusion can increase prosocial behavior (e.g., Buhrmester et al., 2015, 2018; Segal, Jong, & Halberstadt, 2018). We propose that a developmental approach will best elucidate how fusion that leads to violent self-sacrifice might be mitigated or even prevented, and how fusion that leads to peaceful expressions of prosociality might be promoted. Two main tenets of the field of developmental psychopathology are that 1) understanding psychopathological development is important for our theories of typical development; and 2) understanding typical development is crucial for our theories of extreme cases (Cicchetti, 1984; Masten & Cicchetti, 2010). Thus, another benefit of our developmental account of identity fusion is that it will shed light both on these extreme cases such as suicide terrorism (Whitehouse, 2018) as well as on those with peaceful outcomes such as support for charitable causes (Buhrmester et al., 2018). Our goal is to help map out these patterns and lead to a deeper understanding of identity fusion, its processes and consequences, for better or worse.

We begin our argument by briefly reviewing identity fusion theory with adults, including an overview of the two proposed pathways to fusion. Then we set out our novel ideas of the developmental course of identity fusion, drawing upon relevant findings from the cognitive and social development literature, and differentiating from other developmental theories of affiliation, such as attachment theory. Here we propose distinct mechanisms of fusion via the shared biology versus shared experience pathways. We then focus on methodological and ethical challenges when studying the development of fusion in children and adolescents. Finally, we set out new programs of research that could emerge in response to our developmental account.

Identity Fusion Theory and Evidence with Adults

At the core of identity fusion theory is the idea that personal and group identities can be activated synergistically, such that making personal identity salient makes one's group identity readily accessible; at the same time, thoughts about the group tap into personal agency (Swann & Buhrmester, 2015). Efforts to explain how the boundary between personal and group identities becomes 'porous' in this way for fused adults have focused on two major pathways (Whitehouse & Lanman, 2014): one based on perceptions of shared biology, and the other based on the perceived sharing of personally salient experiences with other group members (see Figure 1). Since experiences can be shared with broadly two kinds of groups — relational (based on interpersonal networks) and categorical (based on identity markers held in common) — fusion can be either local (bound to a relatively small face-to-face group) or extended (to encompass 'imagined communities' too large for their members to know each other personally).

The "shared biology" pathway begins with phenotypic matching, a cross-species phenomenon by which visual, auditory, olfactory, and behavioral features of an individual are implicitly compared to kin (Gerlach & Lysiak, 2006; Park, Schaller, & Van Vugt, 2008;

Weisfeld, Czilli, Phillips, Gall, & Lichtman, 2003). Studies with identical and fraternal twins have shown that perceptions of phenotypic similarity (based on zygosity) lead to feelings of shared essence and identity fusion, and are independent of the shared experiences pathway that can also lead to fusion with a twin (Whitehouse et al., 2017). Moreover, just as cultural traditions frequently exploit the shared experiences pathway to fusion, for example via so-called 'rites of terror' (Whitehouse, 1996) ranging from painful tribal initiations to hazing in the military, many traditions also play heavily on fictive kinship and notions of shared biology, for example by emphasizing themes of common ancestry and descent or links to a common 'motherland' (Whitehouse, 2018). What all such cultural gadgets have in common is that they evoke the feelings of shared group essence that undergird identity fusion.

The "shared experience" pathway begins with sharing an emotional event with a group. Studies have focused on a wide variety of such events, ranging from the sufferings of victims of terrorist atrocities (e.g. Burhmester, Fraser, Lanman, Whitehouse, & Swann, 2014) to the ordeals of frontline combatants in revolutionary uprisings (e.g. Whitehouse et al., 2014), and from the agonizing belt-whipping rituals of martial arts groups (Kavanagh, Jong, McKay, & Whitehouse, 2018) to the passions of football fans at cup final matches (Newson, Buhrmester, & Whitehouse, 2016). What all such experiences have in common is that they trigger vivid and enduring episodic memories (Whitehouse, 1992) which in turn motivate subsequent reflection (Whitehouse, 2002). This process is particularly robust when the events in question have causally opaque features that are not readily interpretable, as is commonly the case in emotionally intense collective rituals, ranging from initiations to vision quests (Whitehouse, 2004; Richert et al., 2005). To reiterate, for a shared experience to lead to fusion, it must be emotionally intense (often negative, but hypothetically an equally intense positive experience could also lead to fusion, such as a challenging sports competition; see Kavanagh et al., 2018).

In order for an emotionally intense event to produce fusion, however, it must also have a transformative or self-defining quality (Blagov & Singer, 2004). When looking back on such experiences, people endorse statements such as: "This event marked a key moment in defining who I am personally" or "If this event had not occurred, I would be a totally different person today" (Kapitany, Kavanagh, Buhrmester, Newson, & Whitehouse, 2019). A series of studies with groups as diverse as Vietnam veterans reflecting on their experiences of frontline combat (Whitehouse et al., 2017) through to wildlife conservationists reflecting on the sufferings of a hunted lion (Buhrmester et al. 2018) suggest that the transformative-ness of experiences, and thus their impact on personal identity, are mediated by reflection (Whitehouse, 1992; 2002). Subsequent reflection on experiences thus seems to play a very important role in shaping personal identity in adulthood in ways that are necessary for fusion to occur. For example, in studies with survivors of sectarian violence in Northern Ireland, years of reflection on their experience of 'The Troubles' seem to have contributed to fusion with their respective communities; priming studies suggest that it is the reflective process on shared memories that is helping to drive the fusion effect in such cases (Jong et al., 2015).

Although many emotionally intense and transformative life experiences may lead to subsequent reflection and help to shape our personal identities, by no means do all such experiences lead to fusion. Indeed, if you feel you are the only person to have undergone such an event, especially one that evinces shame or other aversive emotions, you may feel distinctly alienated from the group and perhaps also prone to rumination (a topic to which we return below). In order for self-shaping events to produce fusion, they must also be perceived as shared with others, whether directly (e.g. Whitehouse et al., 2014) or vicariously (e.g. Buhrmester et al., 2018). When life-changing experiences are not only an indispensable part of one's personal identity but also felt to be defining moments in the history of the group (as with many flashbulb memories; Brown & Kulik, 1977), this combination produces the

feeling of shared group essence that has become a hallmark feature of identity fusion (Swann et al., 2012). Thus, not only are these experiences self-defining; they are also group-defining memories, at least in the eyes of the fused individual.

When fused in either or both of the ways described above, people experience a potent sense of psychological kinship that may lead them to make great personal sacrifices in order to advance the group's interests. As suggested by Figure 1, much of the research on this topic has focused on the role of threats to the group in motivating extreme self-sacrifice. And in many cases this focus has meant investigating people's readiness to engage in violent pro-group action, typically using a measure of willingness to fight and die for the group (Swann, Gómez, Huici, Morales, & Hixon, 2010). This emphasis on parochial altruism, targeted against outgroups, has sometimes given the false impression that the main social function of fusion is to motivate violent forms of pro-group action (Kiper & Sosis, 2018; Xygalatas, 2018). In fact, fusion alone has not been shown to motivate violent behavior in the absence of outgroup threat. And even when such a threat is present, there is some evidence that factors over and above fusion, such as the presence of violence-condoning norms, are necessary to motivate members of fused groups to attack their enemies physically (Newson, Bortolini, da Silva, Buhrmester, & Whitehouse, 2018). Furthermore, identity fusion is also clearly linked to peaceful forms of pro-group behavior, including university student retention (Talaifar et al., in press), charitable donations (Segal et al., 2018), and donations to blood banks (Burhmester et al., 2014). Thus, fusion motivates strong pro-group action, both peaceful and violent.

Developmental Course of Identity Fusion and Underpinning Processes

Despite the wealth of theory and research on identity fusion with adults in the past decade, the ontogenetic development of identity fusion along either of these two pathways has not yet been addressed in depth (but see Gaviria, Ferreira, Martinez, & Whitehouse,

2015). We propose that identity fusion first develops along a shared biology pathway in early childhood, and then via a shared experience pathway from early adolescence (see Figure 2). Local and extended versions of fusion exist within each of these pathways (see Table 1). In the shared biology pathway, the local version of fusion is focused on close family; the extended version is focused on categorical groups based on real or fictive kinship or descent (e.g. lineages, clans, ethnic or racial groups, and even some religions and nations). In the shared experience pathway, the local version of fusion is focused on relational peer groups (e.g., gangs, teams, clubs); the extended version is focused on categorical groups that are perceived to have undergone group-defining experiences together (e.g., nations, armies, cities surviving natural disasters, persecuted religious groups, embattled groups based on gender or sexual orientation etc.). Throughout, we define a group as consisting of at least two people.

Thus, alignment with categorical groups always involves an element of identification, but it could also involve extended fusion if those categorical groups are thought to share group essence, based on either biology or self-defining experiences. For instance, although there is clearly a biological element to gender identity, it does not produce phenotypic matching because all women (or all men) are not biologically related to all other women (or men). We propose that gender identification is largely based on shared socially learned identity markers, whereas extended fusion with a gender group is based primarily on shared experiences. Extended fusion with a gender group may be possible via the shared biology pathway only if the 'shared biology' element is based on kinship rather than merely having the same sexual organs. So, for example, extended fusion based on shared biology could result from emphasizing the idea of a 'sisterhood' or 'brotherhood' or other kin-like ties among members of a gender. Thus, one might imagine that all girls or women are in some sense like their actual sisters (with whom one is fused based on shared biology). In such a scenario, feelings of kinship would presumably be projected onto a categorical tie to all

females as a fictive sisterhood. We predict, however, that extended fusion to gender is more commonly based on perceived shared experiences, such as male domination or childbirth, and that the notion of a sisterhood of all women is more likely based on shared sufferings (see Tasuji, 2019).

Because one's affiliation to groups is intimately tied to one's personal identity, we review below the development of group affiliation in relation to the development of self-understanding. Because the shared experience pathway depends on remembering and reflective processes about self and groups, we also take into account the development of autobiographical memory, autobiographical reasoning, and perspective-taking. However, because most of the developmental research we review was not specifically designed to differentiate between fusion accounts and other theories of social identity, the extant research will not allow us to arbitrate among these different theoretical perspectives. Instead, we draw upon prior research in order to offer an alternative framing of the findings from the perspective of our new developmental account of fusion. Considering alternatives to dominant paradigms could open up opportunities for new lines of research that may eventually adjudicate between competing frameworks.

Identity fusion via the shared biology pathway. We propose that both local and extended fusion via the shared biology pathway are possible in early childhood, with local fusion to family developing in the first year of life, and extended fusion to kin-like groups developing from as early as 3 years of age (see Figure 2). On the basis of the developmental evidence, we argue that fusion in early childhood via the shared biology pathway is typical, if not inevitable.

In the first few months of life, infants can readily differentiate their own mother from other mothers, relying on olfactory, visual, and auditory cues (DeCasper & Fifer, 1980; Kisilevsky et al., 2003). In the next few months, infants begin to strongly prefer their own

parents to other adults (Ainsworth et al., 1978; Thompson, 2013). These behaviors in the first year of life are purely on the basis of kin-recognition mechanisms of familiarity and phenotypic matching; they do not yet entail a conceptual understanding of the self or others, nor do they yet entail bias against humans who are not in one's own gender or racial group.

We propose that this early recognition and later preference for close family in the first year of life are indicative of the shared biology pathway of local fusion. Given the mechanism of phenotypic matching, we predict that this shared biology form of local fusion would also apply to babies growing up in adoptive families, based on familiarity and observed similarity of behaviors. Just as these early behaviors do not entail a conceptual understanding of other, nor do they entail a conceptual understanding of self. Park et al. (2008) point out that phenotypic matching does not require an awareness of one's own features in order to infer kinship; individuals can assume kinship on the basis of similar features shared among other members of the family. In the first year of life, self-awareness (like awareness of other) is based primarily on visual and proprioceptive cues, by which infants are aware of their own bodies and movements as distinct from others' bodies and movements – the self-as-subject or *I* in William James' (1890) terms. For instance, even 3-month-old babies discriminate in looking studies between a view of their own legs from an observer's perspective versus from their own perspective (see Rochat, 2015).

Conceptual development of self and other occurs in the second and third years of life. We propose that these conceptual advances support the possibility of extended fusion via the shared biology pathway. In order to fuse with an extended group, such as gender or race, children must first have an awareness of group categories and of self. For instance, children's ability to perceive social groups relies on a process of categorizing humans who are alike in some way, and differentiating them from other humans who are unlike others on that same dimension. This basic categorization process of placing humans together into groups begins

in infancy, when looking paradigms show that even 3-month-old babies can distinguish amongst human faces as a function of others' gender and race based on visual features, and auditorily among native and non-native languages (Mehler et al., 1988; see Pascalis et al., 2011; Rochat, 2015 for reviews). But it is not until the second and third years of life that a conceptual understanding of self and others begins to develop, with self-awareness leading the way.

For instance, between 15 and 24 months, typically developing toddlers become capable of a primitive form of self-awareness based on visual recognition of their own features in mirror and photo tasks (Lewis & Brooks-Gunn, 1979; Stapel, van Wijk, Bekkering, & Hunnius, 2017), which James (1890) called the *me* or self-as-object. Soon after this conceptual milestone, toddlers begin to label themselves and others according to gender and age (Stipek, Gralinski, & Kopp, 1990), a phase which McAdams (2013) termed the self-as-actor. These developments are quickly followed in the third year of life (from 24 to 36 months) by a conceptual understanding of who belongs and does not belong to family groups (Newman, Roberts, & Syre, 1993) and identification with one's own gender group. In the preschool years (from age 3 onwards), children's self-concept continues to develop apace with their understanding of others. At this age, they become able to describe their behavior and predilections along a number of dimensions, such as their achievement orientation, their willingness to take physical risks, and their preference for being alone versus being with others (Eder, 1989).

Thus, by the preschool years, children have developed a basic understanding of self and of others – as individuals and as groups. At what point, however, could these alignments with groups be considered extended fusion? An important piece of evidence in this regard is the point at which children start to practice ingroup bias, showing that they prefer their own group to the outgroup and will act accordingly. Critically, this bias does not occur

simultaneously with children's ability to understand self and other; instead, bias occurs later. For instance, although infants can discriminate faces based on gender and race, and toddlers can identify themselves as a boy or a girl, they do not yet discriminate against the other gender or race. As soon as they do begin to reliably identify self and others by gender, however, their gender-stereotyped play and friendship preferences increase dramatically (Fagot & Leinbach, 1989). By age 3, children reliably prefer to play with other children of the same gender, and they engage in biased resource allocation in favour of their own gender (see Shutts, 2015 for a review). Racial bias occurs later than gender bias – not until about age 4, although racial bias varies as a function of the child's own race and the racial composition of the child's environment. Auditory cues such as another child's accent are stronger determinants of friendship preferences for preschool children than is race (Kinzler, Shutts, DeJesus, & Spelke, 2009); in our hunter-gatherer past, accent was a better marker of outgroups than skin color, because neighboring groups did not differ in skin color (Cosmides, Tooby, & Kurzban, 2003). Gender bias also appears to be stronger and less mutable than racial biases in adults (see Kurzban, Tooby, & Cosmides, 2001).

Once ingroup preferences start to occur, they are robust and quick to form. In the preschool years, children affiliate readily with non-family groups, even those which have just formed based on arbitrary criteria (e.g., t-shirt color), as the minimal group affiliation paradigm shows across many studies (see Dunham, 2018, for a review). In these minimal group affiliation studies, preschool children (especially from age 5) reliably show biases toward the ingroup in terms of preferences and resource allocation, and they attend to and learn more readily from those in their ingroup than from those in the outgroup. Dunham (p. 780) concludes that "our species is powerfully predisposed towards ingroup favouritism from early in development."

At present, we cannot ascertain whether this favoritism toward a categorical ingroup should be considered evidence of identification or of extended fusion (Tajfel & Turner, 1979; see Gómez, Brooks et al., 2011). According to the self-categorization theory of social identity (Turner et al., 1987; Turner et al., 1994) individuals stereotype themselves in accordance with characteristics of the ingroup, such that an individual will confuse self-traits with ingroup traits more than they will confuse self-traits with outgroup traits. Bennett and Sani (2008) showed that this confusion is happening in children as young as age 5; as such, their social identities depersonalized the self. Yet this group identification is distinct from fusion, because fusion is a process by which the personal self becomes emboldened, not depersonalized (Swann et al., 2009).

In our efforts to clarify the conceptual differences between fusion and identification, and distinguish the pathways that give rise to them, we are obliged to reinterpret evidence that was not gathered with our framework in mind but was originally taken to support quite different perspectives. An additional complication here is that, in our proposed framing, extended fusion may entail the projection of fused relational networks (resulting from directly shared personally transformative experiences) onto categorical groups with which people are identified (based on the sharing of socially learned identity markers). As such, extended fusion may be understood as a hybrid form of group alignment incorporating elements of both fusion and identification, making it much harder to draw a sharp dividing line between the causes and consequences of each. Since most previous research by social identity theorists was not designed with these considerations in mind, it cannot easily resolve such problems.

To sum up, we propose that early emerging local fusion with family is based on phenotypic matching – the recognition of closely related kin based on physical and behavioral cues ranging from perceived similarities in facial features, bodily odors, speech,

and behaviors (e.g. observing a sibling breastfeeding with one's mother). That is, local fusion to family (and potentially also fusion with extended groups such as other members of one's gender, language, or race) is not yet formed on the basis of shared memories. Children's memory for unique events is developing from infancy with the advent of delayed imitation of a one-time event from 6 months of age (Barr, Dowden, & Hayne, 1996), and with their verbal references to specific past events from 18 months (Fenson et al., 1994; Reese, 1999). Children's burgeoning autobiographical memory at this age is based on their early self-awareness (Harley & Reese, 1999), but these memories are not yet considered episodic in the sense of "I recall this specific experience at this particular time and place" (see Perner, 2000; Reese, 2009). Instead, it is not until age 3 (or, arguably, even later) that children become capable of truly episodic memory (Hayne & Imuta, 2011; Perner & Ruffman, 1995; Scarf, Gross, Colombo, & Hayne, 2013). Children's meta-cognitive awareness of their memories as personally experienced occurs even later in early childhood (see Reese, 2009). Clearly, the occurrence of robust patterns of minimal group affiliation from age 3 is evidence that group bonding can occur in the absence of shared experiences, or episodic memories of those experiences, but we do not yet have a valid method for discerning whether this group bonding is identification or if it is fusion.

One might argue that fusion via the shared biology pathway is akin to attachment (Bowlby, 1969), and that there is no need to posit a new term or mechanism for these early group bonding phenomena. Indeed, attachment to caregivers is a fundamental process in infancy and early childhood in all mammalian species. Across cultures, over the first year of life, infants begin to reliably use their primary caregivers as a base for exploration of the environment (Ainsworth et al., 1978; see Thompson, 2013 for a review). The quality of this attachment to caregivers – whether secure or insecure – varies across dyads and is relationship-specific; a young child can be securely attached to one caregiver and insecurely

attached to another. The quality of each attachment relationship is in large part a function of the primary caregivers' sensitivity of responding in the first year of life, although the security of the attachment relationship can change over time as environmental conditions change, for better or worse.

Fusion based on the shared biology pathway, however, is not synonymous with attachment security. First, fusion occurs with respect to multiple family members (siblings as well as parents and other close family) based on kin recognition. For instance, siblings can become fused to the extent that they will sacrifice themselves for each other, especially in the case of monozygotic twins (Vazquez, Gómez, Ordoñana, Swann, & Whitehouse, 2017). In contrast, early attachment is specific to children's caregivers, who are almost always adults. The attachment bond is thus distinct from the child's emotional and social bonds with siblings (Ainsworth, 1989; Bowlby, 1969/1982). Although there are certainly emotional bonds between siblings across cultures, an attachment bond with a sibling in Western cultures is rare (Teti & Ablard, 1989) and would only occur in cases when an older sibling is consistently in a caregiving relationship with a younger sibling. Sibling caregiving does occur frequently in non-Western cultures and in larger families (Cicirelli, 1995; Updegraff, McHale et al. 2011), and only in those instances would we expect to see an attachment bond forming with the sibling caregiver. In early adolescence, attachment to siblings starts to occur more frequently, but remains weaker than attachment to parents (see Buist et al., 2002). In contrast, fusion via the shared biology pathway is hypothesized to occur with all family members from early childhood and across cultures, and is a more general social bond. Relatedly, whereas fusion is group oriented, motivating action to support the group regardless of personal cost, attachment is focused on the self, from the child's care-receiving perspective.

Moreover, whereas attachment quality varies as a function of the child's interactions with that caregiver over the first few years of life (and beyond), we propose that local fusion

to close family relies on an earlier and more basic process of phenotypic matching. For instance, an adopted baby would become attached to their adoptive parents, and not to their biological parents, unless they had experienced frequent interactions with their biological parents. However, a child raised in an adoptive family could become fused with a biological parent even if they had only infrequent contact, on the basis of phenotypic matching.

Thus, the only requirement for local fusion via the shared biology pathway is an evolved capacity for phenotypic matching, which is achieved in the first year (if not first months) of life. Later in early childhood, children's conceptual understanding of self and others enables extended fusion to cultural groups, such as tribe, race, ethnic group, or nation, where social cues relating to shared ancestry are present.

Identity fusion via the shared experiences pathway. We propose that it is not until adolescence that fusion via the shared experience pathway becomes possible (see Figure 2), but the individual elements that coalesce to create this qualitative shift are accruing from childhood in the domains of autobiographical memory, self-concept, group affiliation, and perspective-taking. In the memory domain, children's ability to recall, narrate, and evaluate personal experiences is developing rapidly from early childhood into middle childhood (Bauer, Larkina, Guler, & Burch, 2019). Over this transition, children increasingly provide episodic details (specifying where and when and why it matters as well as what happened) in their narratives of specific events (Piolino et al., 2007). These detailed episodic memories and the resulting narratives are a cornerstone of the shared experience pathway to fusion. In order to view a shared experience as self-defining or transformative, one must first recall that experience in detail, both the facts of the event and the emotions of self and others. Soon after children become capable of narrating life events in detail, especially between ages 10 and 12, they are starting to group similar events together into lifetime periods, such as "when I was in primary school" or "when I was a baby" (Chen, McAnally, & Reese, 2013; Reese, Yan,

MacDonald & Hayne; 2010). Chunking events together in this way is a hallmark of a higher level in the self-memory system, following individual event memories and general memories (Conway & Pleydell-Pearce, 2000). By age 15, when telling their life stories, nearly all adolescents are grouping events together into lifetime periods (Chen et al., 2013; see also Thomsen, Steiner & Pillemer, 2016). Chen and colleagues proposed that this chunking of events into lifetime periods is a precursor to a mature life story. Finally, semantic knowledge of cultural life scripts (Berntsen & Rubin, 2004) – the significant (mostly positive) events that are expected to occur in a typical life – is also developing in middle childhood and adolescence and is a precursor to coherent life stories (Bohn, 2010; Bohn & Berntsen, 2008).

Adolescence marks the beginning of the reminiscence bump, a period spanning from age 15 to 30 years during which young people across cultures encode and retain episodic memories in a stronger and more enduring way than at any other time in their lives (Conway, Wang, Hanyu, & Haque, 2005). The reminiscence bump is present only for positive events, not negative events, which are more evenly distributed across the lifespan (Rubin & Berntsen, 2003; Glück & Bluck, 2007). The prevailing theory of this memory proclivity is that there are many events during this period that conform to cultural life scripts (e.g., first love, graduation, first job, etc.). These life scripts act as a shared template for expected life events across individuals in a culture, thus explaining the enhanced retention of these primarily positive events from this period (Berntsen & Rubin, 2002; Bohn, 2010). Flashbulb memories of significant public events, such as the fall of the Berlin Wall, may also function to fuse cohorts of young people and possibly entire generations (Bohn & Berntsen, 2007; Conway, 2013). Flashbulb memories are intensely emotional and usually socially shared (Brown & Kulik, 1977); we predict that both of these features are likely to engender fusion.

The mature life story also develops in adolescence (Habermas & Bluck, 2000; Habermas & Reese, 2015). Beginning from around age 12, but more reliably from age 15,

adolescents in diverse cultural groups connect past experiences to their current identity using a process called *autobiographical reasoning* (Habermas & Bluck, 2000; Habermas & de Silveira, 2008; Habermas & Reese, 2015; Reese et al., 2017). Autobiographical reasoning can take different forms (Habermas, 2011; Habermas & Kober, 2015; McLean et al., in press) to denote stability or change of the self over time as a result of life events, but the critical feature is the tracing of a psychological sense of self back to one's previous experiences. Autobiographical reasoning is thus the basis of one's narrative identity (Dunlop & Walker, 2013). McAdams (2013) termed this the advent of "the self as author" as adolescents integrate their semantic memory for self (the self-concept) with their episodic personal memories (the life story) (see Bohn & Berntsen, 2008).

Identity formation is considered the central task of adolescence (Erikson, 1968). Adolescents are struggling to figure out who they are across multiple domains – e.g. as a family member, a friend, a student, a worker, a romantic partner, a leader, or a follower. Prior to adolescence, children have developed a differentiated sense of their strengths and weaknesses across various domains (physical, academic, social, cultural), some of which they view as more central to self than others (Harter, 2006). In McAdams' (2013) terms, the child has added the "self-as-agent" layer to their self-concept. For instance, a child who sees herself as athletically but not academically gifted will be more upset by a loss on the soccer field than by a poor grade on a test. But it is not until adolescence or even emerging adulthood that they integrate these self-views across multiple social domains. The identity status literature has mapped adolescents' and young adults' differentiated knowledge of self extensively via the twin processes of exploration and commitment (see Kroger, 2004; Kunnen & Metz, 2015 for reviews). In basic terms, adolescents vacillate between exploring and committing to different identities before achieving a mature and integrated sense of self across personal, political, sexual, occupational domains, but not all adolescents achieve this

integration. Narrative identity is conceptually distinct from one's identity status: First, narrative identity is more encompassing than one's identity status because it comprises the unique set of life events and their meaning for each individual; second, narrative identity is continually evolving over the lifespan (King & Raspin, 2004; Lilgendahl & McAdams, 2011), whereas identity statuses are mostly resolved by the end of adolescence or emerging adulthood.

Neither can identity commitment be considered identity fusion. We instead propose that identity commitment is more likely to be akin to an advanced form of group identification. Arnett (2015) argues that identity commitment is a narrow and ethnocentric notion of identity when viewed from a global perspective. We agree, and would add that both identity commitment and group identification are based on scripts and schemas acquired socially from others and stored in semantic memory, rather than being formed through episodic memory and personal reflection. In that sense identity commitment, even though it concerns one's self-image, is paradoxically also depersonalizing. At the same moment that one declares oneself to be queer or cis-gender, conservative or liberal, clever or sporty, one is buying into ideas that are self-evidently not of one's own creation but belong to the cultural milieu into which one has been socialised.

In the group arena, children in middle childhood in industrialized societies are joining more formal groups (adult-structured such as sports teams and musical groups) and informal groups (self-formed clubs). Children are thus identifying readily with various groups in middle childhood and are forming friendships, mostly with other children who are like them in terms of gender, age, race, ethnicity, and SES, as well as based on shared interests and levels of peer acceptance (Haselager, Hartup, van Lieshout, & Riksen-Walraven, 1998; see Rubin, Bowker, McDonald, & Menzer, 2013 for a review). At the same time that they are forging a personal identity, toward the end of middle childhood and in early adolescence,

children's desire to belong to peer groups increases dramatically. Young adolescents form small groups of same-sex friends (cliques) that merge together into crowds (e.g., nerds, normals, jocks, emos). This reliance on cliques and crowds lessens in late adolescence as young people form romantic relationships, mixed-sex peer groups, and more fluid identities. Newman and Newman (2001) labelled this conflict *group identity versus alienation* to complement Erikson's (1968) *identity versus role confusion* stage. Newman and Newman proposed that early adolescence is a critical stage in the development of one's group identity; the need to belong is extremely strong at this age, and occurs prior to mature understanding of the self. That said, there is less psychological research on children's group identities in middle childhood (e.g., Brown, Alabi, Huynh, & Masten, 2011; Nesdale, Durkin, Maass, & Griffiths, 2004; Newman & Newman, 2001; Rutland, Killen, & Abrams, 2010) than on self-concept over this period. This imbalance may be due to the Western privileging of individual identity over group identities (Arnett, 2015). In fact, group identity is most likely a more primitive need than personal identity across cultures and historical epochs (Newman & Newman, 2001), as evidenced by the existence of rites of passage in traditional societies in adolescence as an entry into the larger social group.

Nor are theorists certain how self and group identities are linked in middle childhood and early adolescence. Older children and young adolescents who experience alienation from formal, structured peer groups may be drawn into informal peer groups without adequate adult supervision (see Newman & Newman, 2001). For instance, a young adolescent who does not view himself as competent in any of the ways that society recognizes (athleticism, academic prowess, artistic skill) may choose to affiliate with peers who are equally disenfranchised, and together they may begin to engage in delinquent activities (Rubin et al., 2013).

For the present argument about the shared experience pathway to fusion, however, the crucial element is that by the end of childhood, children have developed an understanding of group identities and how they fit into those groups (or not). In early adolescence, they are starting to develop social-cognitive capacities that will allow them to adopt a new level of personal identity (one that is constantly added to through life like the rings of a tree) and also potentially a new kind of group alignment based on the effects of shared experience (analogous to the effects of high winds and hard winters on other trees in the forest). As a result, one may be fused in dyads, relational networks, or to extended group categories.

Thus, despite children's considerable advances in autobiographical memory, self-concept, and group affiliation over middle childhood, we argue that children are not yet capable of identity fusion via the shared experience pathway, due primarily to their still developing autobiographical memory skills. Specifically, we propose that the shared experience pathway to fusion is possible only once adolescents are able to reflect on past experiences with reference to the past self (autobiographical reasoning). Alongside autobiographical reasoning, adolescents are also developing a sense of shared experience with the group. Their memories are their own, but they may now perceive those memories as more or less shared with other group members.

This phenomenon of "shared attention" or social tuning is prevalent in adults, and can occur even in the absence of a physical presence with others if an event is perceived to be shared (Shteynberg, 2015, 2018). To the best of our knowledge, however, despite the wealth of research on joint attention in infancy (Tomasello, 1999), there is no extant research on the continued development of shared attention in adolescence. We suspect that the origins of a sense of shared experience lie in the advanced social understanding skills that emerge in adolescence. For instance, Selman (1980) proposed that young adolescents only achieve third-party perspective-taking capacities at around ages 10-15. This level of perspective-

taking may enable a sense of shared experience from the perspective of a small group which, along with autobiographical reasoning, would enable local fusion via the shared experience pathway. This new level of perspective-taking also enables the phenomenon of the *imaginary audience*, by which young adolescents are frequently seeing themselves from the perspective of others, but due to their still emerging skills, they sometimes have difficulty distinguishing thoughts about their own thoughts from thoughts about others' thoughts (Alberts, Elkind, & Ginsberg, 2007). Combined with the desire to belong to peer groups, this perhaps inflated sense of external surveillance and evaluation in early adolescence — *adolescent egocentrism* — seems to provide fertile ground for fusion to non-family groups. Selman (1980) proposed that from age 14 onwards, adolescents develop societal perspective-taking, such that they can view their own and others' mental states from the perspective of larger societal values. Recent evidence shows that adolescents' perspective-taking is indeed still developing into adulthood, especially in their ability to apply their knowledge of another's perspective in real time (e.g., Dumontheil, Apperley, & Blakemore, 2010; cf. Hughes & Devine, 2015). This highest level of perspective-taking would seem to support extended fusion via the shared experience pathway.

Once again, identity fusion via the shared experience pathway is distinct from attachment processes. Adolescents growing up in family groups retain a primary attachment to parents, but as they grow older, their attachment to peers grows in the sense of using close friends and sometimes siblings as a secure base in addition to their parents by the end of the teenage years (Buist et al., 2002; Nada-Raja et al., 1992). Attachment to parents and attachment to peers are seen as parallel processes, with a secure attachment to parents predicting and correlating with a secure attachment to peers (Sroufe, Egeland, Carlson, & Collins, 2005; Teti & Ablard, 1989; Thompson, 2013). We predict the opposite pattern for strong levels of fusion to family in early childhood. Rather than strong family fusion in early

childhood begetting strong fusion to non-family peer groups in adolescence, we instead predict that strong family fusion in early childhood will conversely predict *weaker* fusion to non-family peer groups in adolescence and young adulthood. Strong fusion to family buffers against strong fusion to non-family groups later in development because local fusion comprises family-like ties that are hard to dislodge and replace (Gómez, Morales et al., 2011). If local fusion with close family is weak in early childhood, then we predict that those children will later be more likely to become fused with family-like groups of peers as adolescents. Most adolescents join peer groups, but the degree to which they stake their personal identity on those group identities varies (Rubin et al., 2013). Extreme peer orientation (see Fuligni, Eccles, Barber, & Clements, 2001) is a maladaptive form of peer group affiliation that we suspect is akin to, or perhaps entails, identity fusion (Claes et al., 2005; Rote & Smetana, 2015). We acknowledge that anxious attachment to parents could lead to anxious attachment to peers, which may on the surface look like fusion with respect to a strong need to affiliate with the peer group. However, careful measurement of attachment and fusion should reveal differences, with an anxious attachment to peers entailing a fear of being alone that should not be present with fusion. Alternatively, fusion with a peer group entails a motivation to act on behalf of the group when threatened, even if those actions harm the self. These pro-group actions are not part of the attachment construct, which focuses on trust, communication, and affiliation.

Emerging adulthood is a culturally variable stage of development that depends upon the time it takes for young people in a culture to become independent members of society (Arnett, 2015). In Western societies, emerging adulthood typically occurs between 18 to 25 years of age, but it can be much shorter or even non-existent in societies where young people take on adult roles while still teenagers, or even longer in societies where young people form new family groups in the midst of an extended family household (see Arnett, 2007). We

predict that local and extended fusion via the shared experience pathway will flourish in emerging adulthood as a result of the intense and enduring memories formed during this period (Conway et al., 2005), accompanied by continued increases in autobiographical reasoning (Habermas, Diel, & Welzer, 2013). These predictions are in line with existing research showing that enduring fusion bonds are formed from young adulthood (Newson et al., 2016). We expect local fusion to non-family groups will be highest in these years in cultures or countries with a confluence of weaker family bonds, relatively early ages of living independently from families of origin, and relatively later ages of child-bearing (see OECD Family Database, 2017). Conversely, local fusion to non-family groups is predicted to be lowest in cultures or countries with stronger family bonds, later ages of living independently from the family of origin, and earlier ages of child-bearing. We also predict that extended fusion would occur earlier in cultures where shared transformative experiences are widespread among members of categorical groups (e.g. persecuted religious or ethnic groups). War zones or regions affected by natural disasters are obvious examples.

Thus, we are proposing that young people in emerging adulthood from roughly age 18 to 25 or 30 years (with the exact age being culturally and individually variable) are prone to identity fusion with a non-family or family-like group to a greater degree after they have left their family of origin and before they create their own families. Indeed, existing empirical evidence documents that fusion levels are particularly high in this age range (see Rosenzweig, Ruisch, & Stern, 2018).

Developmental Trajectory of Fusion Mechanisms

We argue that the primary mechanism of fusion in the shared experience pathway is via autobiographical reasoning about shared experiences with the group. Because autobiographical reasoning entails reflection upon a memory, we outline below the development of reflective processes (as opposed to ruminative processes) over childhood and

adolescence, and we specify the types of memories that are likely to be most important for fusion.

Reflection versus rumination. The mechanism(s) of identity fusion for adults with non-family groups are still being explored. One prominent idea is that individuals' reflection on negative shared experiences within a non-family group causes fusion with that group (Whitehouse, 2013). This link is beginning to be documented empirically with adults (e.g., Jong et al., 2015; Newson et al., 2016; Whitehouse et al., 2017) and with adolescents (Tasuji, 2019). We propose that reflection (i.e., autobiographical reasoning, by which individuals causally link a past experience to the present self; Habermas & Bluck, 2000) on shared group experiences, positive or negative, will be more relevant for identity fusion than rumination. We define reflection as thinking about an event in relation to the self, but reflection does not necessarily entail talking about the event with others. Only through reflection is the memory connected to one's identity, a process that appears to occur in adolescence across diverse cultures (see Reese, Fivush, Merrill, McAnally, & Wang, 2017; Reese, Myftari et al., 2017). Rumination, on the other hand, is predicted to be unlikely to lead to fusion because of the repetitive, non-insightful nature of thinking involved. In fact, memories that are highly rehearsed, resulting in overly coherent narratives – narrativized memories – are unlikely to be connected to identity fusion because we argue that they are a form of distancing from the self in an attempt to create a socially acceptable story about an event. Thus, rumination about a shared experience is predicted instead to lead to group identification, which is about the socially shared version of a memory, but not to fusion. Likewise, the practice of savoring (Bryant, 1989) — appreciating the positive aspects of experiences — is unlikely to lead to fusion on its own. For instance, savoring an experience as it is happening can lead to later nostalgia when recalling that event (Biskas et al., 2019). Because nostalgia is a powerful

source of meaning, inducing nostalgia short-circuits the search for meaning (i.e., autobiographical reasoning; Routledge et al., 2012).

The developmental trajectories of reflection vs rumination support these ideas. As reviewed above, reflection on one's past in the form of autobiographical reasoning develops in mid-adolescence; in contrast to other aspects of autobiographical memory for which there is a female advantage (see Fivush, 2018), autobiographical reasoning is similar for boys and for girls (see McLean & Breen, 2009). Conversely, ruminative or repetitive thinking about past events begins earlier, at about age 10, and soon after (from about age 12), marked gender differences appear, with girls ruminating more than boys (Jose & Brown, 2008). Rumination continues to rise over adolescence for both girls and boys, but the gender difference remains, with girls consistently ruminating more than boys across adolescence and into adulthood (Johnson & Whisman, 2013). Because there are no reliable gender differences in identity fusion in the extant research with young adults, the gender difference in rumination is indirect support for the notion that rumination is not causal for identity fusion. There are no systematic studies of the development of savoring yet, but research with adults shows that women engage in savoring more than men, similar to rumination (Bryant, 2003).

Finally, rumination develops too early to explain the rise in fusion with non-family groups in late adolescence. For all of these reasons, we propose that it is only reflection, not rumination or savoring, that is linked to identity fusion by mid-adolescence. Yet reflection alone would not be expected to predict fusion; instead, a perceived sense of sharing an experience with the group would also be necessary for fusion to occur.

Types of memories that lead to fusion. Within the shared experience pathway, we propose that only specific kinds of episodic memories will lead to fusion: those memories that are essential to identity; memories that if extracted from the life story would fundamentally change our identity. These are more than merely self-defining memories

(Blagov & Singer, 2004); they are constitutive or essential memories for one's identity. These events can be negative or positive (Jong et al., 2015; Kavanagh et al., 2018; Newson et al., 2016), but they must be emotionally intense, enduring, and consequential. These are memories that promote reflection and are central to a clustering of beliefs about one's identity (King & Hicks, 2009). Once again, these kinds of memories and reflective processes do not regularly occur until early to mid-adolescence (Habermas & Reese, 2015).

It is plausible, especially for extended fusion via the shared experience pathway, that the events on which the memories are based do not even have to be personally experienced to be essential for one's identity and to cause fusion. Instead, it may be possible to become fused to local or extended groups based on *vicarious* or intergenerational memories that are passed down in the form of family stories (Fivush, 2018; Pillemer, Steiner, Kuwabara, Thomsen, & Svob, 2015). In fact, adolescents in more interdependent cultures (e.g., Māori and New Zealand Chinese) engage in more "biographical" reasoning about their parents' childhood memories in relation to their own identity than do adolescents in more independent cultures (New Zealand European) (Reese, Fivush et al., 2017). This fusion that arises from vicarious experiences may lead to strong perceptions of out-group threat, and corresponding extreme levels of self-sacrifice (Choi, Jackson, & Gelfand, 2018; Whitehurst, 2018).

Role of shared group experiences. We argue that this process of reflecting upon group experiences occurs privately, and that these essential memories that lead to fusion are ones that may or may not be talked about together by the group (see Fivush, 2018). In fact, we predict that too much debriefing or discussion after an intensely emotional event may actually lead to uncovering differences rather than similarities in interpretations. For fusion to occur, the individual must hold the belief, accurate or inaccurate, that his or her own interpretation of the experience is shared by other group members (a false consensus bias; see Ross, Greene, & House, 1977), and possibly the belief that other group members have

engaged in a similar reflective process. Recall that this bias in thinking is particularly intense in early adolescence when adolescents first became capable of considering themselves from a third-party perspective, but often confuse their own self-perceptions and thoughts with others' perceptions and thoughts (Alberts et al., 2007). This path from experience to memory is critical for getting from the self-shaping experience to the conviction of sharedness that is necessary for fusion.

Research on identity fusion to date has focused primarily on highly dysphoric rather than euphoric events as most important for fusion. However, we propose that highly positive shared experiences could also lead to identity fusion if they are reflected upon privately in a way that links to identity (see also Kavanagh et al., 2018). Memory research shows that once controlling for the recency and intensity of an event, the likelihood of recalling negative and positive events is similar (Walker & Skowronski, 2009), as is the quality of the resulting memories in terms of coherence and level of detail (Waters, Fivush, Merrill, & Zaman, 2013). However, the robust phenomenon of fading affect bias shows that negative emotions associated with past events fade more quickly over time than do positive emotions (Ritchie et al., 2015; Walker & Skowronski, 2009). Even though positive events may thus become more salient than negative ones over time, positive events have been shown empirically to engender less autobiographical reasoning (Reese et al., 2014) and are thus less personally transformative, which could help to explain why they have less impact on fusion than negative events. Our prediction is that either positive or negative experiences, if emotionally intense enough and perceived as shared with the group, are likely to promote reflection that then leads to personal transformation and identity fusion.

Methodological Challenges for Research on the Development of Identity Fusion

Identity fusion is a new and interdisciplinary construct; as such, the measurement of fusion, even in adult studies, is still in a state of development. For instance, although Swann

et al.'s (2009) original fusion research used pictorial measures (originally adapted from Schubert & Otten's 2002 pictorial measure of group identification; see also Jiménez et al., 2016 for a computer version), some subsequent studies favour verbal methods of assessing fusion (Gómez, Brooks et al., 2011; Newson et al., 2018). Moreover, although fusion research has been conducted across a number of cultures to date (e.g., Fredman, Bastian, & Swann, 2017; Gómez et al., 2017; Swann, Buhrmester, et al., 2014; Swann, Gómez, Dovidio, Hart, & Jetten, 2010), the transportability of fusion measures cross-culturally is an ongoing focus of discussion (Purzycki & Lang, 2019). The challenges of measuring fusion reliably and validly with children and adolescents are exponentially harder. Below we outline the main methodological issues faced when conducting developmental studies of identity fusion, formulated in light of our conceptual framework in which fusion and identification are understood to be fundamentally distinct and contrasting forms of group alignment.

Validating measures of identity fusion for children and adolescents. In order to test our theory of the development of identity fusion, existing verbal and pictorial measures of identity fusion will need to be validated for children and adolescents, or new measures created. Essentially, the pictorial measure of fusion represents an analogical reasoning task (the small circle is to self as the big circle is to group), which may be beyond the reasoning capabilities of most children and some adolescents. Children and young adolescents vary in their analogical reasoning abilities as a function of age (Richland, Morrison, & Holyoak, 2006) and culture (Richland, Chan, Morrison, & Au, 2010). Moreover, analogical reasoning skill is dependent on working memory (Simms, Frausel, & Richland, 2018) and domain knowledge (Goswami, Leevers, Pressley, & Wheelwright, 1998).

Verbal fusion measures, on the other hand, are likely dependent on children's verbal abilities. Simplified versions for children of the standard verbal fusion measure for adults are not always reliable (Gaviria et al., 2015; Tasuji, 2019). One promising avenue would be to

instead use the 3-item psychological kinship measure from Buhrmester et al. (2015), which in adults is strongly correlated with verbal fusion (r = .77; Newson et al., 2018), but is cast in much simpler language (e.g., *My (group) is like family to me).*However, this measure assesses only the relational ties component of fusion, so would need to be supplemented by additional, plainly worded measures of other components such as collective ties and reciprocal strength (see Gómez et al., 2019). Alternatively, control measures of verbal ability, analogical reasoning in non-social domains, and perhaps working memory need to be administered alongside standard verbal fusion measures to ensure that children and young adolescents understand the concepts involved. If analogical reasoning and verbal abilities are strongly related to fusion measures, then new fusion measures that are less demanding need to be developed, and validated with adults against existing measures. For instance, an existing computer version of the pictorial fusion measure (the Dynamic Identity Fusion Index or DIFI; Jiménez et al., 2016) could be adapted for children, such that the child could slide a photo of the self to overlap (or not) with a photo of their chosen group, attenuating the verbal and analogical reasoning demands. Moreover, we need to ensure that a highly fused response on either the pictorial or verbal scale means the same thing for a child versus an adolescent versus a young adult. Finally, we propose that the "fight or die" item that assesses extreme outcomes of fusion is not ethical for administration with children and adolescents below age 16, or possibly even age 18. The field needs to explore other, more ethical ways to measure extreme forms of identity fusion with vulnerable populations such as children and adolescents.

Validation of other control measures. To establish the discriminant validity of identity fusion as distinct from group identification, it will also be necessary to develop valid measures of group identification for children and adolescents. The existing self-report measure of group identification (from Mael & Ashforth, 1992) that is currently used as a

control or comparison measure in identify fusion studies was originally developed for adults (Gómez, Brooks et al., 2011). In one preliminary study with adolescents, the correlations between the group identification and fusion measures were similar in size to the correlations between the pictorial and verbal measures of fusion (Tasuji, 2019). New measures of group identification (see Gómez et al., 2019; Leach et al., 2008; Postmes et al., 2013; Rutland, Killen, & Abrams, 2010) need to be adapted for children and adolescents to test the ideas proposed above of bidirectional processes between individual and group identities from childhood to late adolescence. To distinguish between attachment and fusion processes, well-validated measures of attachment security should be included as a control in developmental studies of fusion.

Narrative measures. We propose that to truly understand the mechanisms of group identification and fusion, and to test our theory of the primary role of perceived shared experiences, the field will benefit from collecting individual narratives of shared group experiences. These autobiographical (and vicarious) narratives can then be examined for clues as to the process by which one becomes fused to a particular group. Foremost, these narratives can be coded for autobiographical and biographical reasoning, in which the individual traces a change in self back to a transformative group experience, to test our theory of the primacy of autobiographical reasoning processes.

Once these narratives are collected, however, they can be coded along other dimensions as well: using established schemes for levels of agency and communion (McAdams, Hoffman, Day, & Mansfield, 1996), reflection (Habermas & Köber, 2015; Reese et al., 2017), and emotional valence (Bohanek & Fivush, 2010), and newly developed narrative schemes for ruminative thought. The narratives could even be examined for evidence of qualitatively different alignments with the group to test processes of identification versus fusion. Many published studies of identity fusion with adults have

already collected these narratives as part of their standard procedure (e.g., Segal et al., 2018), so the first step would be to code these existing narratives with respect to the above dimensions, and then to analyse them as mediators/correlates of reported fusion on questionnaire measures. The result will be a much richer picture of the process by which individuals fuse to groups, and perhaps of their thought processes as they contemplate extreme prosocial or violent actions on the part of the group. Self-report measures of reflection, rumination, centrality of the shared event to self, and intensity and valence of the shared event should continue to be collected as control measures so that the unique prediction for identity fusion of autobiographical reasoning and rumination present in personal narratives can be assessed.

Neural evidence of fusion. Neuroscientists have identified distinct neural substrates of episodic and semantic memories (e.g., Addis & Tippett, 2008; see Martinelli, Sperduti, & Piolino, 2013 for a meta-analysis). Future research could explore the neural substrates of the self-defining group experiences proposed to be critical for fusion via the shared experience pathway. For instance, when adult believers watched videos of religious rituals, a group setting induced neural synchrony among watchers — social tuning effects — as measured by theta-phase synchrony from EEG data (Cho et al., 2018). Perhaps the study of neural substrates could even differentiate between the heightened sense of self proposed with fusion, versus the subsumed sense of self with group identification, better than the current self-report measures (see Apps, McKay, Azevedo, Whitehouse, & Tsakiris, 2018).

Implications of a Developmental Framework for Identity Fusion

The implications of a developmental framework for identity fusion are far-reaching for psychological and anthropological theory, policy, and efforts to prevent violent extremism and promote prosocial behavior. Current social-psychological and anthropological theories of identity fusion are incomplete without a developmental perspective. Until we understand

when, how, and why identity fusion begins, we are unable to fully understand it in adulthood. If we better understand the developmental course of identity fusion, we are also in a stronger position to prevent the violent consequences of identity fusion (e.g., terrorism, football hooliganism), and perhaps to promote peaceful consequences of fusion (e.g., degree attainment, charitable donations, vocational work). Thus, a developmental account of identity fusion and resulting empirical work will inform interventions aimed at de-fusing individuals or harnessing the effects of fusion in more socially acceptable ways. Below we offer some ideas for future research on these prevention and intervention efforts from a developmental perspective.

Culture and the development of fusion. Many cultural groups encourage fusion in middle childhood and adolescence via traditional rituals, including painful coming-of-age ceremonies, initiations, and boot camps. A common feature of such imagistic rituals is the explicit desire for young people to detach from family and its bonds of shared biology and instead to fuse with peer groups based on shared life-changing experiences. Although widespread in small-scale societies, especially in harsh environments requiring high levels of social cohesion (e.g. among warriors and hunters), these kinds of practices tend to be outlawed or highly regulated in more complex societies (Whitehouse, 2018). An obvious reason for this regulation is that locally fused groups, if aggrieved, can present a threat to state control, for example in the form of terrorist cells and insurgencies (Whitehouse et al., 2014). Institutions that fuse young people may therefore be authorized by the state only in elite groups (e.g. expensive boarding schools, prestigious universities, and military academies) rather than in the population at large. Thus, the development of fusion is shaped to some extent by cultural history and the evolution of social complexity. But cross-cultural differences in the development of fusion could also result from more immediate changes in environmental conditions, such as the appearance of external threat from natural disaster or

outgroup conflict and invasion (Whitehouse et al., 2017). In line with our theory that young people are more likely to fuse with new groups in adolescence if fusion to family is weak, we predict that imagistic rituals capable of creating new fusion targets in adolescence would include efforts to de-fuse participants from their families. Ample evidence for this is provided by ethnographic accounts of initiation rituals in small-scale societies, where young people are taken forcibly from their families to a secret location and forbidden to return to their family homes for months or even years (Barth, 1987; Iteanu, 1990) as well as reports on civil war armed groups that recruit child soldiers after forcing them to sever ties with family and, in some extreme cases, to kill a family member as an entry requirement (Whitehouse & McQuinn, 2012). Individuals who engage in the most extreme forms of pro-group action (e.g. violent self-sacrifice) would seem to be more likely to choose their fellows in the extreme group (e.g. brothers in arms) in preference to natal family (Whitehouse et al., 2014) as their privileged fusion target.

Social media and the development of fusion. Perspective-taking skills are continuing to develop into late adolescence (Dumontheil et al., 2010). Because of the absence of nonverbal cues in virtual exchanges, coupled with the vagaries of one's imagined audience, we predict that adolescents' perspective-taking skills may be especially fragile when engaging with others over social media. For heavy social media users, this egocentrism might lead to a heightened sense of shared experience (see Shteynberg, 2018), which in turn could lead to stronger levels of extended fusion. For instance, prior to the recent Christchurch mosque attacks, the shooter posted a pledge on the anonymous message board 8chan that he would live-stream the attacks on Facebook (Marsh & Mulholland, 2019). He was cheered on by fellow posters who pledged to save and re-upload the video so it would go viral. We suspect that his violent actions, accompanied by disregard for the consequences for himself, stem from extended fusion with White nationalist/anti-Muslim groups. This extreme level of

fusion may have been fostered prior to the attacks via engagement in the virtual world with other White nationalist/anti-Muslim extremists. New empirical research is needed to explore the effects of sharing emotionally intense experiences over the internet. This research should focus on memory and personal identity as well as on fusion and extreme self-sacrifice.

Gender and the development of fusion. There is no evidence yet that fusion would be different for men and women; preliminary research on the effects of shared experiences of childbirth among first-time mothers appear to fit the same conceptual framework developed in studies of predominantly male populations (Tasuji, 2019). We might expect different fusion targets for males and females, however, given that many local and extended group alignments in human societies have historically been quite strongly gendered. This pattern could change in post-feminist societies where higher levels of gender equality and tolerance for novel forms of gender identity and fluidity are emerging. On the other hand, it is possible that gender-based differences in the development of fusion will tend to predict persistently different forms of aggression directed at outgroups when threatened, perhaps due to hormonal differences affecting impulsivity and physical aggression in men and women (Batrinos, 2012).

Developmental considerations for defusing. How can we promote peaceful prosocial outcomes of fusion and lessen violent outcomes? The framework proposed here suggests that not all young people will fuse with peer groups, especially if fusion in the family is strong. But when children and adolescents do fuse, how can we ensure that this occurs in ways that contribute to peaceful prosocial outcomes rather than to intergroup violence, all too commonly associated with knife and gun crime, extremist groups, and hooligan gangs? Just as families may be able to inoculate young people against the appeals of violent peer groups based on shared biological essence, so too may peaceful pressure groups, based on shared experience, such as the recent climate strikes inspired by Greta Thunberg's

climate activism. Other examples for today's teens include adventure Scouts groups, the Outward Bound movement, and the Spirit of Adventure voyages. These organizations arguably provide the modern-day equivalent of tribal initiation rituals, in that all involve physically arduous, even painful, outdoor experiences. For instance, the 10-day Spirit of Adventure experience starts each day with a 6 am swim in the ocean. When shared with a group of peers, such emotionally intense and often dysphoric experiences increase a sense of group belonging and also predict long-term increases in self-esteem and resilience (Scarf, Hayhurst, et al., 2017; Scarf, Kafka, et al., 2018; Scarf, Moradi, et al., 2016), with stronger effects in the short-term for at-risk youth (Arahanga-Doyle et al., 2019; Koni et al., 2019). We propose that local fusion to non-family groups can also be transferred to other non-family groups (cf. Fredman et al., 2015). A prime example of this transfer occurs in military recruitment; anecdotally, military recruiters report that members of street gangs are good targets. Perhaps defusing (Gómez et al., 2019) or fusion transfer could also occur from gangs to prosocial peer groups such as Outward Bound or the Spirit of Adventure. Current research is addressing this possibility (Scarf, 2019).

Conclusions

We have proposed a model of the development of identity fusion that is based on childhood processes of kin recognition and adolescent processes of autobiographical memory development. Our model is based on a highly interdisciplinary approach drawing on anthropology, group psychology, identity research, memory research, evolutionary modelling, and neuroscience, using evidence from all these areas to construct a plausible developmental perspective. We have also discussed some of the key methodological challenges that will need to be addressed in order to test our model empirically. Despite the challenges, we have argued that a better understanding of the underpinnings of identity fusion and how it emerges in ontogeny is necessary to promote fusion for prosocial outcomes and

lessen fusion for violent outcomes. We hope that these ideas spur new research into these developmental processes for positive social change.

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Figure 1. Two pathways to fusion (cf. Whitehouse, 2018).

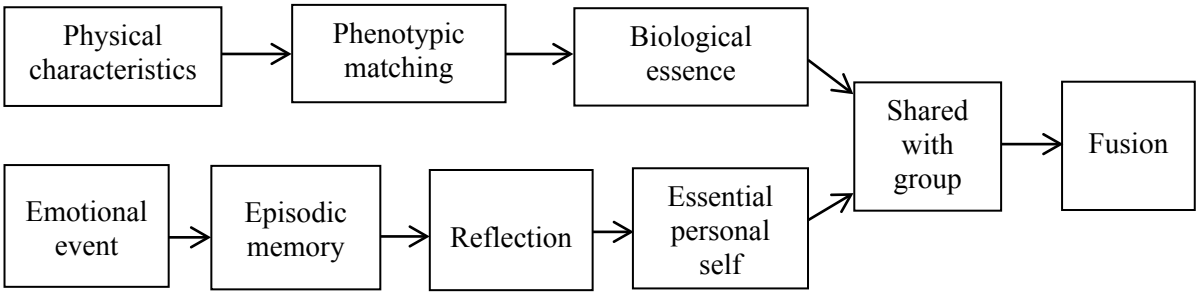

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Figure 2. Timeline of proposed development of identity fusion.

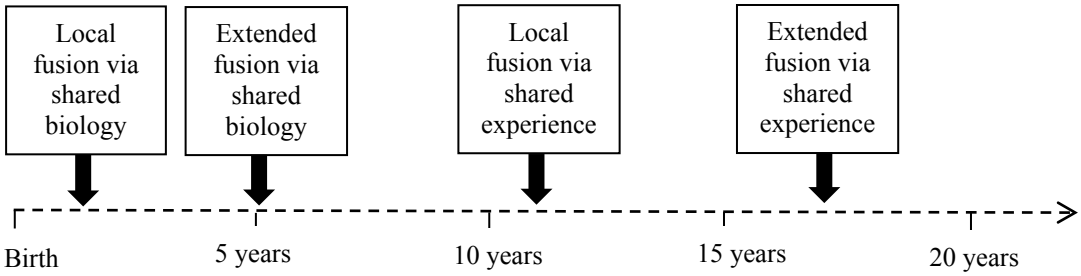

Table 1

Examples of Local and Extended Fusion Via Shared Biology and Shared Experience Pathways

	Shared biology pathway	*Shared experience pathway*
Local fusion targets	Close family	Clubs, teams, gangs
Extended fusion targets	Ethnic/racial groups	Football clubs; persecuted religions; gender groups