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How Identity Fusion Predicts Extreme Pro-Group Orientations – A Meta-Analysis

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Identity fusion theory is hypothesized to predict willingness to engage in extreme pro-group behaviors. Identity fusion argues that violent extremism and extreme pro-group actions are driven by a visceral feeling of “oneness” with the group, wherein both collective and individual characteristics facilitates group alignment and the fusion of the group and individual identities and goals. An extensive body of research has investigated the nature of identity fusion in a wide range of group contexts, countries, and types of extreme pro-group behaviors. However, results are heterogeneous, and no systematic assessment of the relationship between identity fusion and extreme pro-group behaviors have been conducted to date. The present paper conducted a meta-analysis addressing the quantitative aggregated effect of identity fusion with respect to extreme pro-group behaviors. Robust variance estimation (RVE) regression models were fitted to 106 effect sizes (from 57 articles). Models tested the overall averaged effect as well as potential moderating effects of age distribution, gender distribution, country, target group of identity fusion, and measurement instruments of both identity fusion and extreme pro-group outcomes. Further, the analysis addressed whether identity fusion exhibited a stronger relationship with extreme pro-group outcomes than did social identification. Effect sizes were operationalized as Pearson correlations and were converted to *z*-scores for variance estimation. Results indicated a strong association between identity fusion and extreme pro-group outcomes ($r=.71$). This association was stronger than what was observed for social identification. The relationships appeared to be significantly moderated by age, country, target group of fusion, and measurement instruments. Hence, results support the theory of identity fusion as explanatory of extreme pro-group behaviors, and further indicate that this relationship is stronger than was that of social identification and extreme pro-group actions. Further, the effect of identity fusion seems to be moderated by a range of contextual and cultural variables, which should be addressed more extensively in further research. The study sample exhibited extremely high heterogeneity, which was only partly accounted for by the moderating variables. This suggests that the field should aim to obtain more robust and aligned methodologies, including longitudinal and experimental designs and more consistent use of measurement scales.

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1 What makes people commit to extreme pro-group behaviors?

Twenty years ago, four airplanes carrying hundreds of passengers and crewmembers were hijacked by Al-Qaida terrorists. Two of the planes hit the World Trade Centre in New York City, one targeted the Pentagon building in Washington DC, and the last plane crashed in a field outside Pennsylvania. The attacks of 9/11 are clearly among the worst and most consequential terrorist attacks in recorded history. The incident represents a watershed moment in history that has shaped geopolitics and human life, and the economic and military consequences reverberates to this day. However, they are not unique in the sense that, like most terrorist attacks, the perpetrators acted not on behalf of themselves or purely egotistic motives but rather on behalf of a group or cause. The group that committed the attack had spent years training to become certified commercial airline pilots. Not with the intent to find a good job and care for their families, but rather to inflict maximum terror and casualties at the cost of their own lives and the wellbeing of their families and loved ones. The dedication and terminal sacrifices committed by the terrorists are indicative of a level of personal alignment to group goals that promote behavior which greatly outweighs concerns for personal safety and wellbeing. Similarly, across the world and even in countries such as the Scandinavian countries, which benefits from uniquely high living standards and liberties for most people, people tend to engage in extreme activities on behalf of distant group agendas, oftentimes lacking a salient formal, demographic, or cultural attachment to the group or cause. For instance, several ethnic Scandinavian individuals has committed to seeking group membership in extreme and violent islamist organizations, leaving their friends and family behind to embark on a long and arduous journey to receive indoctrination and training for months and years, before causing acts of unspeakable cruelty and violence. Others too, seek involvement in dangerous group actions, such as ideal organizations in warzones, that are clearly motivated by idealistic and altruistic tendencies whereas other commit their lives to engage in warfighting based on notions of good and evil which is readily observed in the war in Ukraine. In every case, the question as to what the underpinnings of the resolve are to leave a safe and prosperous environment to pursue group goals with potentially hazardous outcomes is a fundamentally important question to ask.

The different levels of analysis and possible explanations ranges from biology to the social sciences and beyond as to the underlying mechanisms and drivers of such extreme acts, and the literature on terrorism and extremism is represented by a plethora of different theoretical frameworks and concepts. One psychological theory of group alignment that has

gained particular traction over the past decade is identity fusion (Swann et al., 2009). This theory is concerned with intragroup dynamics and how a sense of being one with the group and its individual members can motivate personally costly pro-group behaviors (Swann & Buhrmester, 2015). Since its conception the theory has seen increased attention in a multi-disciplinary field of researchers, including social- and political psychology (Fredman et al., 2015; Kunst et al., 2018; Talaifar & Swann, 2018), anthropology (Michael D. Buhrmester et al., 2018; Newson et al., 2018), neuroscience (Apps et al., 2018; Hamid et al., 2019) amongst others (Gómez et al., 2020). The theory is predominantly applied to predict willingness to exhibit extreme pro-group behaviors, but conceptually it offers a model for the interplay between individuals and ingroups considered at the level of personal- and social identities, and how these interacting levels contribute to formation of strong, even familial-like bonds, increased motivation for pro-group action, reciprocity, and stable adherence to group memberships. Albeit a theory with unique conceptual characteristics, in the broader field of intergroup dynamics (wherein identity fusion has seen extensive application) a debate is going as to whether identity fusion is in fact a mere reconceptualization of the seminal theory of classic social identification (Tajfel et al., 1979), rather than an independent framework (Babinska & Bilewicz, 2018; Vignoles, 2018).

There are seemingly good arguments for both perspectives, some of which will be elucidated in this thesis. However, since its formal conception in 2009, research has demonstrated significantly higher predictive and explanatory validity in terms of extreme pro-group behaviors and intentions, compared to social identification (Bortolini et al., 2018; Gómez et al., 2020). Meanwhile a thorough and comprehensive statistical review of the field is missing, and several factors could interfere and complicate the conclusions. As such, this thesis aims to contribute to the debate and development of identity fusion by providing a meta-analysis focusing on several key aspects related to the theory and its applied settings. The continued interest and use of identity fusion in various fields of the behavioral sciences warrants an investigation into its proposed predictive superiority. In order to facilitate the analysis and subsequent deductions the following will outline the conceptual features of identity fusion as well some key theoretical contrast to classical social identification that are relevant to the main analytical component of the thesis.

2 The construct and evolution of identity fusion

In an attempt to explain the mechanisms driving violent extremism and extreme pro-group behaviors, identity fusion theory (Gómez & Vázquez, 2015b; Swann et al., 2012; Swann et al., 2009) argues that extreme pro-group actions are driven by a visceral feeling of “oneness” with the group wherein both collective and idiosyncratic characteristics are manifesting group alignment and channeling of personal agency in the service of group agendas. The theory revolves around intragroup processes but has seen similar applications (i.e., predictor of extreme pro-group behavior and intentions) as the more renowned theory of social identification which is concerned with intergroup dynamics and formations. Unlike social identification, however, identity fusion theory permits interplay between personal and social selves in group settings whereupon the respective identities are proposed to overlap and become one, without the abdication or loss of its respective characteristics. A person becomes fused when he or she experiences a partial or complete overlap of personal and social identities.

2.1 The four principles of identity fusion

In the early years since the theory was formally published, the first goal of its proponents was to provide evidence for the principles of the theory (Swann et al., 2012). In doing so, the principles were established to be conceptually sound and backed up by a significant amount of empirical data. The principles offer a conceptual understanding of how fusion is proposed to work, and possible explanations for the alleged superior predictive and explanatory value. However, the extent to which these principles contribute to the statistical and predictive capacity of the paradigm remains an open question which will be revisited in this paper.

2.1.1 The agentic-personal-self principle

The principle of personal agency denotes how the personal self contributes to group behaviors. According to identity fusion the individual characteristics and traits of group members are acknowledged and remains intact during group interactions, and individual identities are proposed to contribute rather than being attenuated by the group setting. This is proposed to facilitate channeling of personal agency in favor of group goals (Swann et al., 2009). In line with this principle, the self-perceived personal agency of individual members

fosters increased motivation for group action, as the agents maintains authorship of its deeds. Furthermore, upon contributing personal agency it follows from this principle that a sense of reciprocal strength is attained. As such, pro-group acts are proposed to foster reciprocal acts from ingroup members. To provide evidence for the principle, researchers sought ways to manipulate personal agency. Increased autonomic arousal is proposed to promote a sense of agency and experiments showed that individuals with increased physiological arousal expressed increased willingness to fight and die for the group (Swann et al., 2010). Even if this evidence can seem somewhat conjectural, the effects of physiological arousal on notions of personal agency has been replicated in other studies with an impact on willingness to engage in extreme pro-group behaviors and self-sacrifice (Gomez et al., 2011; Kavanagh et al., 2019).

2.1.2 The principle of identity synergy

The principle of identity synergy posits that personal and social identities interact synergistically to enhance pro-group behaviors (Gomez et al., 2011). The general notion is that both levels of identity remain active and fully intact during social interactions, and since fusion maintains that individuals can display group behaviors without the abdication of personal identity, both identities are promoting enhanced dedication to group goals (Swann et al., 2014). The main body of evidence for the identity synergy principle revolves around manipulations of either category of identities (i.e., personal, or social). For instance, it has been demonstrated that challenges to personal-self fosters compensatory behaviors at the group level, and that manipulation of personal or social identities through threats to either category influences the decision making in favor of the ingroup on a modified intergroup trolley dilemma (Gómez et al., 2011). In a more recent study, Heger and Gaertner (2018) demonstrated that the synergistical nature of identities promotes group-serving and self-serving behavior, where the group expressed to willingness to fight and sacrifice for the individual members, and the individual members expressed willingness to fight and sacrifice for the group. Notably, this tendency did not extend to increased willingness for dying for the individual members or the group. This evidence is indicative of the prevalence and impetus of both identities of highly fused individuals in group settings.

2.1.3 The principle of enhanced relational ties

According to identity fusion, interactions between identities enable ingroup members to recognize each other, not just in terms of their group membership and social identity but also with respect to their individual uniqueness and distinctiveness. As such, relational and collective ties are formed (Swann et al., 2009). This, in turn, is proposed to induce a visceral feeling of being one with the group, whereupon challenges and group issues become a personal matter, and a strong sense of reciprocal strength (i.e., own actions foster reciprocal acts from other group members) is attained. In this manner exceptionally strong familial bonds are proposed to be formed. At the group level it is evident that strengthening the notion of shared characteristics (e.g., genetic similarity, socio-cultural contingents, and history) promotes enhanced relational ties (Whitehouse, 2018), whereupon fusion can occur by extension to others who are not imminently close in a group setting (Swann et al., 2014). This form of extended fusion is proposed to explain the tendency for individuals to become highly fused with country of origin and fellow citizens a priori (Atran et al., 2014; Swann & Buhrmester, 2015).

2.1.4 The principle of irrevocability

Highly fused individuals exhibit unusually stable attachment to the group, and fusion is typically characterized by high temporal stability. The irrevocability principle holds that once an individual is highly fused the combined effect of personal agency, synergistically enhanced identities and enhanced relation ties causes a very limited tendency for de-fusion. Recent studies have shown that degrading both relational and collective ties (i.e., both individual and social identities are dislocated from individual members and the group) can reduce fusion. Conversely, if only either identities are degraded the effect is limited and the level of fusion remains relatively stable (Gómez et al., 2019).

2.2 Targets for fusion

Identity fusion is not restricted to specific group categories but is proposed to be applicable to any situation where an individual interacts with a group (Besta & Kossakowski, 2018; Gómez et al., 2021; Talafar & Swann, 2018), cause (Kunst et al., 2018), entity or another individual (Gómez et al., 2020; Joo & Park, 2017; Kunst et al., 2019; Vázquez et al., 2015).

Interestingly, fusion with an outgroup can occur when sympathies for the groups cause is

prevalent (Kunst et al., 2018) which is indicative of a potential antecedent (i.e., experiences that challenges moral obligations or values) and Buhrmester et al., (2018) has demonstrated that even an animal constitutes a possible entity for fusion. This variation in targets that people can fuse with is reflected in the body of literature included in the present analysis. The extent to which different targets for fusion elicit different outcomes of being fused is not readily established, but according to identity fusion an intergroup conflict is not a prerequisite so any entity that could interact with the personal identity and provide a sense of shared characteristics or reciprocity is principally a plausible target for fusion to develop. The variations in potential entities to become fused with indicates that the antecedents for fusion are diverse.

2.3 Antecedents of identity fusion

The preceding causes of identity fusion was initially proposed to center around shared biology and shared experiences (Gómez et al., 2020). According to this proposition, genetic relatedness is postulated to cause identity fusion and strong pro-group actions as a means of demarcating boundaries between tribal groups. The level of shared characteristics and experiences in both categories was postulated to correlate with levels of identity fusion (Swann et al., 2012). The claim is that genetic relatedness represents relative familial ties and shared experiences facilitates notions of shared essence, which in turn cause fusion with ingroup beyond individuals of close biological relatedness. In line with the predictions by Swann and colleagues (2012), shared biology indeed seems to influence identity fusion. A more recent study demonstrates that fusion is stronger for monozygotic twins compared to dizygotic twins (Vázquez et al., 2017) and consequently the perceived or objective genetic relatedness of group members can plausibly predict the strength and level of fusion (Atran & Gomez, 2018). The aspect of shared experiences, and predominantly experiences of negative or positive valence and high arousal, has been demonstrated to induce identity fusion (Newson et al., 2016). Another study by Whitehouse et al. (2017) showed that shared painful, traumatic, or dysphoric (i.e., unpleasant) experiences promotes identity fusion and by extension extreme pro-group behaviors. In addition, experiences of moral distaste for the treatment of an outgroup can result in fusion with a group to which one does not belong (Gómez et al., 2020; Kunst et al., 2018). The latter example is of interest to the following analytical component of this thesis. During the evolution of the theoretical framework, the

proposed antecedents of identity fusion has increased to include values and convictions (Carnes & Lickel, 2018) and cognitive inflexibility (Zmigrod et al., 2019). Meanwhile, the field is yet to establish a firm set of corroborated precursors of identity fusion.

2.4 Predicting behavior, or just intentions?

The main body of literature on identity fusion is typically addressing the relationship between identity fusion and extreme pro-group behaviors. The nature of what entails behavior and how behavior is measured in the context of identity fusion is worthy of discussion.

Obviously, extreme pro-group behaviors (e.g., terminal sacrifices, dying, killing, and fighting) are difficult to measure. As such, most studies operate with hypothetical proxies for actual behavior. For instance, the most used outcome scale for measuring the relationship between identity fusion and extreme pro-group behaviors is the *willingness to fight and die scale* (Swann et al., 2009). However, this instrument does not measure behaviors at all, but rather the expressed willingness of participants to engage in potentially dangerous acts or even terminal sacrifices on behalf of the entity one is fused with. The hypothetical nature of behavior in this circumstance, especially considering the extremity of the types of behaviors the theory is employed to predict, is arguably not representative for actual behaviors. In addition to the problem with hypothetical proxies for actual behavior, a large portion of the outcome measures are directed towards intentions, beliefs, and other variables of cognitive nature. As such, the claim that identity fusion predicts behavior is arguably overstated, and scales that measure intentions and attitudes, e.g., *willingness to fight and die* (Swann et al., 2009), extreme ideological expressions and political extremism (Simon & Grabow, 2010) are taken into account as behavior. However, some studies indicate that the proposed association between identity fusion and actual extreme pro-group behaviors is ecologically valid. For instance, Libyan frontline fighters were more strongly fused to their military unit, than personnel serving roles in logistic (Whitehouse et al., 2014), which is perhaps indicative of the role of shared valanced experiences as a driver of fusion. In another study, (Gomez et al., 2017) imprisoned Islamic state (ISIS) operatives were found to be highly fused.

Regardless of whether identity fusion predicts actual behaviors, the applied scales does not. Consequently, this paper operationalized the different outcome scales in three superordinate structures that captured the common essence of different scales and grouped them together (e.g., fight and die, collective action, and outgroup hostility). As such, although

the term pro-group behavior proliferates the literature, the analytical section of this thesis refers to pro-group orientations rather than behaviors, since orientations captures the spectrum of potential outcomes represented by the different outcome scales.

The following will give a brief outline of the evident contrasts between identity fusion and social identification. In addition, a brief rundown of the ongoing theoretical debate regarding whether identity fusion should be considered a sovereign theory of group alignment or whether it should be subsumed under the broad social identification paradigm precedes the analytical component of the thesis.

2.5 Theoretical disentanglement and debate over independence

Since the emergence of identity fusion, scholars have debated the theoretical independence of identity fusion from social identification and communal sharing (Babinska & Bilewicz, 2018; Fiske & Rai, 2014; Gómez et al., 2020; Thomsen & Fiske, 2018; Vignoles, 2018). At face value the theoretical differences between identity fusion and social identification are conceptually salient. Identity fusion is concerned with intragroup dynamics and how these processes can foster extreme expressions of group alignment and actions. In contrast, the more readily renown social identity paradigm (Tajfel et al., 1979; Turner & Hogg, 1987) is focused on intergroup relations and how the formations of in- and outgroups drives intergroup conflict and interactions. The theories share many features but represent clearly different points of departure and differs in some important respects that might explain its seemingly greater explanatory and predictive power in terms of extreme pro-group outcomes (Fredman et al., 2015; Gómez & Vazquez, 2015; Gómez et al., 2020; Swann & Buhrmester, 2015 and Whitehouse, 2018).

2.5.1 The role of identities for alignment and motivation

First, the notion of identities is distinctly different. The classical social identity and self-categorization paradigms (Tajfel et al., 1979; Turner & Hogg, 1987) holds that when people engage in pro-group behaviors, they do so not in capacity of their idiosyncratic attributes and individual traits but rather by adopting the group identity while diminishing their personal identity. The social and personal selves are conceptualized to interact minimally, and personal identity is thought to be largely attenuated in the contexts of groups (Turner & Hogg, 1987). By contrast, rather than viewing personal and social selves as

separate features of an individual's identity, the principle of personal agency maintains the independence and salience of personal identity in group contexts (Gómez & Vázquez, 2015a). The social identification approach considers the personal and social selves antagonistic and consequently, the personal identity has a limited contribution in group settings and pro-group behaviors. The individual concedes personal and idiosyncratic traits in favor of the prevalent group identity which serves as a marker for identity and motivation for pro-group agency.

A logical extension of the presence of personal identity in group settings, is that both identities remain simultaneously active. According to identity fusion, the parallel and unattenuated contribution from both identities creates synergies between them and this is in turn proposed to facilitate broader motivational drive that stems from personal agency in tandem with group-based motivational drivers. In addition to the continued contribution from both identities, the identities themselves are conceptualized to be permeable causing highly fused individual to experience a relative overlap of identities, potentially eradicating the borders between personal and social self. This could intuitively explain why a concept that includes both these dimensions of group alignment and motivation yields higher predictive and explanatory potential compared to identification. However, in relation to the predictive power of identity fusion on extreme pro-group outcomes, the power might originate in better scales for capturing the underlying phenomena, rather than theoretical and conceptual superiority. One key challenge to the claim that synergistical and active identities of identity fusion makes it a better theory for explaining group alignment and extreme pro-group orientations is that several updated contributions to social identification (Brewer & Gardner, 1996; Hogg et al., 2017; Leach et al., 2008) include concepts of several identities, some of which are salient in group settings, and are conceptualized to acknowledge and appreciate idiosyncratic features of individual members. Hogg et al. (2017), proposed two new categories of identity which is relevant to this discussion; the first, *Person-based social identity*, refers to acknowledgment of individual group members and their properties as part of their self-concept. The second, the *relational social identity*, entails defining the self in relation to individual people and their unique characteristics and contributions in the group. Insofar as the comparator for identity fusion is classical identification this distinction makes no difference, but in light of more recent conceptualizations, the revised identities could arguably function in the same way as the proposed identity-synergy principle (Hustad, 2021) and the use of older versions of identification would be a lazy comparison.

2.5.2 Individual uniqueness and group prototypes as relational enhancement

As identity fusion posits that group members recognize each other in terms of their individual and unique characteristics as well as the collective features, e.g., such as shared values and experiences, language, or other common and shared markers of social identity that follows from the group membership, their level of mutual recognition is proposed to be deepened. In contrast, social identity holds that recognition of group membership is based on adherence to group standards at the expense of personal identity. As such, fused individuals form collective and relational ties based on personalized recognition of ingroup members in addition to extended ties to those who are considered ingroup by collective features of resemblance and cultural or genetic similarity. In contrast, classical identification precludes this dual pathway to enhanced relational ties, and the ingroup considers each other in a depersonalized and prototypical fashion. In accordance with fusion theory, the goals of the group are serving the agenda of individual members as well to that of the greater group, which is proposed to bolster relatively irrevocable relational ties and motivation for pro-group actions. Similar to the logic that dual and synergistical identities are creating more motivation for pro-group actions, the deepened relational ties posited by identity fusion theory, is not necessarily a valid contrast to social identification. The comparison to older and frankly outdated concepts of how groups acknowledge individual members in social identification deprives the discussion of a better comparison which could be useful in terms of assessing identity fusion in relation social identification.

2.5.3 Theoretical independence?

The extent to which these theories are in fact independent from one another has seen a lot attention in academic circles (Gómez et al., 2020). Some scholars claim that identity fusion should be considered an extreme form of social identification (Babinska & Bilewicz, 2018), or that it is conceptually subsumed under the realm of social identification (Vignoles, 2018), whereas others argue it unique theoretical architecture and ability to capture variance that is not salient from employing social identification scales (Bortolini et al., 2018; Gómez et al., 2020) makes it unique, both conceptually and in applied research. The salient differences and theoretical features of fusion theory makes it a unique concept, at the same time the scales for measuring fusion (Gomez et al., 2011; Jiménez et al., 2015; Swann et al., 2009) and identification (Mael & Ashforth, 1992) typically measures the same with a positive correlations between scales, albeit characterized by a tendency that fusion scales tend to

capture more of the variance (Bortolini et al., 2018; Gómez et al., 2020). Regardless, the question remains whether this alleged difference in correlation with extreme pro-group outcomes is enough to theoretically discriminate between frameworks.

2.6 Previous work and motives for the meta-analysis

With this theoretical discussion as a backdrop, a previous literature review (Hustad, 2021) assessed the relative independence, and predictive and explanatory power of the different frameworks. At the time, a comprehensive systematic review on the field was missing and the results raised several questions as well as tentative answers. First, in line with the general findings in the field, the results from a limited subset of studies showed that identity fusion was a stronger predictor for extreme pro-group outcomes than social identification. Second, as constructs the theories entail opposing conceptions of the roles of different identities (i.e., personal self and social self) and the impact and function of personal identity in group settings. Third, fusion could be described as a theory with a clear prospect for application, whereas identification has a much broader area of application and less theoretical clarity. Meanwhile, these observations are arguably sensitive to different measures for both fusion and identification, which version of social identification one adopts as comparator to fusion and the extent to which different concepts of group alignment and pro-group action in fact taps the same underlying phenomena (Hustad, 2021)(Hustad, 2021).

Generally, the findings indicated that identity fusion arguably should be regarded an independent theory, despite apparent uncertainties related to theoretical ambiguities and statistical sensitivities. In the field of scholars, a recent review by Gómez and colleagues (2020) shows that across a broad range of interdisciplinary studies in different cultures and contexts, identity fusion has demonstrated seemingly greater explanatory and predictive power in terms of extreme pro-group outcomes. Moreover, in a recent systematic review, identity fusion was found to be the strongest predictor of radical intentions among tens of alternative variables (Wolfowicz et al., 2021). Meanwhile, even if identity fusion represents a conceptually different paradigm from social identification there are still many questions and areas that warrants sustained attention before a robust conclusion regarding its theoretical independence can be met. Furthermore, the apparent predictive value of identity fusion is difficult to assess due to several influencing factors. First, the effect size of identity fusion is typically estimated on several studies from individual papers which could lead to

interdependence of primary effects, and different studies from various settings with different points of departure which could yield high heterogeneity of results and potential problems with generalizability across studies. Second, even though the body of research on identity fusion is undertaken on all continents, most studies is thus far restricted to mainly Spanish and US participants (albeit with an increasingly greater distribution from other countries over time) leaving many open questions regarding cultural and demographic dynamics of identity fusion and third, the different applied measurements for both identity fusion and social identification as well as extreme pro-group outcomes could influence the results. For instance, to some extent the potentially superior predictive validity is considered proof that identity fusion is an independent theory, however it is equally plausible it could be ascribed to comparatively stronger reliability of identity fusion scales, rather than theoretical independence and superiority in predicting pro-group outcomes. To resolve some of these issues a meta-analysis could be beneficial.

Despite researchers having published productively on the role of identity fusion for more than a decade, a meta-analysis is missing. A meta-analysis facilitates robust estimates of effect size across studies and increases the generalizability of the results of individual studies. Considering the varied application of identity fusion and the heterogeneity of its effects, this approach is beneficial to investigate the gravity of the paradigm across different contexts and applied settings. This following presents a comprehensive meta-analysis aiming to estimate the effect of identity fusion on extreme pro-group orientations across the available research. Importantly, the aim is to answer a set of questions that are central to the theory by focusing on the influence of various moderating factors. Specifically, whether identity fusion predicts extreme pro-group outcomes beyond mere social identification, whether the effect of identity fusion depends on which country people live in and sample demographics, what type of group they fuse with, how identity fusion is measured, and how extreme pro-group outcomes are assessed.

3 Identity Fusion and Extreme Pro-Group Outcomes: Remaining Questions

Research suggests that identity fusion predicts extreme pro-group outcomes in a variety of contexts. For instance, among many related studies Gómez et al., (2016) found that national

sentiments and fusion with home country is strongly associated with willingness to engage in extreme acts on behalf of the country. In similar studies (Gómez et al., 2016; Swann & Buhrmester, 2015) fusion with country was moderately to strongly associated with endorsement of extreme acts on behalf of the country, albeit with significant differences between countries ($r=.32 - .61$). Several studies on fusion with a political cause or political leaders show that a high level of fusion predicts political extremism and influence the willingness to censure opposing views and persecute political opposition (Ashokkumar et al., 2020; Besta et al., 2015; Kunst et al., 2019). Bortolini et al. (2018) demonstrated that fusion with a football club promotes willingness to engage in extreme pro-group activities similar to that of fusion with a religious group or country. Sport contexts as drivers of national sentiments and subsequently identity fusion is demonstrated by Michael D. Buhrmester et al. (2018), and Fredman et al. (2017) showed that fusion with Judaism predicts willingness and desire retaliate in religiously motivated conflicts in Israel. Among various other studies in many different contexts, the available body of research on identity fusion indicates its applicability in various settings. However, despite the relatively high and seemingly good predictive value of identity fusion, the variability in settings constitutes a potential problem in terms of generalizability across studies. This is mainly due to high number of studies that stem from individual papers and the relatively low number of studies undertaken in many of the domains represented in the literature. Furthermore, fusion is typically measured on three different instruments, the verbal scale (ref), the pictorial item (ref) or the dynamic scale (ref), which are represented unevenly in the literature and consequently the correlations are likely to fluctuate significantly between scales, depending on the number of times it has been employed (with stronger associations for the mostly used scale(s)). In addition, the high number of different instruments that are applied to measure the outcomes of fusion can significantly impact the reported effects. In previous reviews (Gómez et al., 2020; Hustad, 2021), assessments of the field indicate that identity fusion can seemingly capture more of the variance in terms of group alignment and pro-group outcomes. However, a systematic meta-analysis of the available research is missing to date. Such an analysis is crucial as it can answer important remaining questions.

First, given the relatively high variance in reported results, it is important to establish the overall effect of identity fusion across studies. Second, a meta-analysis can provide a robust test of the relative influence of identity fusion as compared to social identification and establish whether identity fusion exhibits greater explanatory and predictive power in terms

of extreme pro-group behaviors – an issue that has been discussed since the emergence of the field of identity fusion (Gómez et al., 2020). Third, although the role of identity fusion has been tested in a variety of contexts including countries from five continents (Swann & Buhrmester et al., 2014), whether effects are stronger for some countries than others has not been systematically examined to date. In addition to the potential moderating effect of age and gender, the degree to which different cultural contexts (i.e., conceptualized at the levels of countries) cause dynamics that influence the effect of fusion on relevant outcomes would be informative to establish. Fourth, fusion has been tested in relation to many qualitatively different groups such as national (Bortolini et al., 2018; Swann & Buhrmester, 2015), religious (Besta et al., 2014; Fredman et al., 2017; Gómez et al., 2021), political (Besta et al., 2015; Buhrmester et al., 2012; Kunst et al., 2019), familial (Vázquez et al., 2015), sports supporters (Kossakowski & Besta, 2018; Newson, 2017; Newson et al., 2018), gender (Gómez et al., 2019), and even outgroups (Kunst et al., 2018). Yet, whether its predictive power differs depending on the group in question has not been systematically investigated. As such, we do not know whether the effects of identity fusion may be more pronounced for some groups than for others. Fifth, most studies have reported effects of identity fusion as measured by one of three common instruments, specifically, the pictorial (Swann et al., 2009), the verbal (Gomez et al., 2011), and the dynamic (Jiménez et al., 2015) scales. Relatedly, identity fusion researchers have used a variety of measures to assess different types of extreme pro-group outcomes. A systematic analysis of these studies can help establish whether the relationship between identity fusion and extreme pro-group outcomes generalizes across identity fusion measurement scales and beyond specific types of extreme pro-group outcomes. Finally, a meta-analysis can offer insights into the extent to which publication bias may underly the observed effects. In the present paper, the aim is to address these issues by meta-analyzing 57 studies with 36,880 participants, including 106 reported associations between identity fusion and extreme pro-group outcomes.

4 Methods

4.1 Inclusion Criteria

This meta-analysis included published and unpublished studies that reported a statistic (e.g., correlation coefficient, beta estimate or odds ratio) reflecting the degree of fusion with a group and at least one measure of extreme pro-group orientations. Since its conception (Swann et al, 2009), recent approaches have seen the extension of fusion with a group or a

human to other targets of fusion (e.g., a brand, a value, and even an animal). However, most papers to date have investigated the effects of being fused with human targets. To investigate the association between fusion and pro-group outcomes, this meta-analysis focused on fusion with groups and individuals.

Extreme pro-group orientations were defined to encompass intentions, behavior, and attitudinal support for extreme pro-group acts (e.g., willingness to fight, die and sacrifice, political extremism, extreme activism, extreme protest behaviors, or extreme support behaviors). To optimize the selection and coding process, a substantial effort was undertaken to ensure that raters had a common understanding of this working definition. For instance, we mapped words and concepts (e.g., violence, violent intentions, support for violence, extremist attitudes, extreme political viewpoints, extreme support behaviors) in associative networks, prior to the study selection process.

4.2 Search Procedure

The search for relevant literature followed the PRISMA 2020 guidelines (Page et al., 2021), and was conducted in PsycInfo, Scopus and Web of Science, in January 2020. The search covered the 2009-2020 timeframe to account for the entire body of literature since the first manuscript of identity fusion was published (Swann et al., 2009). It was structured to capture a broad variety of extreme pro-group outcomes in line with the operationalized definitions of relevant behaviors and attitudes (see Figure 1). The same search string was used for all three databases respectively: (Identity fusion) AND (extrem* OR violen* OR political OR sacrifice OR pro-group). Subsequent steps of literature screening and data structuring were conducted utilizing Cadima, an online synthesis tool for systematic reviews (Kohl et al., 2018). Cadima allows for automatic exclusion of duplicates. Available unique records were screened at title, abstract and full-text level by the first author and a research assistant. Screening was carried out by two individuals to allow calculation of interrater reliability. This is crucial for ensuring the quality and accuracy of both screening and coding procedures (McHugh, 2012). Interrater reliability was assessed with Cohen's kappa (κ) which is the most commonly used statistic for testing interrater reliability and calculated as following:

$$\kappa = \frac{p_o - p_e}{1 - p_e}$$

where p_o is the relative observed agreement between raters, and p_e is the probability of chance agreement. Hence, Cohen's κ takes into account that two raters may agree on some items by chance (McHugh, 2012). Cohen's κ ranges from -1 to 1 where 0 indicates agreement at the level of random chance and is a standardized statistic enabling direct comparison across studies. In standard interpretations of Cohen's κ , agreement is considered *moderate* when $0.41 < \kappa < 0.60$, *substantial* when $0.61 < \kappa < 0.80$, and *perfect* when $0.81 < \kappa < 1$ (McHugh, 2012).

For article screening, the interrater agreement was excellent (Cohen's $\kappa = .82$) for title and abstract inclusion, and both raters were in perfect agreement (Cohen's $\kappa = 1$) on the inclusion of eligible records for further analysis. In parallel with the database search, a call for unpublished data was sent out via the list-servers and forum of the Society for Personality and Social Psychology. The call resulted in 30 additional studies being included in the analysis. The screening and selection process of unpublished material was performed by the first and a research assistant based on the same operationalized criteria for extreme pro-group outcomes and agreement was perfect (Cohen's $\kappa = 1$).

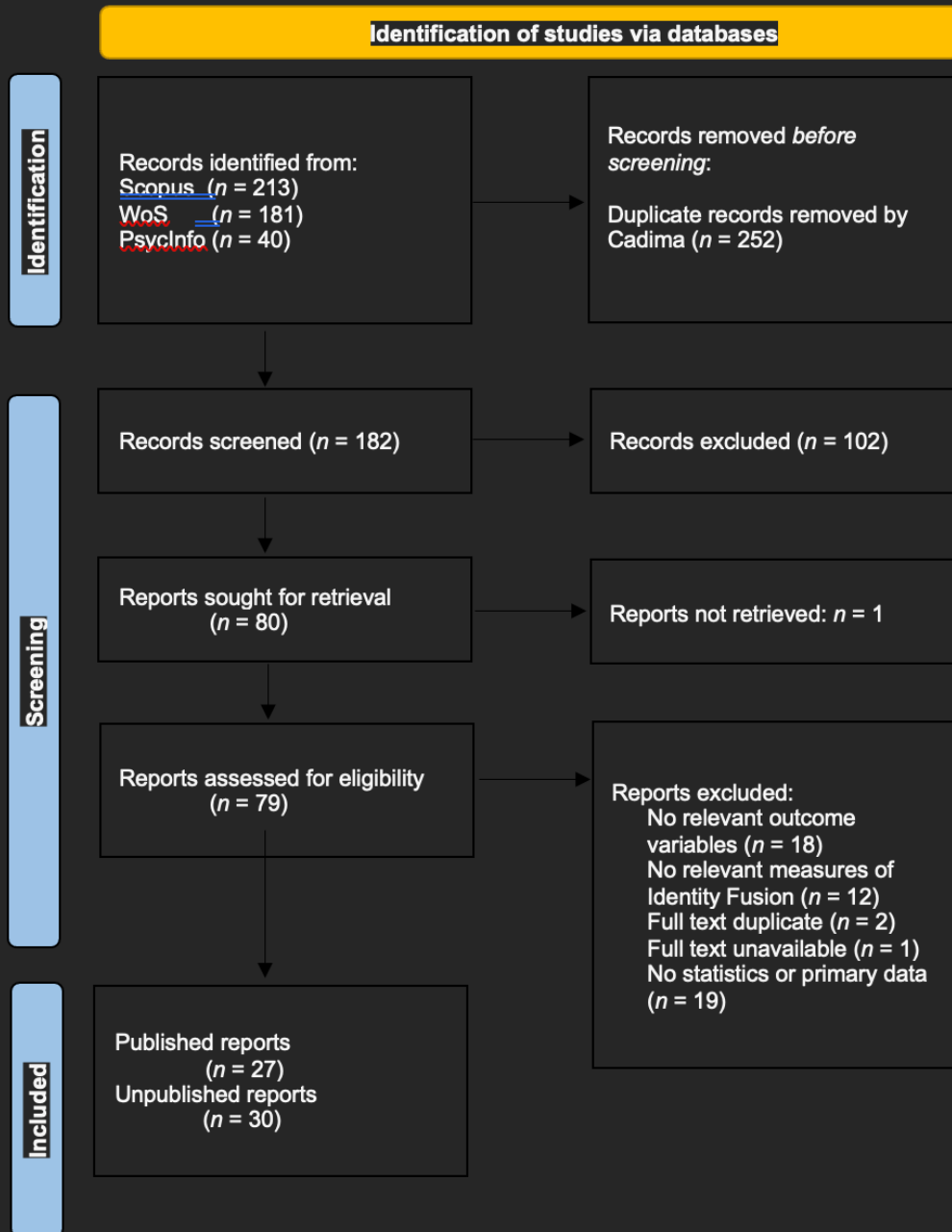
4.3 Coding procedure

Data from the included records were extracted by the author and an assistant. To ensure the consistent and reliable extraction of data, the entire dataset was coded twice. As such, a complete overlap between the coders was realized. The process resulted in very little discrepancies between the coding schemes (Cohen's $\kappa = .87$). Discrepancies were revisited and recoded separately to ensure consistency.

The following information was extracted from each paper: year of publication, country, sample size, gender and age distribution in the participant sample, identity fusion measurement scale, social identification measurement scale, extreme pro-group outcomes measurement scale, and number of items of each scale. Correlation coefficients between identity fusion and extreme pro-group outcomes, and social identification and extreme pro-group outcomes, were extracted whenever available ($n=70$). When correlation coefficients were not reported and raw data was not provided or available, correlation coefficients were approximated using the method described in Borenstein et al. (2009) for effects reported as odds-ratios ($n=15$) and the formula of Peterson and Brown (2005) for effects reported as

Figure 1

PRISMA Flow-Chart



regression coefficients ($n=21$). The Borenstein (2009) method provides formulas to calculate the standardized mean difference (Cohen's d) from the odds-ratio, and then calculate the correlation estimate, r , from Cohen's d . Peterson and Brown (2005) provide evidence that correlation estimates, r , can be estimated from beta coefficients with the formula:

$$r = \beta + (0.05 * \lambda)$$

where $\lambda = 0$ if $\beta < 0$ and $\lambda = 1$ if $\beta > 0$. To assess whether the conversion of estimates induced bias in the estimated averaged effect size, a sensitivity analysis was conducted regressing the effect size on the type of effect measure (correlation coefficient, odds-ratio, or regression coefficient). Results indicated no significant difference in the size of effects estimated from correlation coefficients and converted odds-ratios, $B = .06$, 95% CI [-.05, .17], or regression coefficients, $B = -.05$, 95% CI [-.12, .02].

4.4 Sample Descriptives

The final pool of studies comprised of 57 studies, including 106 relevant effect sizes from 36,880 participants. An overview of all included articles and their descriptives can be found in Appendix, Table 1, and the full dataset and R code is available via [OSF](#). The average sample size was 347.90 ($SD = 377.00$), and the mean participant age was 33.38 ($SD = 5.73$). On average, 46.45% of the participants were male. The primary studies originated from 9 different countries, with the greatest number conducted in Spain ($k = 64$) and the United States ($k = 21$). All included studies were cross-sectional.

4.5 Measures

The final sample of included articles comprised three different scales to measure identity fusion; the verbal scale (Gómez et al., 2011) ($n=86$), the pictorial scale (Swann et al., 2009) ($n=14$), and the dynamic scale (Jiménez et al., 2015) ($n=6$). Social identification was measured with the organizational identification index (Mael and Ashforth, 1992), with only a few exceptions. All measurement instruments discussed here can be found in Appendix (Table 2, Figure 1, Figure 2).

4.5.1 The verbal scale

The verbal scale is a 7-item self-report measure developed to tap the two core properties of identity fusion; perception of connectedness with the group and reciprocal strength (Appendix, Table 2). Respondents judge the extent to which items like “*I feel immersed with my country*” and “*I am strong because of my country*” reflect their experienced relationship with the target of interest (originally developed for fusion with *country*) on a 6-point Likert scale ranging from 0 (strongly disagree) to 6 (strongly agree). Gómez and colleagues (2011) reported a test-retest reliability over a 6-month period of $r=.71$. Further, Cronbach’s alpha, which measures internal scale consistency was high at both time points ($\alpha=.82$, and $\alpha=.87$, respectively).

4.5.2 The pictorial scale

The pictorial scale asks individuals to select which one of 5 pictures best reflect their relationship with the group of interest (Appendix, Figure 1). The pictures represent two circles, one large (the group) and one smaller (the self) with five degrees of symmetrical overlap (0%, 25%, 50%, 75% and 100%). Swann and colleagues (2009) reported no measures of test-retest reliability.

4.5.3 The dynamic identity fusion index

The dynamic scale is an extension of the pictorial scale, developed to combine the simplicity of the pictorial scale and the higher predictive validity of the verbal scale (Jiménez et al., 2015) (Appendix, Figure 2). On a screen a large circle (marked with the group of interest) and a smaller circle (marked with “me”) are presented, and respondents are asked to move the “me” circle to the position that best reflect their relationship with the group. When the two circles overlap, their colors blend to enhance the visual analogy of fusion. The level of fusion is operationalized as a combination of two measures from participant responses; overlap and distance. Overlap is calculated as the percentage of the small circle that overlaps with the larger circle, while distance is calculated as the number of pixels that separate the center of the two circles. Hence, even when overlap is 100% distance can vary reflecting how close to the center of the large circle the smaller circle is positioned. Jiménez and colleagues (2015) reported a test-retest reliability over a 3-month period of $r=.87$.

4.5.4 Organizational identification index

The organizational identification index (OID) (Mael and Ashfort, 1992) was developed by Mael and Ashforth to capture social identification in the context of organizational affiliation. It consists of 6 items representing a statement, and individuals are to respond how well that statement describes themselves, rated on a 5-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). It is a development of previous organization identification scales, but designed to better capture the perceptual and cognitive construct of identification (Mael & Ashforth, 1992), i.e., the extent to which individuals experience themselves as psychologically intertwined with the fate of the group. In contrast to previous identification instruments, the OID discards behavior and affect as merely potential antecedents and further aim distinguishes social identification from professional and occupational identification (Mael & Tetrick, 1992). Studies have reported an internal consistency of $\alpha = .81-.83$ (Ashforth & Mael, 1989; Mael, 1988).

4.6 Analytic Procedures

The analysis was performed using robust variance estimation (RVE; Hedges et al., 2010) in the R package *robumeta* v.2.0 (Fisher & Tipton, 2015; R version 4.6).

RVE has proven to accurately estimate averaged effect sizes even when primary effects are correlated and the amount of correlation is unknown (Fisher & Tipton, 2015; Fisher et al., 2017). Most traditional meta-analytic methods are not well suited to handle correlations between primary effects, as they assume complete independence between effect sizes (Moeyaert et al., 2017). However, this is very rarely the case. Many studies included in meta-analyses typically report multiple effect sizes which are derived from the same population, inducing correlation between them. Further, even if all included effect sizes are measured on different populations, results may still be correlated when a hierarchical relationship exists between the included effect sizes, for instance if they based on the same measurement instruments, conducted in the same labs, or variables are operationalized in a similar manner. Hence, the sampling error within the effects sizes will tend to be dependent (Moeyaert et al., 2017). Meta-analytic methods calculate averaged effects based on the covariance matrix of the individual primary effect sizes, and since covariance are merely scaled correlations, the results will be invalid if the correlation among primary effects are unaccounted for (Fisher &

Tipton, 2015; Fisher et al., 2017). RVE is a recently developed meta-analytic approach that effectively deals with dependency between effect sizes. Rather than estimating the sampling variance of the mean effect from the exact within-study covariance matrix of estimation errors (which would require exact correlation estimates), RVE calculates the cross products of within-study residuals as an approximation for the covariance matrix. Hedges and colleagues (2010) conducted a series of simulation studies showing that this approximation produces highly valid results that are unbiased and uninfluenced by the dependency between studies. Further, while the approximation becomes more accurate as sample size increases (Moeyart et al., 2017), they showed that RVE produce robust estimates with as few as 20-40 studies. Hence, accurate estimates of the underlying population, standard errors, point estimates and confidence intervals can be obtained without specifying the exact nature of dependence between primary effect sizes (Park & Beretvas, 2019).

Meta-analytic methods are based on standardized effect sizes so as to make effects from different studies comparable. The present analysis transformed all effect sizes (Pearson correlations, r) transformed to Fisher's z for standardization, which allows calculation of confidence intervals for the correlation coefficients. This transformation normalizes effect sizes so that the sampling distribution approximates a normal distribution, which is assumed the RVE method (Carbonell et al., 2009). Fisher's z -scores were calculated with the *escalc* function of the *robumeta* R package. Model coefficients and confidence intervals were transformed back to r estimates for reporting, using the formula:

$$r = \frac{\exp(2 * \beta) - 1}{\exp(2 * \beta) + 1}$$

where β is the beta coefficient, the lower confidence interval and the upper confidence interval (calculated separately).

Six meta-regression random-effects RVE models were estimated. One assessed the overall averaged effect of identity fusion on extreme pro-group behavior. Five tested potential moderating effects on this relationship. Distributions of all moderator variables can be found in Appendix (Figure 3 to 10).

4.6.1 Model 1: Intercept model

An intercept model estimates the average effect size across studies. If the intercept model is different from zero, this indicates that the averaged effect size is unlikely to be zero i.e., we can robustly interpret that there is a relationship between identity fusion and extreme pro-group orientations. A forest plot visualizing the estimated effect sizes across studies can be found in Appendix (Figure 11).

4.6.2 Model 2: Effects of identity fusion versus social identification

It is an ongoing debate in the literature on social identity and extreme pro-group behaviors, whether propensity to commit such extreme types of behavior are better explained by the theory of identity fusion or social identification. Model 2 tested whether the effects of identity fusion versus social identification on extreme pro-group orientations differed in strength of. This model was fitted on the subset of studies ($k = 32$), including only those studies reporting both measures of identity fusion and group identification, to eliminate any sample-specific effects. A dummy variable was coded as 0 for social identification effects and 1 for identity fusion effects, yielding two estimates from each study. Author was included as a random effect, allowing each study to have different intercepts. This procedure then takes into account that some of the relationship between estimates may arise from them coming from the same study. If the two measures do not differ in their relationship with extreme pro-group outcomes, we would expect no significant difference between their effect sizes.

4.6.3 Model 3: Effect of country

While the vast majority of studies in the identity fusion literature have been conducted in Spain, the articles included in the current meta-analysis comprised studies from 9 different countries. This enables investigations as to whether effects of identity fusion generalize across countries or whether there are culture-specific elements moderating the relationship with extreme pro-group orientations. Model 3 assessed whether effect sizes of identity fusion differed systematically between countries including country of data collection

as a categorical moderator. Spain was coded to be the intercept yielding estimated model coefficients that reflect the extent to which averaged effects from each of the remaining countries differed significantly from those from Spain. If there are no significant differences between the averaged effects between countries, this indicate that the relationship between identity fusion and extreme pro-group orientations generalizes well across cultures and hence are little influenced by potential culture-specific features.

4.6.4 Model 4: Effect of gender and age distributions

While the current sample of articles does not enable investigations of differences between males and females directly, it remains important to systematically assess whether studies with larger proportions of males versus females generally yield stronger effects of identity fusion and vice versa. If a true difference in the effect between males and females indeed exists, it would be expected that studies with larger proportions of males or females exhibit differences in the averaged effects. Similarly, if a true effect of age manifest on propensity to fuse with a group and endorse in extreme behavior, it would be expected that studies with studies with larger mean age would differ systematically from studies with smaller mean age. Model 4 tested if the proportion of males in the sample (in %) and mean age of the sample moderated the size of effect.

4.6.5 Model 5: Effect of fusion target group

Identity fusion have been applied to explain extreme pro-group orientations in a wide range of group contexts, which may explain some of the variance in reported estimates, as some types of groups may in themselves endorse stronger tendencies of fusion or extreme behavior, than others. Conversely, if no systematic differences manifest in the effect sizes of identity fusion across target groups, this would indicate that identity fusion generally provide

a strong account for extreme pro-group orientations regardless across contexts, and hence indeed capture general psychological self-group dynamics rather than group-specific behaviors or expectations (e.g., inherent features of nationalism or hooliganism). Model 5 addressed differences in the effect of identity fusion on extreme pro-group orientations between different group contexts by including fusion target group (country, kinship, religious groups, political groups, outgroup, or other groups) as a categorical moderator.

4.6.6 Model 6: Effect of measurement scales

Lastly, a notable issue in the identity fusion literature is discrepancies in how the degree of fusion is measured. While three measurement scales are widely applied and accepted it remains unclear the extent to which results are dependent on the specific scale used and how robust each individual scale is across studies. Further, identity fusion has been employed to predict a wide range of extreme pro-group behaviors, attitudes, and orientations, which generally supports the wide applicability of identity fusion as a theory, however, it remains to be addressed systematically whether specific types of extreme pro-group outcomes are more or less related to identity fusion. Model 6 tested if the specific scales used to measure (a) identity fusion and (b) extreme pro-group orientations influenced the size of the meta-analytical effect by including two categorical moderators: type of identity fusion scale (verbal, pictorial and dynamic) and type of measure of extreme pro-group outcomes. Since most extreme pro-group outcome scales were represented in only a few studies, these were grouped into three categories according to the type of outcome measurement; *Fight/Sacrifice* (Chinchilla et al. (unpublished); Foot, 1967; Atran et al., 2014; Swann et al., 2009; Swann et al., 2010; Sheikh et al., 2016), *Collective action* (Gómez et al., 2011; Zomeran et al., 2014; Simon et al., 2010) and *Outgroup hostility* (Silver and Brewer, 1997; Besta et al., 2014; Altemeyer, 1996). The model intercept was coded to represent the two most commonly used scales; the verbal identity fusion scale (Gómez et al., 2011) and the *Fight/Sacrifice* outcome scales. Model coefficients thus represent the difference in averaged effects for studies using each of the remaining scales compared to the averaged effect of studies using the two intercept scales.

4.6.7 Publication bias

Publication bias induces a significant validity-threat to the field of psychology and other social sciences (Hunter & Schmidt, 2004) and particularly to meta-analytic results. When findings are reported selectively to be positive and significant (even just a portion of them) it causes estimated averaged effects to be greatly exaggerated (Stanley, 2017). Similar effects are induced by p-hacking and sample bias causing reported effects to be greater than true effect size (Stanley, 2017). Further, studies included in meta-analyses may exhibit large heterogeneity caused by effects of socioeconomic status, culture, gender, age, etc., or by variations in the measurement instruments or reliability, as is the case of the present meta-analysis. To account for publication bias or other systematic causes of heterogeneity, a precision-effect estimate with standard errors (PET-PEESE) analysis was conducted in a sample-size-based variant (Pustejovsky & Rodgers, 2019). This regression-based method has proven superior to other conventional meta-analytic methods in identifying and reducing publication bias (Stanley, 2017) PET-PEESE consists of two meta-regression models (PET regression and PEESE regression) where the meta-analytical effect is regressed on a transformation of the sample size. The resulting intercept indicates the unbiased effect size, while the regression coefficient refers to the bias. If the intercept of the PET model is significant at $\alpha = .10$ PEESE model results are interpreted; otherwise, PET model results are interpreted (Pustejovsky & Rodgers, 2019).

4.6.8 Assessment of heterogeneity

As mentioned, heterogeneity in reported effect sizes can be caused by random sampling errors or it can reflect true variation in the studies samples. Identifying the amount of each type of contributors to heterogeneity in a meta-analysis is crucial in order to interpret whether the effect of interest indeed exhibit robust results across studies. If the effect sizes included in the present analysis exhibit high heterogeneity and a significant proportion of this is caused by true variation, then this indicates that effects of identity fusion generally vary a lot between studies and cannot be predicted reliably (von Hippel, 2015). Contrary, if most of the heterogeneity is caused by sampling variance then we can interpret the estimated averaged effects more confidently as a “true” effect of identity fusion. The current analysis implemented the statistic I^2 is implemented as a measure of how much of the total variance in study estimates is due to heterogeneity and sample variation (Higgins & Thompson, 2002).

The I^2 metric ranges from 0 to 1 indicating the proportion of heterogeneity (I^2) and sampling variation ($1-I^2$) (von Hippel, 2015).

5 Results

5.1 Model 1: Averaged effect of identity fusion on extreme pro-group orientations

Model 1 tested the overall association between identity fusion and extreme pro-group orientations when no moderators are accounted for. Results showed a strong averaged correlation across studies of $r = 0.49$ (see Table 1, Model 1). Yet, the I^2 indicated that over 90% of variation of the primary effects included in this analysis was due to true variation rather than sampling error, highlighting the need for meta-regressions to address potential moderating factors contributing to this variability.

Table 1

Results of Robust Variance Estimation Meta-Analyses

Model	Variable	<i>k</i> effects	<i>k</i> studies	Estimate	95 % CI-L	95 % CI-U	<i>dfs</i>	I^2	τ^2
Model 1: Main effect							90.51	0.03	
	Intercept (Identity fusion)	106	61	.485	.453	.516	105		
Model 2: Construct type							30	89.86	0.03
	Intercept (Social identification)	32	20	.363	.291	.430			
	Identity fusion***	32	20	.141	.092	.189			
Model 3: Country							97	89.65	0.03
	Intercept (Spain)	64	42	.474	.433	.513			
	Brazil	4	2	-.070	-.167	.027			
	China	1	1	-.018	-.070	.022			

Italy***	3	3	.402	.325	.473			
Norway	1	1	-.005	-.057	.046			
Poland	7	4	.134	-.084	.341			
UK***	1	1	-.327	-.372	-.280			
US	21	8	.015	-.099	.128			
Worldwide	4	2	-.027	-.178	.125			
<hr/>								
Model 4: Sociodemographics						98	90.18	0.03
Intercept			.758	.601	.860			
Male (%)	103	60	-.001	-.003	.001			
Age***	101	59	-.012	-.020	-.005			
<hr/>								
Model 5: Target group						99	91.06	0.03
Intercept (National group)	77	50	.467	.430	.503			
Kinship	2	1	-.050	-.188	.091			
Other groups	10	7	.034	-.118	.184			
Outgroup**	10	6	.195	.030	.350			
Political group	4	1	-.046	-.112	.021			
Religious group	2	2	.211	-.272	.610			
<hr/>								
Model 6: Measure type ¹						95	90.15	0.03
Intercept (Identity fusion, verbal; Fight/Sacrifice)	172	17	.505	.463	.545			
Identity fusion scales:								
Dynamic Identity Fusion Index (DIFI) ***	6	6	-.274	-.402	-.136			

Pictorial scale**	14	5	-.124	-.234	-.010
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Extreme pro-group outcome scales:

Collective action**	7	4	.159	.014	.298
Outgroup hostility	7	2	-.085	-.186	.018

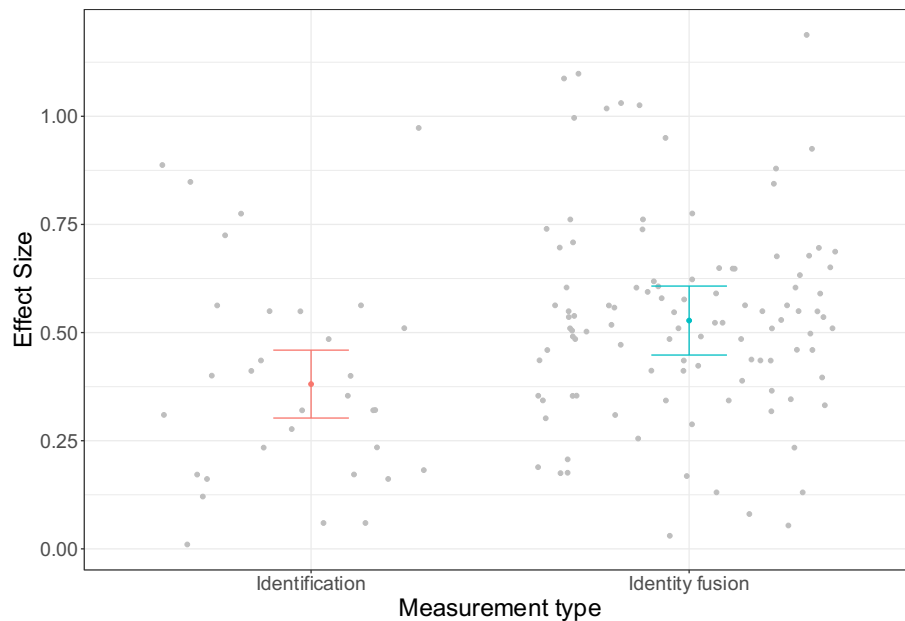
Note. Model 1 refers to the main effect of identity fusion on outcomes, whereas Model 2 – 6 refer to meta-regression models with moderators. Names in parentheses next to intercept indicate what category was used as baseline in the specific meta-regression. Estimate refers to regression coefficients, whereas selected meta-analytical effect sizes obtained for specific categories (e.g., a specific country) are provided in the text. * $p < .05$, ** $p < .01$, *** $p < .001$.

5.2 Model 2: Difference between effects of identity fusion and social identification

Model 2 tested the difference between effects of identity fusion and social identification on extreme pro-group orientations using a dummy moderator of type of estimate (fusion versus identification) on effect sizes. Results indicated a significant difference (see Table 1, Model 2), where identity fusion on average exhibited a stronger association with extreme pro-group outcomes, $r = .50$, 95% CI [.42, .54], $I^2 = 89.54$, than did social identification, $r = .36$, 95% CI [.29, .43], $I^2 = 90.16$ (see Figure 2). Again, the associated I^2 statistics for both models indicated a notably high heterogeneity in effect sizes.

Figure 2

Estimated Effects of Social Identification and Identity Fusion on Extreme Pro-group Outcomes



Note. Model 2 estimated effects by identity fusion or identification scales. Error bars represent 95% Confidence Intervals. Grey points represent individual effects. All values refer to Fisher's Z-transformed correlations. As the z-scores were used for visualization, minor differences between these estimates and the model results reported in Table 1 are expected.

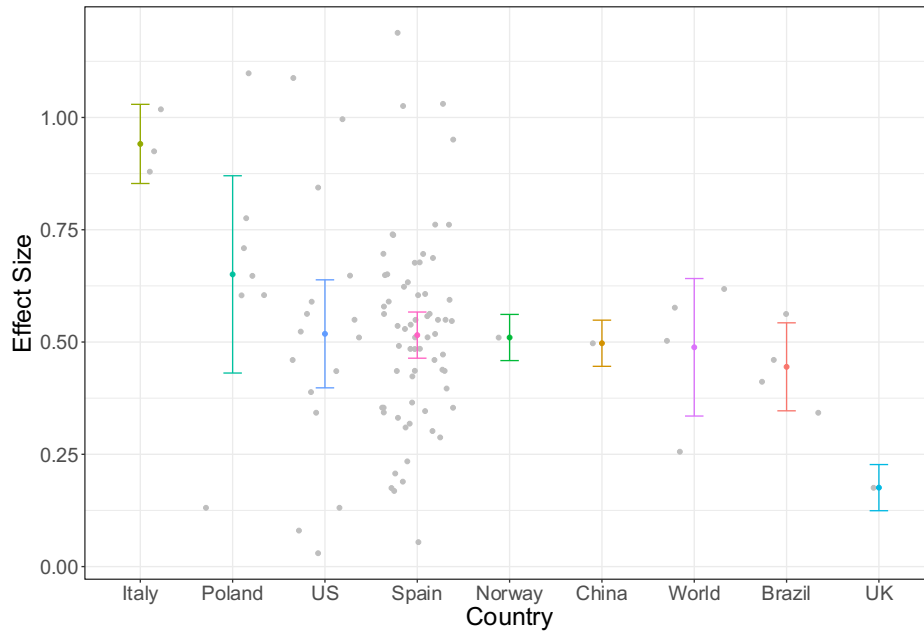
5.3 Model 3: Effect of country

Model 3 addressed the effect of country of data collection on reported effect sizes (Table 1, Model 3). Results showed significant differences in effect sizes between countries (Figure 3). Specifically, compared to Spain (intercept), $r = .47$, 95% CI [.43, .51], $I^2 = 90.08$, $k_{effects} = 64$, the association between identity fusion and extreme pro-group orientations was significantly stronger in Italy, $r = .74$, 95% CI [.63, .81], $I^2 = 0.00$, $k_{effects} = 3$, and significantly weaker in the UK, $r = .17$, $k_{effects} = 1$. However, as these countries were represented by a small number of studies, results should be interpreted with caution. Note that I^2 for studies conducted in Italy indicates no heterogeneity, which, compared to the remaining high heterogeneity in studies conducted within Spain, suggest that this is more likely to be due to the low number of observations rather than reflecting the true level of heterogeneity. Model 3

thus further indicate, that even when accounting for variation caused by *country* reported effect sizes still exhibit considerable heterogeneity.

Figure 3

Estimated Effect Size by Country



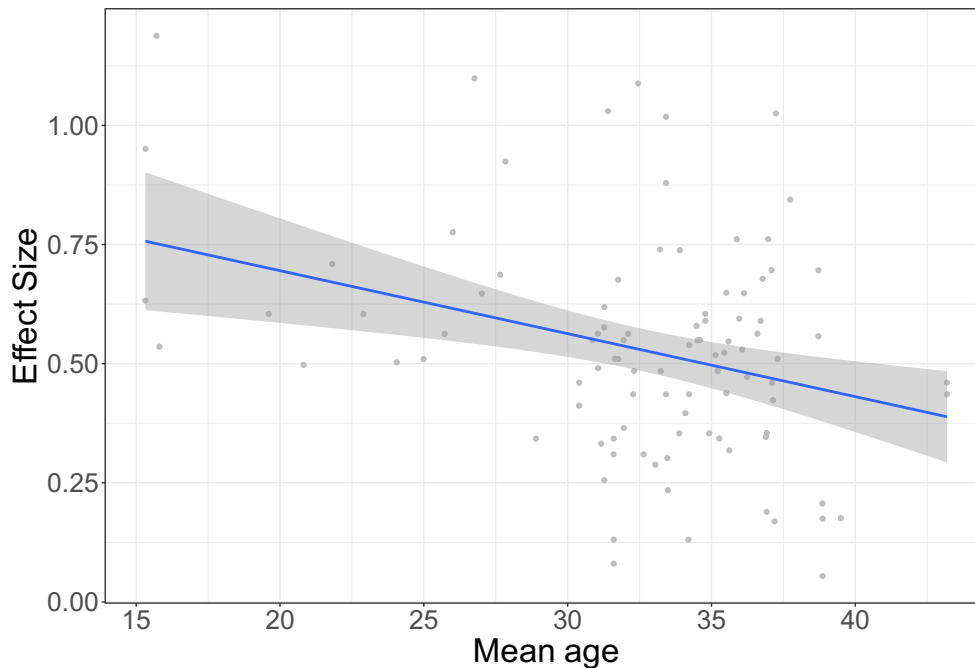
Note. Model 3 estimated effects by country with 95% CI error bars (colored) and observed effects (grey). All values refer to Fisher’s Z-transformed correlations. As the z-scores were used for visualization, minor differences between these estimates and the model results reported in Table 1 are expected.

5.4 Model 4: Effect of gender and age distributions

Model 4 assessed the moderating effect of mean age and gender on the correlation between identity fusion and extreme pro-group orientations. Results indicated a significant negative effect of age, $\beta = -.012$, 95% CI $[-.020, -.005]$, $p < .001$, suggesting that the effect of identity fusion on extreme pro-group orientations decreased as the mean age of the sample increased (see Figure 4). No effect of gender distribution (% male) on the effect sizes of identity fusion was observed, $\beta = -.001$, 95% CI $[-.003, .001]$, $p > .05$. Model 4 exhibited an I^2 statistic of 90.18 indicating that heterogeneity in effect sizes remains considerably high and cannot be accounted for by demographic variation in study samples.

Figure 4

Estimated Effect Size by Mean Age



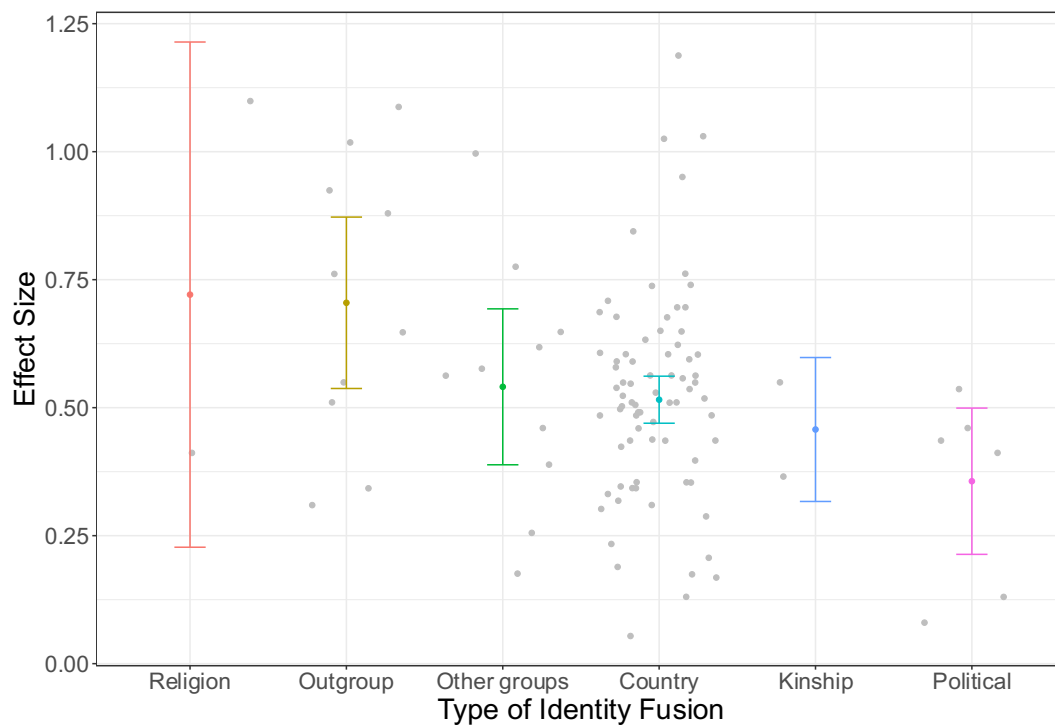
Note. Model 4 estimated effect of mean age with effect slope (blue) and 95% CIs (ribbons). Dot points represent observed effects (grey). All values refer to Fisher’s Z-transformed correlations. As the z-scores were used for visualization, minor differences between these estimates and the model results reported in Table 1 are expected.

5.5 Model 5: Effect of fusion target group

Model 5 tested if the effects sizes varied with the target group of identity fusion (e.g., national group, religious group) (see Table 1, Model 5, and figure 5). Results indicated that the relationship between fusion and extreme pro-group orientations was significantly stronger when fusion was measured with respect to an outgroup, $r = .61$, 95% CI [.47, .71], $I^2 = 88.15$, $k_{effects} = 10$, than when it was measured with a national group, $r = .47$, 95% CI [.43, .50], $I^2 = 89.36$, $k_{effects} = 77$. No other effects of target groups were observed. I^2 statistics indicate that heterogeneity is slightly reduced when only considering effect sizes within the same target group of fusion, however, remains very high even when accounting for target group.

Figure 5

Estimated Effects of Type of Identity Fusion



Note. Model 5 estimated effects of the type of identity fusion with error bars (colored) and observed effects (grey). All values refer to Fisher’s *Z*-transformed correlations. As the *z*-scores were used for visualization, minor differences between these estimates and the model results reported in Table 1 are expected.

5.6 Model 6: Effect of measurement scales

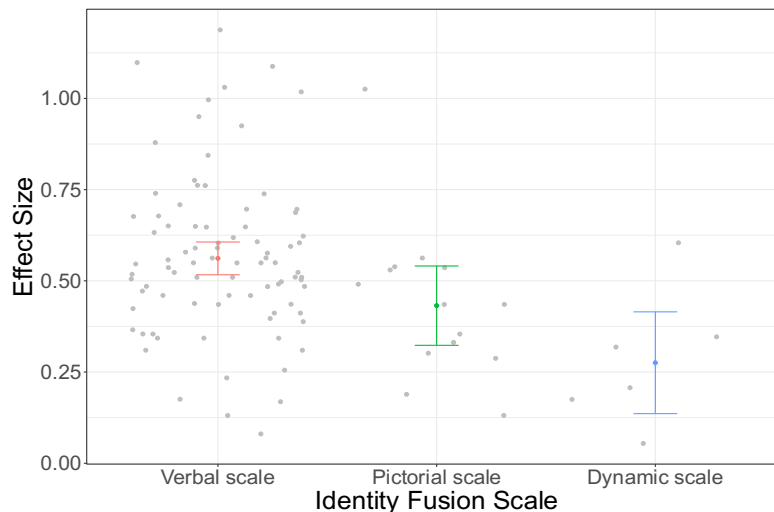
Model 6 tested whether effect sizes differed systematically depending on the specific scales used to measure identity fusion and extreme pro-group orientations (see Table 1, Model 6, and Figures 6 and 7). Compared to the most common verbal measure of identity fusion (Gómez et al., 2011), which exhibited an averaged effect size of $r = .51$, 95% CI [.47, .54], $I^2 = 90.88$, $k_{effects} = 85$, the dynamic identity fusion scale (Jiménez et al., 2016) correlated significantly weaker with extreme pro-group orientations, $r = .27$, 95% CI [.09, .43], $I^2 = 79.01$, $k_{effects} = 6$, as did the pictorial measure by Swann et al. (2009), $r = .41$,

95% CI [.31, .49], $I^2 = 83.89$, $k_{effects} = 14$ (see Figure 6). Of the latter two, results indicated that the dynamic scale performed worse. I^2 statistics indicated considerably high heterogeneity in effect sizes within all three measurement scales, however with slightly less variability in effect sizes associated with the dynamic and the pictorial scale compared to the verbal scale. Note that the dynamic and pictorial scale were represented by significantly less observations than the verbal scale, which might cause the smaller amount of variation.

Finally, compared to the most common outcome measure used in the identity fusion literature, willingness to fight/sacrifice, which exhibited an averaged correlation of $r = .48$, 95% CI [.44, .51], $I^2 = 91.07$, $k_{effects} = 87$, the collective action scales were significantly stronger correlated with identity fusion, $r = .61$, 95% CI [.49, .71], $I^2 = 84.95$, $k_{effects} = 7$. No significant difference was observed between correlations with the fight/sacrifice and the outgroup hostility scales, $r = .44$, 95% CI [.34, .53], $I^2 = 87.75$, $k_{effects} = 7$ (see Figure 7). Again, I^2 statistics indicate considerably high heterogeneity in effect sizes within all measurement scales, however with slightly less in the collective action scales and the outgroup hostility scales, which both are represented by a very small number of observations.

Figure 6

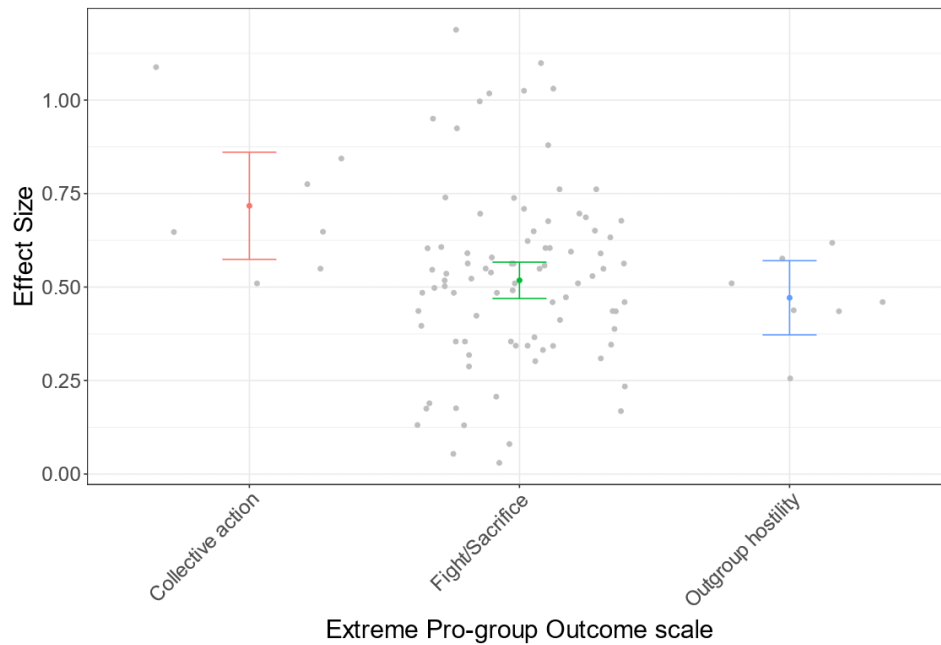
Estimated Effect Size Based on Identity Fusion Measurement Scales



Note. Model 6 estimated effects by fusion measurement type with 95% CI error bars (colored) and observed effects (grey). All values refer to Fisher's Z-transformed correlations. As the z-scores were used for visualization, minor differences between these estimates and the model results reported in Table 1 are expected.

Figure 7

Estimated Effect Size Based on Pro-Group Outcome Scales



Note. Model 6 estimated effects for different outcomes with 95% CI error bars (colored) and observed effects (grey). All values refer to Fisher's Z-transformed correlations. As the z-scores were used for visualization, minor differences between these estimates and the model results reported in Table 1 are expected.

5.7 PET-PEESE: Publication bias

The current analysis exhibited a significant PET intercept ($p < .001$), hence the PEESE results were interpreted. These revealed a significant unbiased effect comparable in size with the effects of the main analysis, $r = .46$, 95% CI [.42, .50], and no significant bias, $B = 3.03$, $p = .171$, 95% CI [-1.33, 7.38]. Note, however, that although state-of-the-art, PET-PEESE, similarly as other existing methods of publication bias assessment, may underperform if $I^2 > 80\%$ (Stanley, 2017). Because this threshold was largely exceeded in our analyses, PET-PEESE results must be interpreted with caution. Meanwhile, a sensitivity analysis was additionally conducted to assess whether effects from published studies differed from those from unpublished studies. A meta-regression model indicated no significant

systematic differences between published and unpublished effects, $B = .03$, 95% CI [-.06, .13], supporting the results of the PEESE model.

6 Discussion

Human beings are intrinsically social animals, and the cruciality of close and strong social ties and a sense of belonging for our survival and well-being is well acknowledged (Chryssochoou, 2004). History has shown that individuals are capable of performing actions that are entirely irrational and even compromises basic human survival instincts, in favor of their group. But why are some individuals willing to perform such actions for their group and others not? What are the psychological dynamics that can potentially explain such behavior? Identity fusion, conceptualized as a visceral feeling of oneness with a group, is commonly used to explain pro-group behaviors. The construct, which was introduced to the literature about a decade ago, has generated, in a relatively short period of time, a considerable number of interdisciplinary studies including participants from four continents and a large variety of contexts. However, the literature is largely inconsistent in how it operationalizes and measure identity fusion as well as extreme pro-group behavior, using a wide range of scales not readily comparable. Further, while this construct heterogeneity as well as the application across various contexts of groups and nationalities is necessary to establish the validity, generalizability, and applicability of the theory as an explanation of extreme pro-group behavior, a systematic meta-analysis on the aggregated results has been missing to date. The present paper addressed this gap by providing a meta-analysis investigated the averaged effect size of identity fusion observed across studies in the literature, as well as testing how different moderators may influence the relationship between identity fusion and extreme pro-group orientations. In doing so, it responded to a series of issues that have been central to the theory of identity fusion.

6.1 Effect of identity fusion on extreme pro-group orientations

The meta-analysis included more than half of a hundred studies, more than a hundred effect sizes, and more than thirty-five thousand participants from nine different countries, with four continents represented. The results confirmed a strong relationship between identity fusion and extreme pro-group orientations. That is, while reported effect sizes vary greatly across

studies in the literature, the general relationship between identity fusion and pro-group orientations is strong and robust, supporting the theoretical predictions and validity of identity fusion.

Further, results suggested that identity fusion is significantly stronger related to extreme pro-group orientations than is social identification, indicating superior predictive validity of identity fusion on the outcome measures of the current study sample. Importantly, this analysis was conducted only including studies that assessed both identity fusion and social identification effects, increasing the validity of results in terms of contrasting the different paradigms. Thus, results are in line with previous work (Buhrmester et al., 2014; Gómez & Vázquez, 2015b; Swann & Buhrmester, 2015), arguing that synergistically interacting identities and a stronger contribution from personal agency induces more action potential and dedication to extreme group goals than mere identification with groups (Heger & Gaertner, 2018). While this has been previously shown in single studies, the present results empirically give support for this difference meta-analytically. Results, thus, provide evidence for identity fusion being a particularly well-suited theoretical explanation of extreme pro-group behavior and outcomes. Nevertheless, it remains a question whether the observed differences indeed reflect qualitative differences in the theoretical explanations of pro-group behavior, or merely differences in the measurement scales used to quantify degree of identity fusion and social identification. Although social identity and identity fusion have different theoretical perspectives on the role of identities in group alignment and agency, some authors still debate the extent to which the two theories are distinct or whether identity fusion constitutes an element of social identification (Vignoles, 2018). The most common instrument to measure social identification (which is also used in the vast majority of included studies here) include items like “*When someone criticizes [group], it feels like a personal insult*”, “*When I talk about [group], I usually say “we” rather than “they”*”, and “*This [group]’s successes are my successes*” (Mael and Ashforth, 1992). It can be argued that these items as well measure a sense of overlap between the self and the group, however, in a less directly manner than the items of identify fusion scales. Thus, while the theories differ in some main explanatory aspects of extreme pro-group behavior, it is not readily evident whether the scales measure distinct experiences of self-group relationships. Thus, results do not necessarily lend themselves to conclusions that identity fusion theory provide a better explanation of extreme pro-group behavior, but rather that the scales used for identity fusion better capture the feeling of oneness with the respective group.

6.2 Identity fusion moderated by country

Results further indicated that the relation between fusion and pro-group orientations differed across countries. This could indicate that tendencies to experience fusion with a group causing one to commit extreme pro-group actions is dependent on cultural aspects. However, only a very limited number of studies was conducted outside Spain and the US, and therefore, these differences should be interpreted cautiously considering the possibly limited precision of the meta-analytical effects observed in other countries. Further, the variation of measurement instruments used across cultures make direct comparisons between studies problematic. As such, more research from diverse cultural contexts using the same measurement scales, is needed. One potential hypothesis here is that countries characterized as highly collectivistic might exhibit stronger effects of identity fusion than countries characterized as highly individualistic. In highly collectivistic cultures, like Japan and China, individuals tend to be much more dependent (practically and socially) on for instance family ties, and the culture itself is organized as to emphasize the importance of the community and foster homogeneity. Contrary, highly individualistic cultures, like those of Scandinavia, to a much larger extent emphasizes independence of the individual and foster heterogeneity. It seems intuitive that collectivistic cultures thus might induce stronger tendencies of identity fusion and action on behalf of a group. However, although identity fusion would prove to be more prevalent in collectivistic cultures this does not necessarily mean that it would also cause more extreme pro-group behavior. As such, assessing such potential differences may benefit greatly development of the identity fusion paradigm. If this is not the case, this would indicate that the relationship between identity fusion and pro-group behavior may not be bidirectional, i.e., individuals who engage in extreme pro-group behavior may always show strong identify fusion with their group, while strong identity fusion may not always lead to willingness to engage in extreme pro-group actions. Unfortunately, while the sample of the present meta-analysis included China, this was represented by only one effect size, and hence differences could not be adequately addressed statistically. Future cross-cultural designs may help directly establishing the cultural influence on the role of identity fusion.

6.3 Identity fusion moderated by age but not gender

The meta-analysis further addressed moderating effects of demographic variables. Results indicated that the effects of identity fusion on extreme pro-group behaviors decrease when the mean age of the studies increase. It is important to note here, that no direct test of the linear effect of age was possible, as only the mean age and group effects of fusion was

reported in the included studies. However, results indicate that effects based on older populations tend to be smaller. If this is indeed a true effect, it could suggest either 1) older individuals generally feel less fused with social groups and also engage less in extreme pro-group behaviors, or 2) older individuals exhibit equal tendencies of identity fusion, however, this does not influence their willingness to engage in extreme pro-group behaviors. Future studies should assess whether the degree of identity fusion varies with age to provide insights on the underlying explanation of these results. Unfortunately, this was not possible to investigate in the current analysis, as mean identity fusion scores were not consistently reported in the included studies.

No effect of gender distribution on the effect of identity fusion was observed. This may suggest that males and females are equally liable to engage in extreme group-behaviors given strong identity fusion. However, this could also result from very little variation in gender distribution across the included studies. The large majority of studies had a relatively balanced sample (skewed slightly towards more females) with a mean percentage of females of 46.45 and very little variation around the mean (see distribution in Appendix, Figure 7). Hence, statistically robust differences may not have been detectable in the current sample.

6.4 Stronger effect of identity fusion targeted at outgroups than country

The meta-analysis additionally assessed differences in the effect of identity fusion related to the specific type of group fusion is targeted towards and found that compared to the most commonly addressed type of fusion, with *country*, identity fusion with an *outgroup* had a significantly stronger effect on extreme pro-group orientations. Outgroup here refers to a group of individuals that you are not part of yourself but somehow emphasize with (e.g., engaging in extreme activism in support of others' political struggles; Kunst et al., 2018). This suggest that individuals not necessarily experience more identity fusion with outgroups than with their country, although this is possible, but that *if* they experience identity fusion with an outgroup they are more likely to engage in extreme pro-group actions on behalf of that group. First, studies should aim to establish which of the two explanations seems most plausible for this finding. Second, regardless of whether this pattern occurs due to stronger fusion with outgroup or stronger effect of fusion on pro-group behavior, it indicates interesting aspects of identity fusion that might inform further developments of the paradigm. One explanation could be that sympathy is a strong driver of the effect of identity fusion, as individuals might experience more sympathy with groups of struggling others, than with a group which they consider themselves part of. Another explanation may be that engaging in

extreme actions on behalf of another group may not involve similar feelings of responsibility or dependence. Individuals may be more willing to participate in such actions if a way out is more readily available and justified, than it would be if it was on behalf of your own group. Contrary, the stronger effect of fusion with an outgroup could also find its explanation in that stronger identity fusion is necessary for individuals to engage in extreme behaviors on behalf of an outgroup. Arguably, for people to fuse with an outgroup a higher degree of emotional involvement or possibly admiration (Gómez et al., 2021) may be needed than for fusion with a group one was born into or belonged to for long periods of time (i.e., one's nation). Further studies should aim to address such dynamics, potentially by investigating the emotional antecedents and correlates of identity fusion with ingroups and outgroups.

6.5 Differences in predictive ability of measurement scales

Identity fusion is measured with a variety of instruments in the literature, thus the present analysis addressed whether effects of fusion differ systematically dependent on the specific scale. Results indicated that while all scales exhibit a strong effect on extreme pro-group orientations, the choice of measurement significantly influences the results. Particularly, the studies using the verbal scale yielded significantly stronger effects of identity fusion than did the dynamic scale but had comparable predictive power to the pictorial scale. At face value this suggests that the dynamic scale in general have significantly weaker predictive power with regards to extreme pro-group orientations. This finding is surprising, as the dynamic and pictorial scales resembles each other to a much greater extent (with one pictorial item), than do the verbal and pictorial scales. Thus, one would expect that if scales differed in predictive power, the pictorial and dynamic scales would both differ from the verbal scale. Further, considering the relatively low number of studies conducted with both the dynamic scale ($n=6$) compared to the verbal and pictorial scale ($n=86$ and $n=14$, respectively), results should be interpreted cautiously. Generally, the different scales are represented unevenly in the literature and studies measuring identity fusion on the same sample using all three measurement scales are warranted to clarify differences in predictive ability.

The effects of fusion depended further on the type of extreme pro-group outcome assessed. Generally, fusion was more strongly associated with extreme collective action than willingness to fight and sacrifice or extreme outgroup hostility. These results may suggest that collective actions are more dependent on the extent to which individuals of the group experience identity fusion than are for instance willingness to fight or die for the group. This could be explained by the fact that collective actions are not as radical actions to engage in as

is dying for your group, and that such outcomes simply occurs more often than the remaining two. Contrary, it could indicate that smaller degrees of fusion is needed in order for individuals to be willing to engage in collective actions compared to fight/sacrifice or outgroup hostility, i.e., the “fusion threshold” for such types of behaviors is lower, which would increase the predictive ability of identity fusion for those specific outcome measures. Again, it is important to note that only few studies so far have been conducted with extreme collective action or outgroup hostility ($n=7$ and $n=7$, respectively), compared to fight/sacrifice ($n=92$), rendering estimated averaged effects more unstable. Further, studies conducted with fight and sacrifice outcomes yielded high heterogeneity and more studies than 7 seven studies with fight and sacrifice outcomes indeed exhibited larger effect sizes than those of collective action, albeit the lower averaged effect (Model 6, Figure 7). Hence, it cannot be readily concluded that identity fusion has a stronger effect on willingness to engage in extreme collective actions than to fight and sacrifice or to exhibit outgroup hostility.

6.6 Methodological limitations

While the results presented in this meta-analysis provided a robust assessment of the association between identity fusion and extreme pro-group outcomes, some important methodological limitations should be noted. First, although the meta-analysis assessed fusion effects measured in various settings, most studies in the literature were conducted in a smaller selection of WEIRD countries (Henrich et al., 2010). As such, we were unable to systematically test with adequate power for the influence of country-level variables. Large-scale cross-cultural studies may provide important insights into the conditions that favor extreme pro-group outcomes.

Second, an important limitation of the current study is that some effects included were conversions of correlation coefficients from either beta coefficients or odds-ratio estimates. While the analysis showed no significant differences between these types of effect and both conversion methods are commonly used, it cannot be determined whether the conversion procedure altered the actual effects reported in the respected studies. The Peterson and Brown (2005) method to convert beta coefficients to correlation estimates is justified by the authors by the fact that beta and r estimates are highly correlated. Further, they conducted extensive simulation studies showing that the relationship is not substantially affected by the number of predictors in the model. However, a serious issue with this method is that conversion is only

performed for positive beta coefficients ($r = \text{beta} + 0.5$), while negative coefficients are simply kept as the correlation coefficient. Hence, the distance between negative and positive correlation estimates will be skewed across studies, towards stronger effects of positive estimates. A similar issue arises from the fact that only beta coefficients between -0.5 and 0.5 are recommended to be converted while estimates outside of this interval are kept as the correlation coefficient. Hence, the conversion procedure will add weights to weaker effects but not to stronger effects. While Peterson and Brown (2005) present compelling evidence of the high correlation between beta coefficients and correlations regardless of the amount of model parameters, other authors argue, that averaging across regression effect sizes in general poses serious concerns. This is argued to be because regression slopes (beta coefficients) are only identically distributed across studies when 1) both dependent and independent variables of the model are measured similarly, and 2) when scores of the dependent and independent variables are distributed similarly (Becker & Wu, 2007). Given the variety of regression models typically included in meta-analyses, as well as in the present study sample, including structural equation models, hierarchical linear models, interaction models, and random effects models, it remains a serious concern as to what extent synthesizing these results are meaningful. On the contrary, not including these studies would impose a different problem as the meta-analysis would be greatly reduced in statistical power, similarly yielding less robust results. Despite the issues with conversion of beta coefficients, this method remains the most widely applied in the meta-analytic literature, and Peterson and Brown (2005) additionally argue that regression coefficients are in themselves associated with large degrees of uncertainty caused by sampling variance, outliers, random noise, etc. Hence, any certainty related to conversion will always be smaller than uncertainty already inherent in those estimates, as indicated by the consistently strong correlations between correlation estimates and beta coefficients.

An additional methodological limitation concerns the use of the PET-PEESE test as a test of publication bias. While PET-PEESE consistently outperforms conventional methods to address publication bias (Stanley, 2017), simulation studies show that it is highly sensitive to heterogeneity in the sample. With high levels of heterogeneity, the PET-PEESE tends to become type I error inflated (Stanley, 2017). Hence, it is generally not recommended to use this method if the model I^2 exceeds a value of .80, which was the case for all models in the present meta-analysis. However, this issue is much worse in other methods of publication bias tests (Stanley, 2017), hence, the PET-PEESE remained the best option. Additionally, a

regression analysis testing the effect of published versus unpublished articles showed no significant differences. An important notion here is that while high heterogeneity in the study sample reduces the reliability of publication bias tests, this does not solely reflect an issue with testing for publication bias but indicates, more generally, that effect sizes between studies differ to such an extent, that publication bias would not have any meaningful influence in any case. Rather, theoretical, or methodological discrepancies between the individual studies seems to be a more emergent issue.

6.7 Limitations pertaining to the general paradigm of identity fusion

As indicated by the present results, studies of identity fusion exhibit high heterogeneity in the estimated relationship between identity fusion and extreme pro-group behaviors. Further, this heterogeneity was only slightly reduced by the investigated moderators, highlighting that most of this heterogeneity cannot be attributed to reported differences in study designs or methods. There are several limitations to the general field of identity fusion research that deserves mentioning and which could possibly account for at least some of this variation in results.

First, while identity fusion theory aims to explain extreme pro-group *behaviors* all measurement scales typically used in the literature assess *intentions* or *believed willingness* to engage in behaviors. There are obvious reasons for this, as extreme behaviors are relatively rare and committed by a sample of the population that is not typically represented in the study sample of participants. Hence, measuring whether individuals would actually perform such extreme pro-group actions (e.g., sacrificing your life for the group) remains in most cases impossible to measure for practical and ethical reasons. However, the extent to which measurements of hypothetical behaviors indeed reflect actual behaviors is questionable. It seems intuitive, for instance, that more people would report being willing to fight or sacrifice for their country than in fact do it. Thus, even when a robust relationship is observed in the literature between identity fusion and extreme pro-group behaviors, this is more an indication of the effect of fusion on *intentions* or *beliefs* about one's own behavior, and it remains unresolved whether identity fusion predict actual extreme behaviors. However, recent results indicating that jihadists in prisons express higher levels of fusion than Muslims imprisoned for crimes unrelated to terrorism support the relation between fusion and extreme behaviors (Gómez et al., 2021). Other examples supporting the predictive validity of fusion with a

group have been found among Libyan insurgents fighting against the Gaddafi regime (Whitehouse et al., 2014), captured ISIS fighters (Gómez et al., 2017), Pakistani participants supporting the Kashmiri cause (Pretus et al., 2019), supporters of an Al Qaeda associated group (Hamid et al., 2019), Northern Irish loyalist and republican paramilitaries (Ferguson & McAuley, 2020), and fighters against the Islamic State including Peshmerga, Iraqi army Kurds, Arab Sunni Militia (Gómez et al., 2017) and foreign fighters (Kunst et al., 2018). Nevertheless, as most studies have largely assessed extreme pro-group outcomes with self-report scales, the meta-analytic results must be interpreted accordingly. Future research may therefore profit from the assessment of the consequences of identity fusion using behavioral outcomes.

An additional issue in the literature was highlighted by the fact that most of the studies were cross-sectional, i.e., a snapshot of a single point in time. This reduces the ability of the field to disentangle cause and effect, as no temporal relationship between the two measures can be investigated. Thus, correlations between the two constructs could in theory be purely spurious and induced by an unmodelled common cause, i.e., a third variable that causes both individuals to experience identity fusion and to commit extreme pro-group behaviors. This would cause the two to be highly correlated without identity fusion exerting any influence on extreme pro-group behaviors. The field may benefit from an increased focus on longitudinal studies that could address the temporal relationship between the two constructs. In addition, the development and validation of new experimental procedures to manipulate identity fusion could provide important insights into the true causal effects of identity fusion on extreme pro-group behaviors. Indeed, evidence indicate that effects generally tend to decrease when assessed with experimental or longitudinal data compared to observational cross-sectional data (Bierwiazzonek & Kunst, 2021). Hence, the strong averaged effect of identity fusion observed in the present meta-analysis is possibly inflated by lack of causal control in cross-sectional study designs.

7 Conclusion

According to identity fusion theory, individuals can come to commit extreme actions on behalf of their group, risking both the lives of others and the self, because social and individual dynamics can cause our experienced identity to be fused with that of the group. Hence, the goals and desires of the group come to be fused with those of the individual.

Scholars have productively conducted research on the role of identity fusion as predictor of pro-group orientations over the past decade. While identity fusion has been addressed in a variety of contexts, in a variety of countries and employing a variety of outcome measures, results are relatively inconsistent, and a systematic assessment of the aggregated evidence for identity fusion as a predictor of extreme pro-group behavior has been lacking to date. This paper presented the first meta-analysis on identity fusion, and as such provide an enhanced objective and reliable aggregation of results from a large body of identity fusion research.

Using robust variance estimation, the current analysis addressed the overall evidence of identity fusion as predictor of extreme pro-group orientations, and further investigated the potential moderating effect on this relationship of a set of variables. The results showed that the construct is robustly associated with extreme pro-group outcomes. Identity fusion predicts a variety of such outcomes over and above social identification, across cultures and different group settings. Hence, the present analysis provide strong support for the explanatory relevance of identity fusion theory in regard to extreme pro-group orientations.

Further, results showed that this relationship was moderated by age, country of data collection, target group of identity fusion, and measurement scales of both identity fusion and extreme pro-group outcomes. These findings suggest that the relationship between identity fusion and extreme behaviors on behalf of the group may be contextually sensitive and culturally dependent. However, as many of the moderators were represented by very small samples of studies, these results should be interpreted with caution. Rather, the warrant further research in the field of identity fusion to investigate the exact nature of relationship between these moderators and identity fusion.

Results further indicated general limitations and concerns within the paradigm of identity fusion. Generally, reported effect sizes were extremely heterogeneous, and only a small fraction of this was accounted for by the moderating variables. Thus, future research should aim to reduce such heterogeneity by, for example, converging on similar measurement instruments or adapting longitudinal and experimental study designs that can more effectively disentangle cause and effect relationships. Further, cross-cultural designs should allow better comparison of identity fusion effects across countries.

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9 Appendix

Table 1. *Main Characteristics of Studies Included in the Meta-Analysis*

Author	Year	Country	N	Male (%)	Mean age	Fusion scale	Outcome scale	Fusion type
Besta et al.	2014a	Poland	109	44.00	26.76	Verbal	Fight and die	Religion
		Poland	365	46.00	21.84	Verbal	Fight and die	Country
Besta et al.	2014b	Poland	203	69.00	34.20	Pictorial	Fight and die	Country
Besta et al.	2015	Poland	155	52.26	19.60	Verbal	Fight and die	Country
		Poland	24	91.67	22.90	Verbal	Fight and die	Country
Besta & Kossakowski	2018	Poland	568	88.56	27.02	Verbal	Collective action	Other groups
Bortolini et al.	2018	Brazil	387	45.20	28.90	Verbal	Fight and die	Country
		Brazil	372	33.30	30.40	Verbal	Fight and die	Religion
		Brazil	401	47.60	30.40	Verbal	Fight and die	Other groups
Buhrmester et al.	2015	US	80	38.00	26.00	Verbal	Support actions	Country
		US	120	46.00	37.30	Verbal	Fight/die/sacrifice	Country
		US	133	42.00	34.00	Verbal	Donations	Country
		US	133	42.00	34.00	Verbal	Support actions	Country
Carnes & Lickel	2018	US	204	41.70	35.44	Verbal	Fight and die	Country
Gómez et al.	2011a	Spain	86	36.05	33.42	Pictorial	Fight and die	Country
		Spain	460	19.13	32.10	Pictorial	Fight and die	Country
		Spain	194	21.13	34.22	Pictorial	Fight and die	Country
Gómez et al.	2011b	Spain	620	27.00	32.64	Verbal	Fight and die	Country
		Spain	92	42.40	33.88	Verbal	Fight/die/sacrifice	Country
		Spain	93	49.50	34.09	Verbal	Fight/die/sacrifice	Country
		Spain	79	15.20	31.05	Verbal	Fight and die	Country
		Spain	37	13.50	30.86	Verbal	Fight and die	Country
		US	357	33.00	34.79	Verbal	Fight and die	Country

		Spain	1981	28.00	31.64	Verbal	Fight and die	Country
Gómez et al.	2019	Spain	1151	37.00	37.11	Verbal	Fight and die	Country
		Spain	458	41.00	37.14	Verbal	Fight and die	Country
Heger & Gaertner	2018	US	190	46.00	NA	Verbal	Fight and die	Other groups
		US	189	43.00	NA	Verbal	Fight and die	Other groups
Jiménez et al.	2016	Spain	95	20.00	34.78	Dynamic	Fight and die	Country
Kavanagh et al.	2019	World	605	95.40	31.27	Verbal	Outgroup prejudice (item 1)	Other groups
		World	605	95.40	31.27	Verbal	Outgroup prejudice (item 2)	Other groups
		World	605	95.40	31.27	Verbal	Outgroup prejudice (item 3)	Other groups
Kossakowski & Besta	2018	Poland	309	87.40	26,00	Verbal	Extreme endorsement	Other groups
Kunst et al.	2018	Norway	215	40.90	24.99	Verbal	Extreme protest	Outgroup
		US	201	56.70	34.60	Verbal	Extreme protest	Outgroup
		US	234	45.70	36.13	Verbal	Extreme protest	Outgroup
		US	83	96.30	31.60	Verbal	Fight/die/sacrifice (part 1)	Outgroup
		US	83	96.30	31.60	Verbal	Fight/die/sacrifice (part 2)	Country
		US	83	96.30	31.60	Verbal	Fight/die/sacrifice (part 1)	Country
		US	83	96.30	31.60	Verbal	Fight/die/sacrifice (part 2)	Outgroup
Kunst et al.	2019	US	176	41.50	43.19	Verbal	Political extremism	Political
		US	176	41.50	43.19	Verbal	Policy support	Political
		US	171	49.80	43.18	Verbal	Political extremism	Political
		US	176	46.60	45.09	Verbal	Terror support	Political
Newson et al.	2018	Brazil	465	95.00	25.72	Verbal	Fight and die	Other groups
Paredes et al.	2018	Spain	155	25.00	35.21	Verbal	Fight and die	Country
Paredes et al.	2019	Spain	299	38.00	35.88	Verbal	Fight and die	Country
		Spain	607	35.00	34.51	Verbal	Fight and die	Country
		Spain	483	44.00	37.19	Verbal	Fight/die/sacrifice	Country
Swann et al.	2014a	World	2438	35.00	24.06	Verbal	Fight and die	Country

		China	82	48.20	20.82	Verbal	Fight and die	Country
Swann et al.	2014b	Spain	85	20.00	31.40	Verbal	Self-sacrifice	Country
		Spain	293	46.10	36.71	Verbal	Self-sacrifice	Country
		Spain	436	44.50	33.90	Verbal	Self-sacrifice	Country
		Spain	572	34.10	33.21	Verbal	Self-sacrifice	Country
		Spain	1368	44.17	35.14	Verbal	Self-sacrifice	Country
		Spain	622	42.60	34.48	Verbal	Self-sacrifice	Country
Swann et al.	2010	Spain	62	53.23	33.47	Pictorial	Fight/die/sacrifice	Country
		Spain	207	20.30	34.23	Pictorial	Fight/die/sacrifice	Country
		Spain	66	27.27	37.24	Pictorial	Fight/die/sacrifice	Country
		Spain	171	28.65	36.07	Pictorial	Fight/die/sacrifice	Country
Swann et al.	2009	Spain	177	42.94	33.05	Pictorial	Fight and die	Country
		Spain	602	13.62	31.17	Pictorial	Fight and die	Country
		Spain	326	14.72	31.06	Pictorial	Fight and die	Country
		Spain	429	11.95	15.81	Pictorial	Fight and die	Country
Talaifar & Swann	2019	US	303	44.60	36.60	Verbal	Fight and die	Country
Vázquez et al.	2015	Spain	1522	41.60	32.28	Verbal	Fight and die	Country
Vázquez et al.	2019	Spain	248	41.00	31.95	Verbal	Fight and die	Kinship
		Spain	248	41.00	31.95	Verbal	Fight and die	Kinship
Whitehouse et al.	2017	US	122	46.20	37.74	Verbal	Extreme endorsement	Country
		UK	725	88.90	39.50	Verbal	Fight and die	Other groups
		US	146	47.30	32.45	Verbal	Extreme endorsement	Outgroup

Table 2. Verbal scale of identity fusion (Gómez et al., 2011)

1. I am one with my country

2. I feel immersed in my country.

3. I have a deep emotional bond with my country.

4. My country is me.

5. I'll do for my country more than any of the other group members would do.

6. I am strong because of my country.

7. I make my country strong

Figure 1. Pictorial scale of identity fusion (Swann et al., 2009)

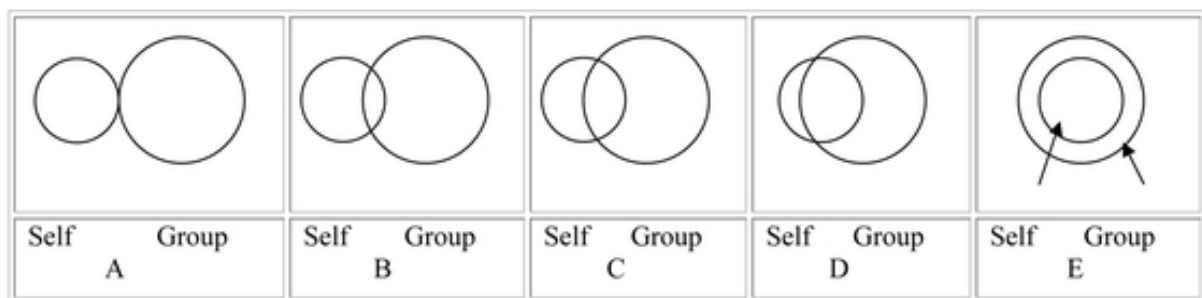


Figure 2. Example of the Dynamic Scale of Identity Fusion (Jimenez et al., 2015)

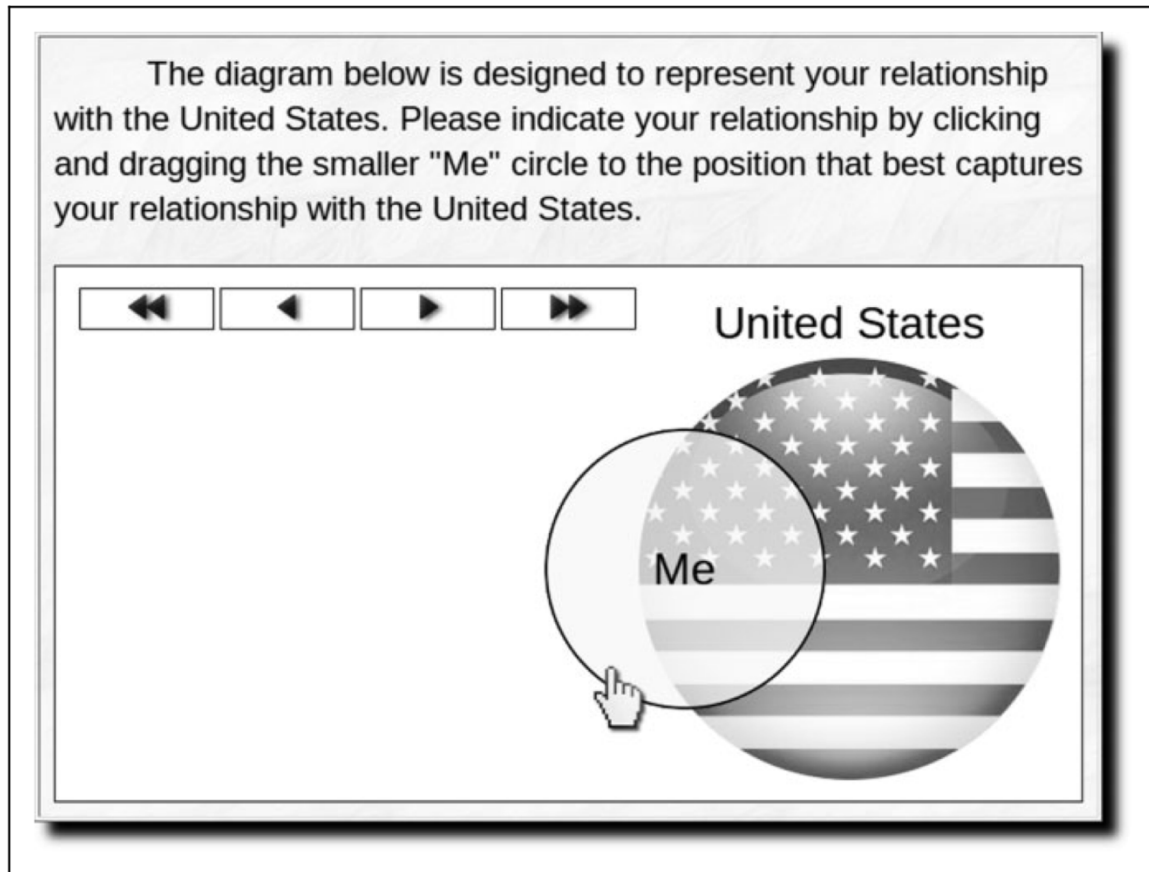


Table 3. Organization Identification Index (OID) (Mael and Ashforth, 1992)

1. When someone criticizes (name of school) it feels like a personal insult.

2. I am very interested in what others think about (name of school).

3. When I talk about this school, I usually say "we" rather than "they".

4. This school's successes are my successes.

5. When someone praises this school, it feels like a personal compliment.

6. If a story in the media criticized the school, I would feel embarrassed.

Figure 3. Sample distribution of Identity Fusion effect sizes

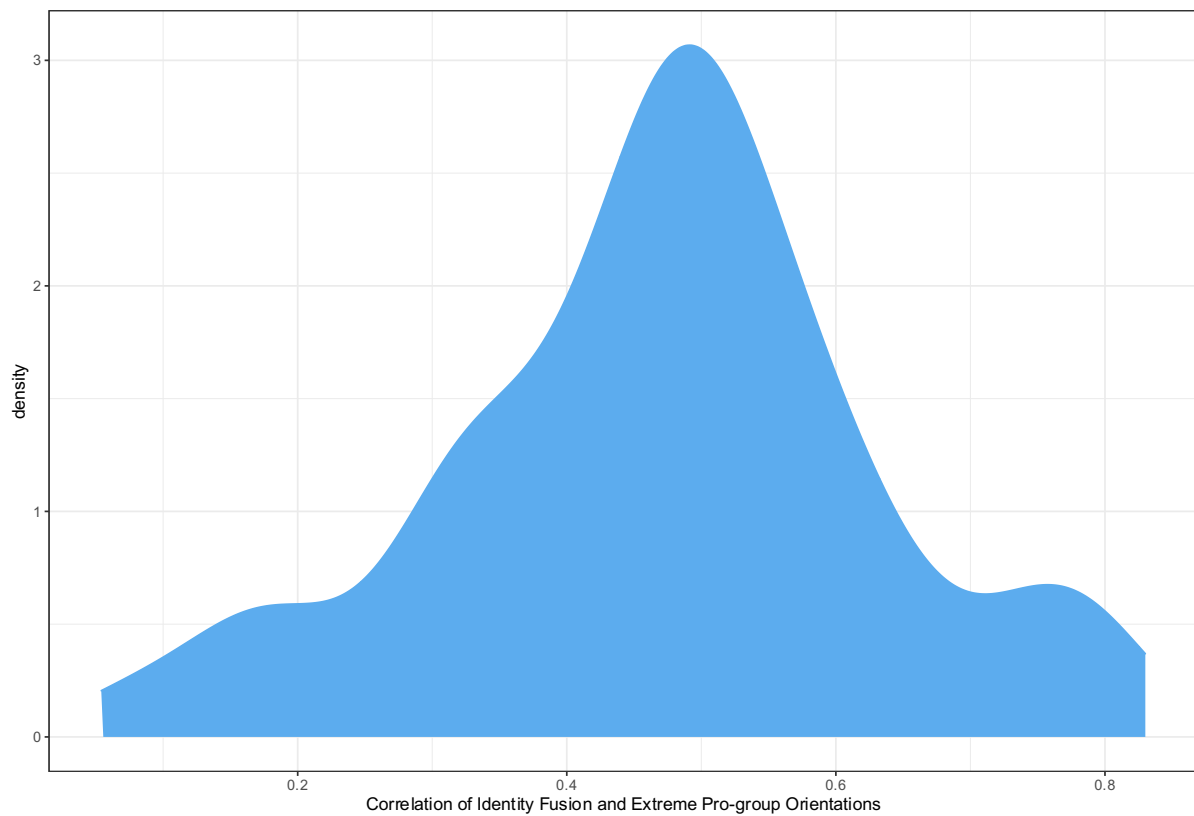


Figure 4. Sample distribution of Social Identification effect sizes

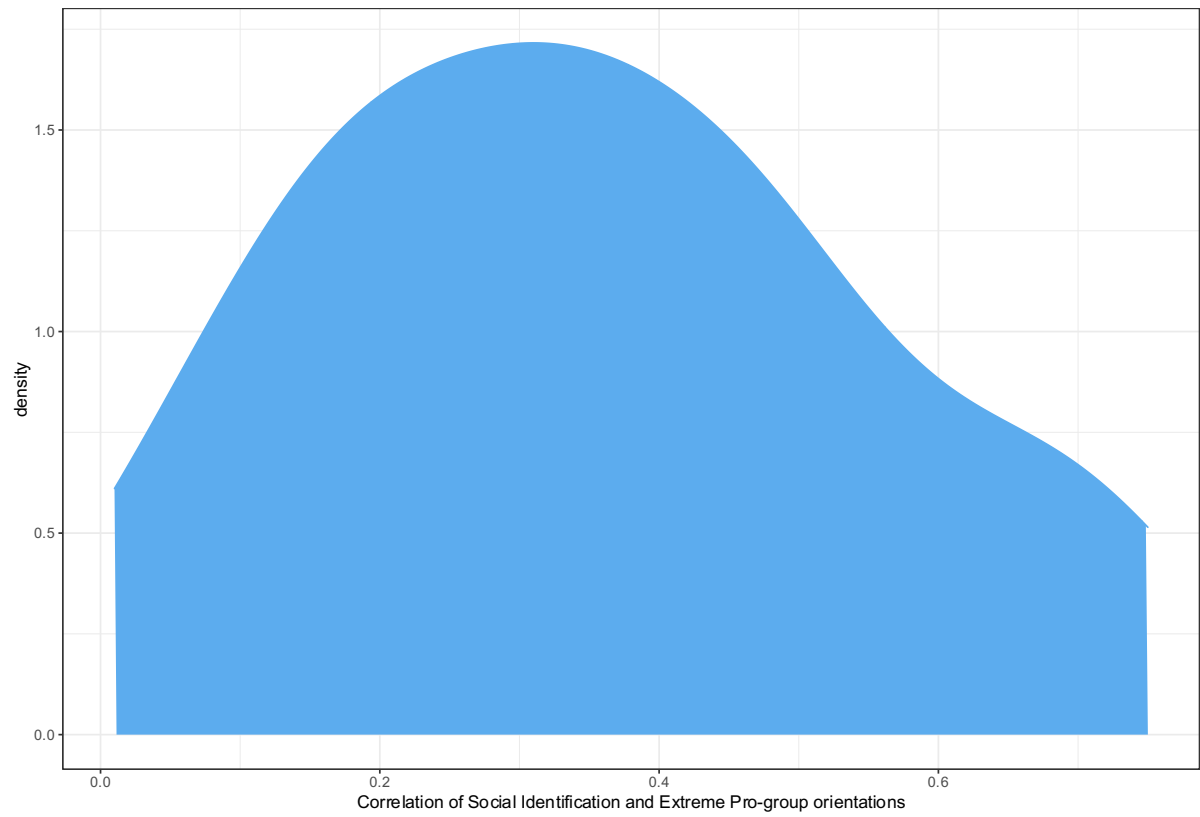


Figure 5. Sample distribution of sample size (n)

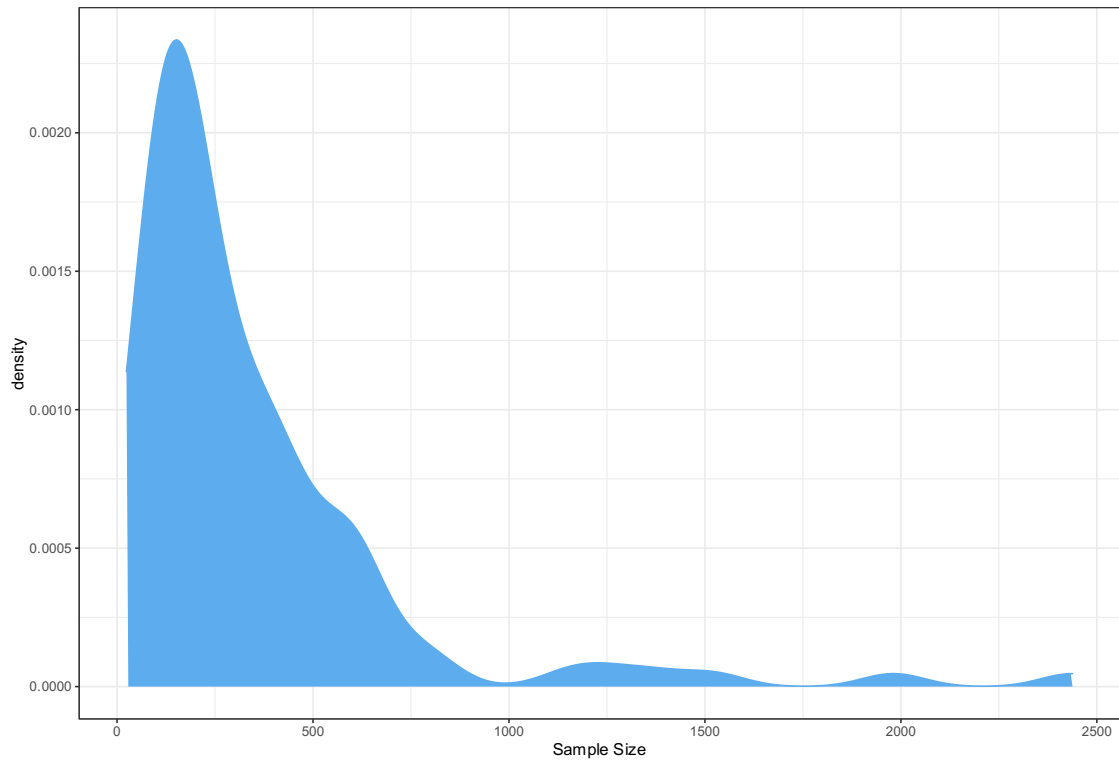


Figure 6. Sample distribution of mean age

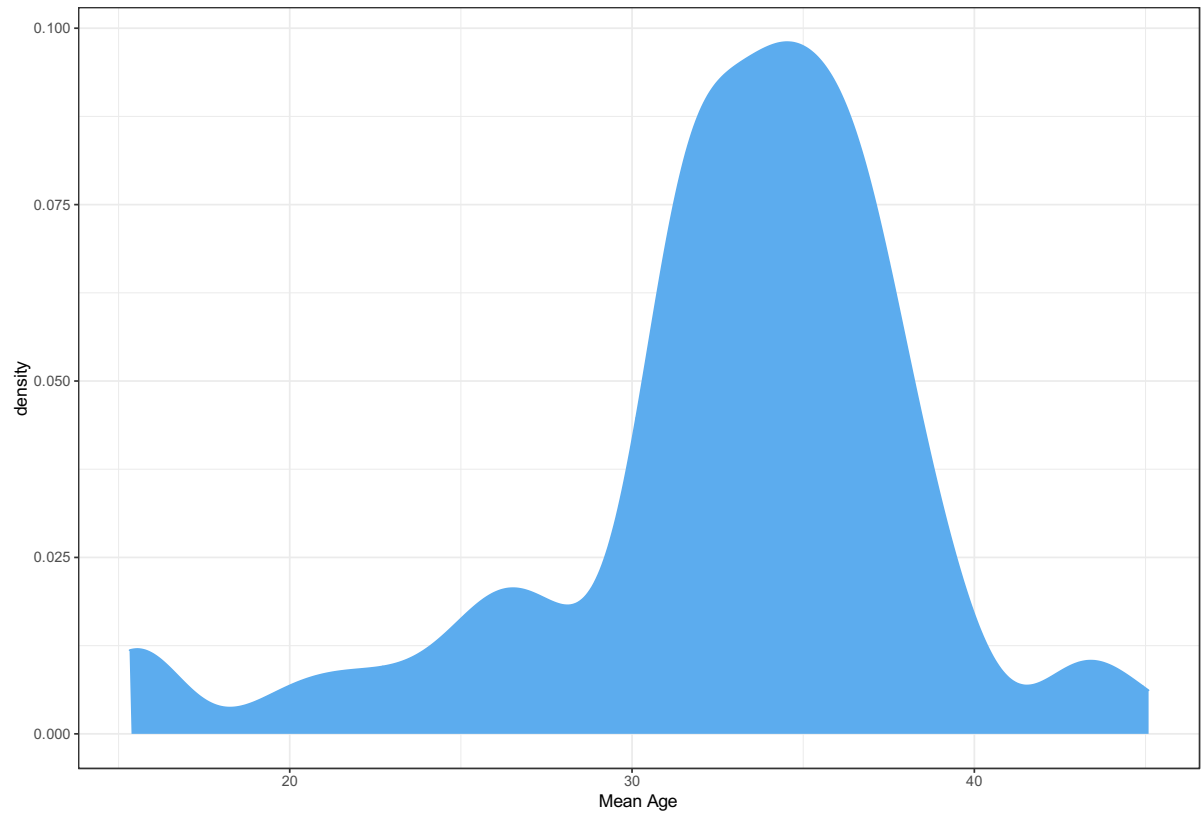


Figure 7. Sample distribution of % male

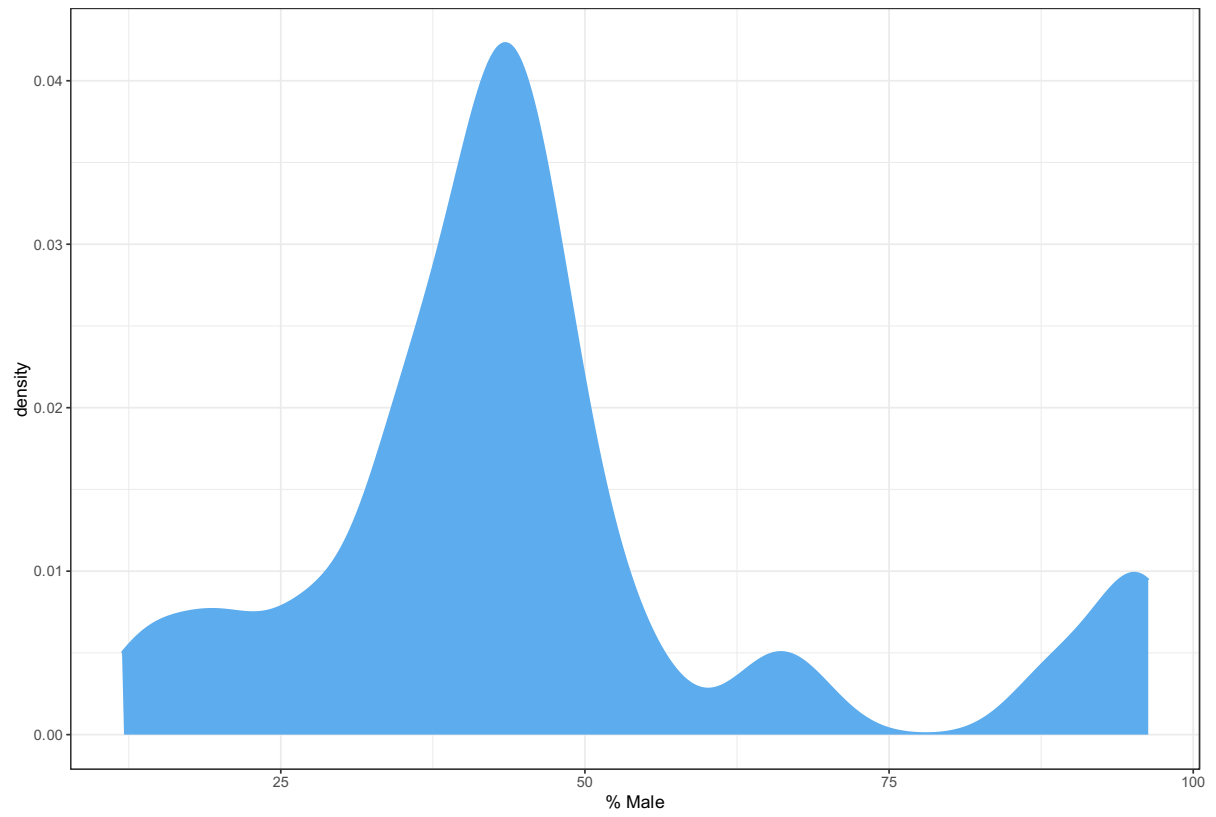


Figure 8. Sample distribution of country

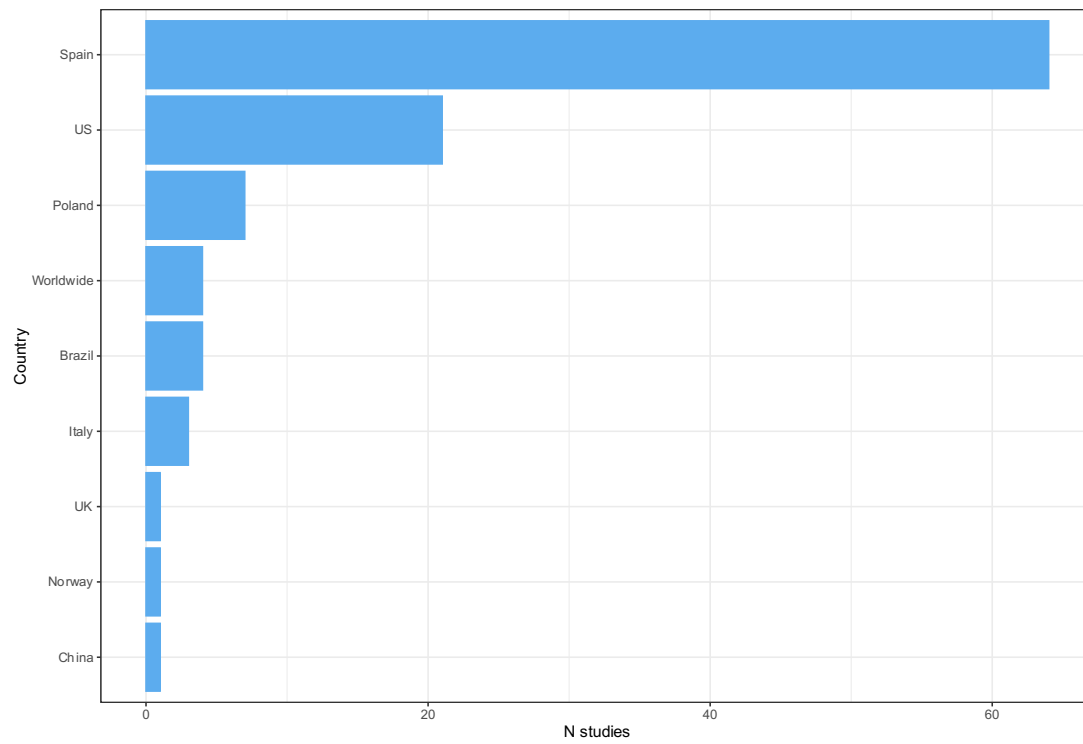


Figure 9. Sample distribution of extreme pro-group outcome categories

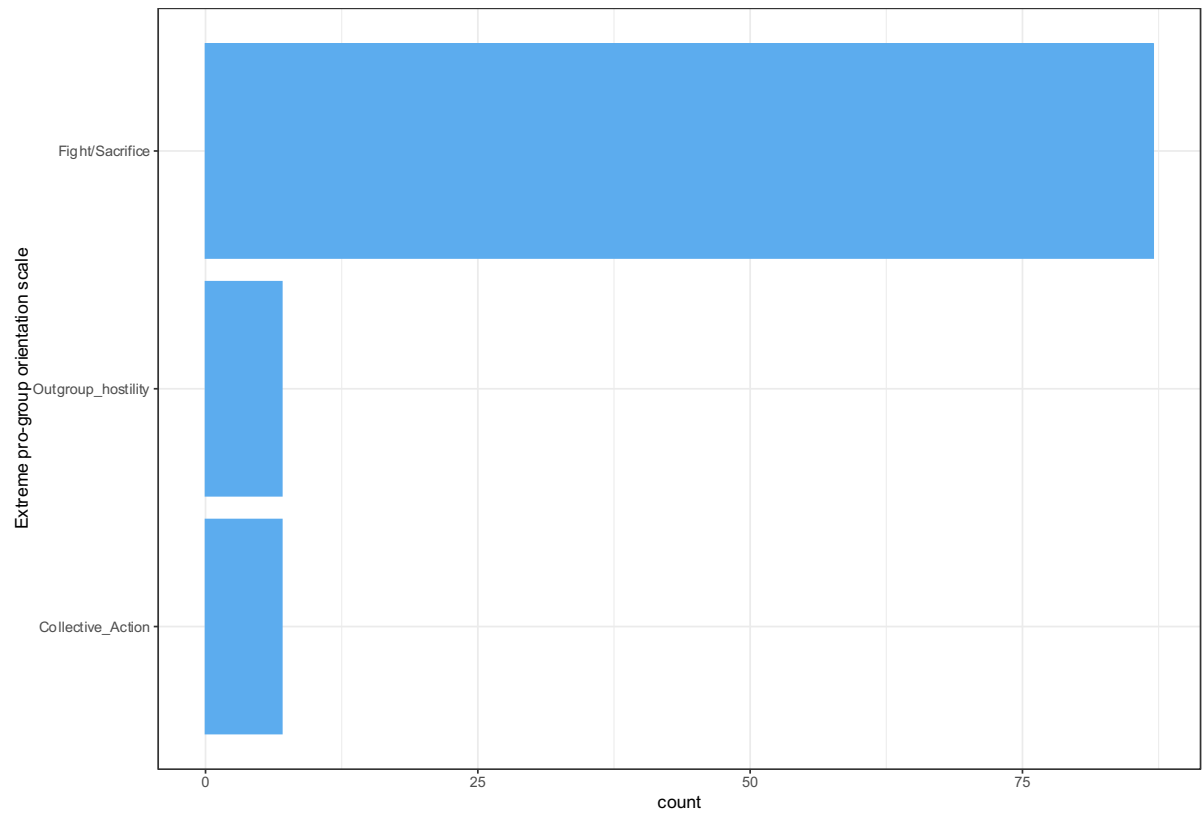


Figure 10. Sample distribution of Identity Fusion scales

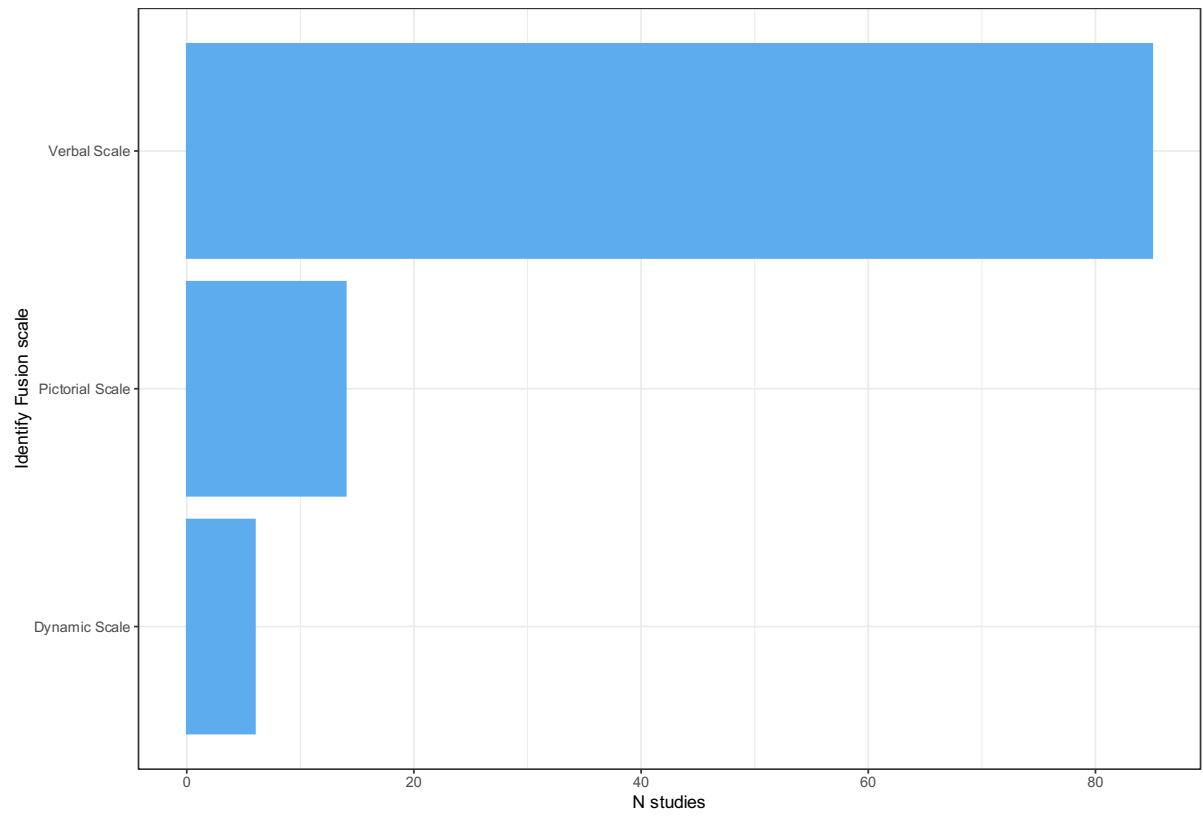


Figure 11. Forest plot of estimated effect sizes

