Personality and Social Psychology Bulletin
2017, Vol. 43(3) 418–433

DOI: 10.1177/0146167216688202
pspb.sagepub.com
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Permeability of Group Boundaries: Development of the Concept and a Scale

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Abstract

The perceived possibility of movement between groups, referred to as permeability of group boundaries, is considered a key factor in explaining intergroup relations. However, so far, permeability has been conceptualized in different ways and there exists no validated measure. Integrating different conceptualizations, we developed a scale distinguishing *membership* permeability (e.g., a person changing from one sport team to another) versus *status* permeability (e.g., a person acquiring a higher social status). Scale validation occurred across samples representing five lower status groups (older adults, women, obese, lower educated, ethnic minorities). Our scale was related to central indicators of intergroup relations such as self-reported intergroup attitudes (e.g., identification) and endorsement of behavioral strategies (individual mobility, collective action). Moreover, it distinguished permeability characteristics of different types of social groups. The scale provides a novel theoretical conceptualization of permeability and can be used to examine levels and correlates of permeability perceptions across social groups.

Keywords

permeability of group boundaries, social mobility, social change, group identification, categorization of social groups

Received July 12, 2016; revision accepted December 11, 2016

Memberships in social groups such as families, sport teams, ethnic groups, or age groups give people a sense of meaning and belonging and often provide access to important resources (S. A. Haslam, Jetten, Postmes, & Haslam, 2009). Group memberships are also flexible as people may wish to change groups or get access to an outgroup's resources, for example, when the own group is in a disadvantaged position. This can occur by taking on a different group membership, such as when a person changes employers or sports teams. In such cases, boundaries between groups are permeable. In other cases, it may be impossible to change group membership (e.g., for most in the case of gender), but group members can advance hierarchically, for example, when a woman rises in the hierarchy of a male-dominated organization. Here group boundaries are also permeable as the group's resources can be accessed by outgroup members. This perception that group boundaries are permeable is an important determinant of ingroup attitudes and intergroup behavior (Tajfel, 1975). For example, when group boundaries are perceived as permeable, this can lower ingroup identification and increase intentions to join an outgroup (Ellemers, Van Knippenberg, & Wilke, 1990).

Despite the undisputed theoretical importance of permeability, researchers in the area of intergroup relations have not taken into account potential dimensions of permeability or systematic differences in permeability perceptions between social groups. In this article, we distinguish between two types of permeability: membership (i.e., changing groups) and status permeability (i.e., accessing resources of another group) that have, albeit implicitly, been central to the concept of permeability. Indeed, both have been used separately to operationalize permeability (cf. Hersby, Ryan, & Jetten, 2009; Wright, Taylor, & Moghaddam, 1990), yet without theoretical explication of their differences.

In addition, we stress the importance of assessing different types of constraints people may experience when assessing the *perceived* possibility of permeating group boundaries. These can be constraints imposed on one's ingroup (can my group permeate another group), on oneself (can I permeate another group), as well as whether or not changing groups *matches one's own values*. This is in line with Ellemers's (1993) definition of permeability as "an objective impossibility of changing group affiliations, *(that)* may also only be experienced as such because values that are central to their

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self-concept prevent people from freely moving from one group to another" (p. 32).

The goal of the current study was threefold: first, we sought to provide a conceptualization of permeability that differentiates between membership and status permeability. Second, we aimed to develop a scale that allows a comprehensive study of permeability perceptions across multiple social groups. Third, we sought to validate and apply the scale by examining mean levels and theoretical correlates of permeability perceptions across different types of social groups. Although applicable to any group, the concept of permeability is particularly relevant when studying attitudes and behaviors of group members who perceive that their group has a higher or a lower status than an outgroup. In the current study, we chose to focus on permeability perceptions of low (rather than high) status group members. Our choice was based on the observation that low status groups have received the bulk of research attention, with relatively robust findings on the role of permeability. Focusing on low status groups therefore allowed us to connect with the existing literature and to advance more sound predictions regarding construct and criterion validity. Note, however, that our scale was constructed in a manner that it can be applied to any social group. In the following, we provide a theoretical background of permeability by discussing its uses and conceptualizations in the extant literature. We then advance an integrated definition of permeability and present the development of our new scale and its application.

Importance of Permeability: Predicting Intergroup Attitudes and Behavior

Tajfel (1975) was among the first to propose that permeability is essential to understanding the types of actions group members would take in response to their low status group membership. This became part of social identity theory (SIT). According to SIT and in later theorizing, permeability constitutes one of the sociostructural characteristics that determine people's *attitudes* toward their own group (e.g., identification), toward outgroup members (e.g., derogation), and people's *behaviors* toward intergroup inequality (e.g., strategies to resolve or to maintain status quo).

Indeed, low levels of permeability perceptions are associated with higher levels of *identification* with the own group (Ellemers, Van Knippenberg, De Vries, & Wilke, 1988; Ellemers et al., 1990; but see Jackson, Sullivan, Harnish, & Hodge, 1996). Low status group members who perceive their group as less permeable are more focused on positive aspects of their own group and more likely to consider support of other ingroup members as a strategy for status enhancement (Hersby et al., 2009). High status group members who perceive their group as more permeable are more likely to derogate the low status group (i.e., showing prejudice) as a strategy to maintain the threatened status quo (Johnson, Terry, & Louis, 2005).

Importantly, permeability perceptions also determine the *behaviors* of low status group members. Specifically, SIT distinguishes two types of responses to intergroup inequality by low status group members, which are influenced by permeability: (a) *individual strategies*, aimed at improving the situation of the single individual, and (b) *collective strategies*, aimed at improving the situation of the group as a whole (Tajfel & Turner, 1979). When boundaries between groups seem permeable, individual strategies, particularly *individual mobility*, are preferred. In this case, members of low status groups seek to join the high status group. When the boundaries of the group are perceived as impermeable and individual advancement is not possible, collective strategies would be employed (Tajfel, 1975; Tajfel & Turner, 1979). Indeed, perceptions of impermeability are consistently associated with greater endorsement of collective (Jackson et al., 1996; Mummendey, Kessler, Klink, & Mielke, 1999) and lesser endorsement of individual strategies (Ellemers et al., 1990; Wright et al., 1990).

Importance of Permeability: Distinguishing Different Types of Social Groups

Although not a focus point of SIT, the concept of permeability could be used to assess differences between social groups. Theories in the areas of essentialism and group processes propose that social groups differ in features related to permeability, for example, whether groups have clear-cut (i.e., you're a member or not) or fuzzy boundaries, or how easy it is to change category membership (N. Haslam, Rothschild, & Ernst, 2000). Similarly, Lickel and colleagues (2000) introduced the concept of group entitativity, distinguishing *social categories* that are characterized by low permeability (e.g., gender, ethnic groups, age groups) from *transitory groups* characterized by high permeability (e.g., people waiting at a bus stop). Although there is clearly some conceptual overlap between essentialist and permeability approaches, we also see complementarity. Whereas essentialist approaches stress the collective perception of groups, previous conceptualizations of permeability stress the individual perspective. Yet, in line with essentialist approaches, a measure of permeability should also be able to capture differences between social groups regarding levels of permeability. This is an aspect that previous conceptualizations of permeability, which we turn to next, have so far neglected.

Previous Conceptualization

Two streams of literature can be identified that conceptualize permeability quite differently, mapping on to our distinction between membership and status permeability. The one, laboratory based, *manipulates* permeability either by creating artificial groups based on the minimal group paradigm (Ellemers et al., 1990; Jackson et al., 1996, Experiment 1;

Wright et al., 1990) or by giving information regarding the transience of the group (Jackson et al., 1996, Experiment 2). These studies conceptualize permeability as the possibility to become a *member of* another group. For example, participants are told that they are placed into a group and that in the course of the experiment the composition of groups can change (permeable condition) or cannot change (impermeable condition; Ellemers et al., 1988).

In another stream of literature, field studies *measure*, rather than manipulate, permeability perceptions of groups, as perceived by members of existent social categories. Such measures typically rely on the use of few items developed for the study in question, without determining the validity and reliability of the measure. These studies conceptualize permeability as the possibility of individual advancement and individually attaining a *higher status* (Hersby et al., 2009; Levin, Sidanius, Rabinowitz, Federico, & Rabinowitz, 1998; Van Laar, Sidanius, & Levin, 2008). Tajfel's (1975) definition of permeability or social mobility more closely reflects such status advancement: ". . . an individual's perception that he can improve his position in a social situation, or more generally, move from one position to another, as an individual" (p. 104). In this case, the status hierarchy is permeable or impermeable, without group members necessarily changing group membership. For example, Hersby and colleagues (2009) measured perceptions of permeability of professional women as their perceived possibility of obtaining a higher status within the organization (but see Mummendey et al., 1999 for an example of permeability measured as being physically perceived as a member of the higher status group).

So far, these two streams of literature have not been integrated. Findings on artificial groups created in laboratory settings are assumed to generalize to real-world social groups, as studied in field research. However, given that laboratory and field studies operationalize and conceptualize permeability differently, it remains unclear whether this assumption is valid. There are both convergent and divergent findings. One convergent finding is that both in experimental and field studies, higher levels of permeability are consistently associated with lower levels of collective action (e.g., Mummendey et al., 1999; Wright et al., 1990). A divergent finding is that in experimental groups, higher perceptions of permeability are related to higher levels of individual mobility (e.g., Lalonde & Silverman, 1994), whereas in field studies there is evidence of both negative and positive associations (e.g., Mummendey et al., 1999; Thai, Barlow, & Hornsey, 2013).

Toward a Definition and Operationalization of Permeability

Based on the above mentioned theorizing and operationalizations of permeability, we define permeability of group boundaries as *the perceived objective or subjective possibility of changing group membership, and/or of changing hierarchical status*. We thus incorporate the possibility of changing *group membership*, typically manipulated in experiments, and the possibility of changing *hierarchical status*, typically measured in field studies. Status permeability can involve accessing activities, power, rank, and/or resources that define the status of the outgroup and are usually denied to the ingroup.

Importantly, this definition includes not only permeability in the objective sense, but also, in line with SIT, the subjective component of permeability (Ellemers, 1993; Tajfel, 1974). Furthermore, it includes both permeability at the individual level (one can permeate the boundaries) and at the collective level (the collective can permeate the boundaries). Accordingly, within our two central dimensions of permeability (membership, status), we originally defined five subdimensions based on the different constraints that group members encounter when wanting to pass from one group to another. These constraints were identified on the basis of a review of the existent literature regarding conceptualizations and operationalizations of permeability: *objective constraints*—the outgroup or its determining characteristics are perceived as too distant and restricted (N. Haslam et al., 2000), *personal constraints*—lack of individual capacities prevents a group member from entering the outgroup (Mummendey et al., 1999; Tajfel, 1975), *value constraints*—personal values prevent the person from leaving the ingroup or entering the outgroup (Ellemers, 1993; Tajfel, 1974), *constraints imposed by the ingroup* and *constraints imposed by the outgroup*—the ingroup and/or the outgroup does not approve the mobilization between groups (Tajfel, 1974).

By taking into account these 10 subdimensions, we aimed to develop a comprehensive scale of permeability that can be applied to all social groups, whether group membership is transient or stable over longer periods of time. We expected this scale to be broadly applicable, to help distinguish different types of social groups, and to predict the endorsement of different types of intergroup attitudes and behavior, as suggested by theory and empirical findings. In the following sections, we outline the development of the permeability scale.

Scale Development and Validation

The permeability scale was developed according to a four-step procedure advocated by Hinkin (1998) plus three extra steps: Step 1, item generation; Step 2, exploratory factor analysis (EFA) and item reduction; Step 3, cluster analysis to derive a homogeneous clustering of the factors; Step 4, confirmatory factor analysis (CFA); Step 5, measurement invariance; Step 6, construct validity analyses in which we test the hypotheses that permeability predicts endorsement of different types of intergroup attitudes and behaviors; and, Step 7, application of the scale in which we test the hypothesis that innate and noninnate social groups differ in their perceptions of permeability. In the present section, we first describe the

Table 1. Samples Composition and Participants Demographics of Studies 1 and 2.

Target group (ingroup)	Contrast group (outgroup)	*M* age	*SD* age	% female	No. outliers[a]	Sample size	Specifics	Status differences (outgroup-ingroup)
					Study 1			
Older adults	Younger adults	51.97	8.39	56.7	7	164	40 years and older	−0.17 *ns*
Women	Men	28.07	7.91	100.0	7	180		1.01***
					Study 2			
Older adults	Younger adults	51.84	8.25	55.3	5	141	40 years and older	0.21 *ns*
Women	Men	26.41	6.06	100.0	2	138		1.26***
People with lower levels of education	People with higher levels of education	34.68	9.97	64.8	9	128	Participants with either no qualifications (4%), less than a high school diploma (22%), or no college degree (74%)	2.48***
African Americans	White Americans	33.6	11.07	61.1	2	90	Data of African Americans and Latino Americans was aggregated into the group of Ethnic Minorities	2.19***
Latino Americans	White Americans	31.05	9.76	38.2	0	55		1.82***
Obese people	Normal-weight people	29.69	5.43	53.7	5	67	BMI of 30 or higher (M_{BMI} = 36.26, SD_{BMI} = 5.94)	2.56***

Note. *ns* = not significant; BMI = body mass index.
[a]Participants were excluded from analyses based on the Mahalanobi's distance method for detecting multivariate outliers (Tabachnick & Fidell, 2001).
***$p < .001$.

participants and samples used for data collection. We then outline the permeability scale development following the analytical steps mentioned above.

Participants and Samples

Data were collected across two studies each including different social groups. Study 1 included *older adults* and *women* who participated via Amazon's Mechanical Turk (Mturk) for US$0.50. Study 2 included five social groups: *older adults, women, lower educated people, African Americans and Latino Americans*, and *obese people*,[1] who participated via Mturk for US$0.75. All participants were located in the United States. Assignment to the groups was achieved by asking participants a series of demographic screening questions. Unaware of the screening criteria, participants who met one of the specifics of the five groups were invited to complete the main questionnaire. Allocation of participants to groups was based on the following criteria: Older adults were participants aged 40 years and older based on the U.S. antiage discrimination law that protects applicants/employees aged older than 40 years; people with lower levels of education were participants with either no qualifications (4%), less than a high school diploma (22%), or no college degree (74%) based on research on educational levels as a social category (Kuppens, Easterbrook, Spears, & Manstead, 2015); and obese people were participants with a body mass index (BMI) of 30 or higher based on the international classification of overweight and obesity by the World Health Organization, and on previous research on overweight people as a social category (Alperin, Hornsey, Hayward, Diedrichs, & Barlow, 2014). Participants were first informed about their group assignment and were given the option to terminate the study if they disagreed with the classification or did not want to answer questions regarding this category. As an assessment of whether participants felt that their ingroup was of lower status relative to the outgroup, we asked them to rate the general overall status of both the ingroup and the outgroup on a scale from 1 (*low status*) to 7 (*high status*). Participants of all groups rated their ingroup as lower in status relative to the outgroup except older adults, whose ratings of ingroup and outgroup status did not differ.[2] Table 1 contains information about the Study 1 and 2 samples.

Step 1: Item Generation

We used both a deductive and an inductive approach to develop our initial set of items (Hinkin, 1998). Based on previous theoretical conceptualizations of permeability, we both adapted existing and created new items to measure the two main dimensions: *membership permeability*, the perceived possibility of changing group membership, and *status permeability*, the possibility of accessing the status and corresponding resources that are typical of the outgroup. Within these two dimensions, we developed items that measured the five possible constraints that could aid or hinder social mobility between social groups. As mentioned, these constraints could be objective (these items were based on the discreteness items of essentialism by N. Haslam et al., 2000), personal, value, imposed by ingroup, and imposed by outgroup. This resulted in 52 items rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). In both studies, items were presented to participants in random order within the *membership* and the *status* dimensions. The phrasing of

Table 2. Pattern/Scale Loadings and Communalities of EFA for Each of the Retained Items of the Developed Permeability Scale for the Group of Older Adults.

Item	Factor	Subdimension/item legend	Pattern	Structure	Communality (after rotation)
Membership permeability. Objective constraint					
1	4	[Ingroup] and [outgroup] are fundamentally different (-)	0.87	0.83	0.69
2	4	[Ingroup] and [outgroup] are worlds apart (-)	0.7	0.8	0.66
3	4	The difference between an [ingroup member] and an [outgroup member] is clear-cut (-)	0.61	0.69	0.53
Membership permeability. Personal constraint					
4	3	I can physically appear as an [outgroup member] if I want	0.92	0.83	0.74
5	3	No matter what effort I make, I will never be seen as an [outgroup member] (-)	0.82	0.87	0.78
6	3	I could be regarded as an [outgroup member] if I wanted to	0.83	0.85	0.73
7	3	There is nothing that I can do that can make me be considered as an [outgroup member] (-)	0.77	0.82	0.7
Membership permeability. Value constraints					
8	1	Passing myself off as an [outgroup member] goes against my values (-)	0.8	0.83	0.74
9	1	Wanting to appear as an [outgroup member] goes against who I am (-)	0.71	0.83	0.76
10	1	Wanting to be treated as an [outgroup member] goes against my beliefs (-)	0.71	0.81	0.72
Status permeability. Objective constraint					
11	5	It is physically possible for some [ingroup members] to do all the activities that [outgroup members] can do	0.7	0.68	0.49
12	5	Some [ingroup members] have at least the same physical capacities that [outgroup members] have	0.79	0.78	0.63
13	5	It is physically possible for some [ingroup members] to access the same positions in society as [outgroup members]	0.5	0.57	0.37
Status permeability. Personal constraint					
14	6	No matter what effort I make, I cannot access the same resources that an [outgroup member] can access (-)	0.86	0.84	0.74
15	6	The truth is, I can do very little to access resources that [outgroup members] typically have access to (-)	0.84	0.88	0.79
Status permeability. Value constraints					
16	1	Occupying positions in society that are typical of [outgroup members] goes against my values (-)	0.77	0.67	0.55
17	1	Accessing resources that are typical of [outgroup members] is against who I am (-)	0.66	0.64	0.51
18	1	Doing activities that are typical of [outgroup members] goes against my principles (-)	0.72	0.68	0.53

Note. (-) refers to items that need to be reverse coded. Eigenvalues with their corresponding percentage of variance explained were 8.22 (31.62%) for Factor 1, 2.19 (8.41%) for Factor 3, 1.86 (7.16%) for Factor 4, 1.31 (5.04%) for Factor 5, and 1.13 (4.34%) for Factor 6. Items were adjusted depending on the social group. For example, Item 1 for the different groups read, "Older adults and younger adults are fundamentally different," "Women and men are fundamentally different," "People with lower levels of education and people with higher levels of education are fundamentally different," "African American and White Americans are fundamentally different," "Latinos and White Americans are fundamentally different," and "Obese people and normal-weight people are fundamentally different." EFA = exploratory factor analysis.

the items was adapted depending on the social group in question (see Table 2 for final items).[3]

Step 2: Exploratory Factor Analyses and Initial Item Reduction

This step made use of the Study 1 data. The first stage of item reduction was based on statistical considerations: We examined the interitem correlations and deleted three items that correlated less than .40 with all other items in both groups, and two more items that correlated less than .40 in the group of older adults (Hinkin, 1998).

We then conducted EFAs using principal axis factoring with Promax rotation (Russell, 2002). EFAs were iterated with item reduction taking into account three criteria for item retention (Hinkin, 1998): To retain items that most clearly

represented the underlying construct, we removed those items that loaded lower than .40 on the intended factor (Criterion 1) or that loaded with a difference of less than .20 on two factors (Criterion 2). Furthermore, we removed items with communalities below .30 (Criterion 3). This process was carried out simultaneously for both groups, older adults and women. Thus, in each iteration, items were excluded when they met at least one of three exclusion criteria for at least one group, and we applied a new EFA within each group every time we reduced the number of items. Through the iterative process, 26 items were excluded.

The resulting scale consisted of 26 items. In the group of older adults, the 26 items loaded on seven factors with eigenvalues greater than 1. As mentioned, we had expected items to load on 10 subdimensions: 2 (membership, status) × 5 (objective, personal, value, imposed by ingroup, and imposed by outgroup constraints). We obtained three factors less than expected because the value constraints of both dimensions loaded on the same factor, and the constraints imposed by ingroup of the membership dimension and the constraints imposed by outgroup for both dimensions loaded on the same factor. The seven-factor solution accounted for 71.42% of the overall variance (see Table 2 for loadings and communalities of the final items). In the group of women, the 26 retained items loaded on six factors with eigenvalues greater than 1 and accounting for 68.4% of the overall variance. We obtained one factor less than in the group of older adults because the constraints imposed by ingroup and by outgroup for both dimensions loaded on the same factor.

Step 3: Cluster Analysis

Cluster analysis organizes the data into meaningful clusters based on similarity. Given that we did not find an identical factor structure for both groups, we performed a hierarchical cluster analysis on the data from both studies to obtain a homogeneous and simplified grouping of the proposed subscales that was applicable across groups (Burns & Burns, 2008). Cluster analysis was done using Ward's method, and applying squared Euclidean Distance as the measure of distance. The variables used for this analysis were the 10 theoretical subscales combined for both groups in Study 1 and for the five groups in Study 2.

Results suggested a grouping of variables into three clusters: Cluster 1 included objective, personal, and value constraints defining *membership permeability*. Cluster 2 included objective, personal, and value constraints defining *status permeability*. Cluster 3 included constraints imposed by ingroup and outgroup of both membership and status permeability defining *social permeability*. The three-cluster solution was robust across groups and grouped variables in a sound three subdimension division—membership permeability (Cluster 1), status permeability (Cluster 2), and social permeability (Cluster 3)—which we retained for the next step of scale development.

Step 4: CFAs

To obtain the best model across groups, we performed CFA using the data of both studies. We assessed model fit by considering the following commonly used indices (Hu & Bentler, 1999; Kline, 1998): The chi-square (χ^2) divided by its degrees of freedom, where a ratio below 3 indicates that the model fits the data well, the comparative fit index (CFI) that indicates how much better the model is compared with a null-model—where variables are assumed to be unrelated—(should be higher than .95), the root mean square error of approximation (RMSEA) that indicates the badness of fit of the model in the population (should be less than .08), the standardized root mean square residual (SRMR; should be less than .08), and the Bayesian information criterion (BIC; when comparing models a smaller BIC value indicates a better trade-off between fit and complexity). Furthermore, we used the Satorra–Bentler test for model goodness of fit versus the saturated model, which is robust to nonnormality. The Lavaan (Version 0.5-17) package in R for Windows (Version 3.2.0) was used for these analyses.

We tested two models based on the previous steps. A first model was based on the division suggested by the cluster analysis; it included all 26 items obtained after the EFAs and assigned these to membership, status, and social permeability (Model 1; see Figure 1a). Inspection of the correlations between the three factors showed that the third factor had mostly low or nonsignificant correlations with the other two factors. Therefore, we performed CFA on a second model based on only two factors, the membership and the status permeabilities, excluding the eight items that assessed social permeability (Model 2; see Figure 1b). Model 1 had poor fit indices, particularly for the groups of lower educated and obese. Model 2, however, had good fit indices across all groups, except for slightly low CFI levels in the lower educated and the ethnic minority groups, and the SRMR for ethnic minorities. Model 2 was thus the preferred model, consisting of 18 items (see Table 3).

Means, standard deviations, reliabilities, and correlations of Model 2 and its subdimensions are reported in Table 4 for all groups in both studies. The total scale and its two dimensions had adequate reliabilities for all groups and studies (α = .66-.90). Importantly, the correlation between membership and status permeability was positive and moderate for most groups. This suggests the scale has discriminant validity as items that measured distinct factors proved to be discernible from each other (see Step 6 for our measures of discriminant validity). An exception was the group of ethnic minorities in which membership and status permeability were uncorrelated. This may indicate a tendency of this group to perceive

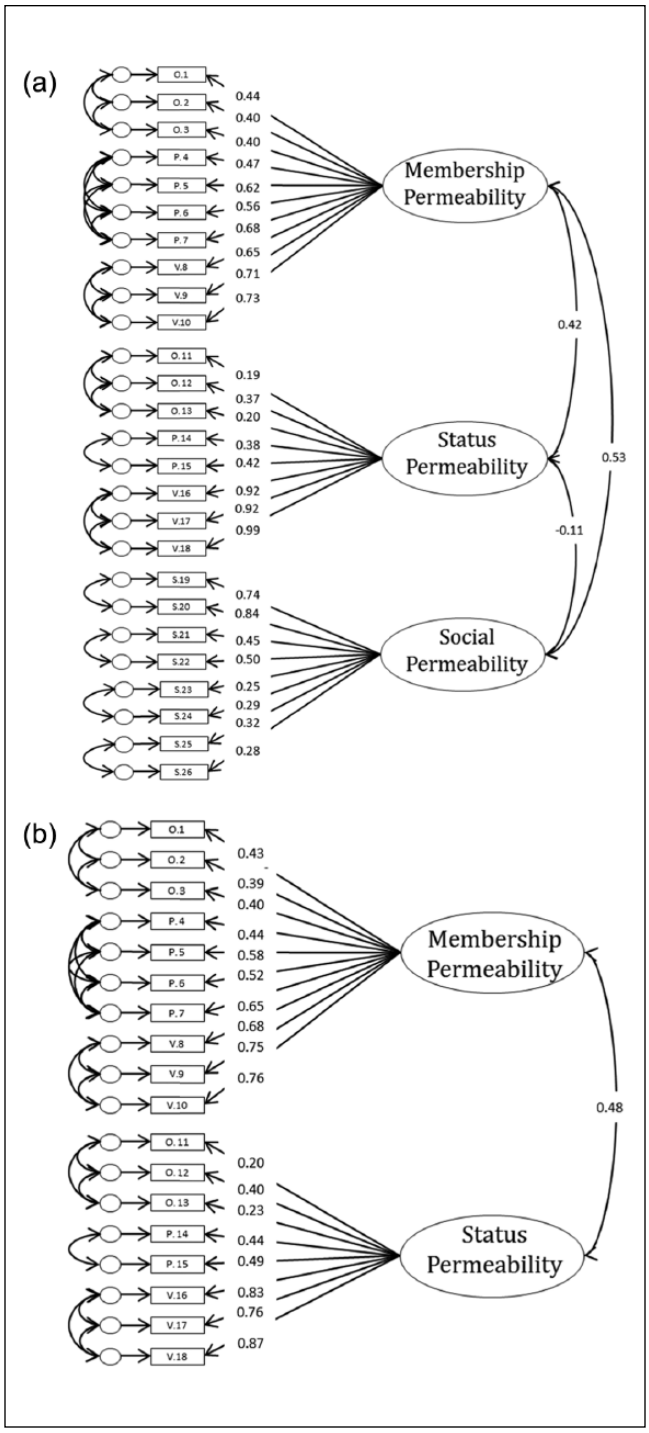

Figure 1. Alternative models for different configurations of the proposed permeability scale with item loadings of all groups in Study 2.

Note. (a) Model 1 corresponds to a three-factor solution based on membership, status, and social permeability. (b) Model 2 corresponds to a two-factor solution based on membership and status permeability. Both models allow the errors within the same type of constraint to covary. Social constraints comprise both membership and status related items, as well as ingroup and outgroup constraints. O = objective constraints; P = personal constraints; V = value constraints; S = social constraints.

the two forms of permeability as orthogonal: Ethnic minorities' perception that they may or may not pass up as member of the high status group may go along with either a high or low perceived chance of status advancement.

In sum, by selecting Model 2 above Model 1, we chose a stricter conceptualization of permeability that better fits a broader range of social groups. Indeed, although fear of social sanctions has been considered a part of the concept of permeability (Tajfel, 1974), our results reveal that a model that includes items measuring perceived social constraints does not provide a good fit across groups. We still consider social constraints meaningful in explaining people's perceptions of mobility between social groups. However, this type of constraint may not apply to all groups or may constitute another construct that is related to but distinct from permeability.

Step 5: Measurement Invariance

This step assessed whether our scale measures the same constructs across groups, in other words, whether participants in different groups interpret the scale similarly. Only then are we able to make comparisons across groups regarding participants' perceptions of permeability. To determine whether the developed scale is measurement invariant, we ran four structural equation models using Lavaan (Version 0.5-17). Each of the four models was run separately for the two studies.

Models varied in their constraints: Model A did not impose equality constraints to factor loadings, intercepts, or residuals. This model merely tested whether the factor structure was similar across groups (*pattern invariance*). Model B constrained the factor loadings to be equal across groups while the other parameters were allowed to differ. This model tested whether participants across groups attributed the same meaning to the two assessed dimensions of permeability (*metric invariance*). Model C constrained the loadings and intercepts to be equal across groups. This model tested whether respondents attributed the same meaning to permeability, as does Model B, and also whether the levels of the underlying items (intercepts) were equal across groups (*scalar invariance*). When this is the case, we can compare mean differences across groups. Model D constrained factor loadings, intercepts, and residuals to be equal across groups. This model tested whether the explained variance for every item was the same across groups (*full uniqueness*). If this test is not supported, group means can still be compared on the latent variable but this is measured with a different amount of error across groups (Van de Schoot, Lugtig, & Hox, 2012).

Table 5 shows the indices of model fit of the four models mentioned above and for both studies.[4] For Study 1, the four models had good fit indices, while for Study 2 Models C and D had CFI and RMSEA indices slightly below the threshold. However, for both studies, Model D had the lowest BIC value. This indicates that this model fitted the data best as it had the best trade-off between model complexity

Table 3. Model Fit of Competing Models for Permeability Across Groups in Studies 1 and 2.

Group	Model	χ^2	*df*	χ^2/df	CFI	BIC	RMSEA	SRMR
				Study 1				
Older adults	1	325.53	273	1.19	0.97	12,746.23	0.03	0.07
	2	140.68	115	1.22	0.98	9,122.91	0.04	0.05
Women	1	464.36	275	1.69	0.91	15,272.47	0.06	0.10
	2	164.54	115	1.43	0.97	10,988.55	0.05	0.07
				Study 2				
Older Adults	1	397.84	273	1.46	0.93	10,796.37	0.06	0.09
	2	147.39	115	1.28	0.97	7,578.32	0.05	0.07
Women	1	417.73	273	1.53	0.91	11,686.62	0.06	0.10
	2	150.94	115	1.31	0.97	8,227.56	0.05	0.06
Low educated	1	418.01	273	1.53	0.87	10,756.98	0.06	0.09
	2	177.68	115	1.55	0.92	7,450.50	0.07	0.07
African American	1	407.61	275	1.48	0.91	13,146.01	0.06	0.11
+ Latinos	2[a]	196.29	117	1.68	0.93	9,156.69	0.07	0.10
Obese	1[a]	347.51	273	1.27	0.88	5,845.22	0.06	0.11
	2[a]	129.67	117	1.11	0.97	4,002.50	0.04	0.08

Note. Model 1 corresponds to a three-factor solution based on membership, status, and social permeability. Model 2 corresponds to a two-factor solution based on membership and status permeability. Both models allow the errors within the same type of constraint to covary. CFI = comparative fit index; BIC = Bayesian information criterion; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.
[a]Due to the occurrence of inadmissible solutions, we removed the residual correlation for one item in the status factor.

Table 4. Reliabilities and Descriptives of Membership Permeability, Status Permeability, and Total Permeability of All Groups in Studies 1 and 2.

Group	Dimension	α	*M*	*SD*	Correlation membership-status dimensions
		Study 1			
Older adults	Membership	.89	4.03	1.12	.59***
	Status	.79	5.09	0.84	
	Total	.90	4.50	0.90	
Women	Membership	.89	3.64	1.32	.40***
	Status	.81	5.37	0.98	
	Total	.89	4.41	0.99	
Aggregated groups Study 1	Membership	.89	3.83	1.24	.44***
	Status	.81	5.24	0.92	
	Total	.89	4.45	0.95	
		Study 2			
Older adults	Membership	.88	3.79	1.08	.53***
	Status	.85	5.19	0.84	
	Total	.90	4.42	0.86	
Women	Membership	.90	3.80	1.38	.39***
	Status	.77	5.64	0.79	
	Total	.88	4.62	0.96	
Low educated	Membership	.81	4.88	0.91	.61***
	Status	.77	5.21	0.89	
	Total	.86	5.02	0.81	
Ethnic minorities	Membership	.84	3.45	1.25	.13
	Status	.79	5.62	0.99	
	Total	.81	4.41	0.87	
Obese	Membership	.66	4.97	0.82	.48***
	Status	.82	5.50	0.98	
	Total	.81	5.21	0.77	
Aggregated groups Study 2	Membership	.87	4.07	1.28	.28***
	Status	.80	5.43	0.91	
	Total	.86	4.67	0.91	

***$p < .001$.

Table 5. Model Fit of Increasingly Constrained Models to Assess Measurement Invariance Across Groups in Study 1 and Study 2.

Model	χ^2	*df*	χ^2/df	CFI	RMSEA	BIC
			Study 1			
A	346.78	230	1.51	0.96	0.05	20,682.84
B	370.41	246	1.51	0.96	0.05	20,613.02
C	448.74	262	1.71	0.94	0.06	20,597.91
D	495.87	280	1.77	0.93	0.07	20,539.90
			Study 2			
A	775.70	468	1.66	0.94	0.07	33,782.71
B	874.05	516	1.69	0.93	0.07	33,578.00
C	1,108.15	564	1.96	0.89	0.08	33,509.06
D	1,398.75	618	2.26	0.84	0.10	33,458.72

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; BIC = Bayesian information criterion.

and amount of variance explained. Looking more closely at the fit indices, we can conclude that there is evidence of scalar invariance in Study 1 and we can therefore safely compare the means across these groups. In Study 2, however, we found evidence of metric invariance, but as the fit of Model C dropped considerably, there was less evidence of scalar invariance. We can therefore proceed to compare the mean permeability of the groups of older adults and women (Study 1), but we should be more cautious when comparing mean levels of permeability of lower educated, ethnic minorities and obese.

Step 6: Construct Validation

This step assessed whether the scale is associated with constructs as predicted by theory and previous findings.

Table 6. Correlations Between Permeability and Main Theoretical Correlates for Studies 1 and 2 to Assess Convergent, Discriminant, and Criterion-Related Validity.

Dimension	Ingroup–outgroup overlap	Global permeability	Meritocracy	Self-efficacy	Ingroup identification	Outgroup identification
			Study 1			
Membership	.35***				−.39***	.29***
Status	.34***				−.08	.10†
Total	.40***				−.32***	.26***
			Study 2			
Membership	.33***	.29***	−.01	−.01	−.27***	.37***
Status	.25***	.26***	.06	.25***	−.09*	.15***
Total	.36***	.33***	.02	.11**	−.24***	.34***

†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Specifically, we considered whether the scale correlates with measures that are designed to assess similar constructs (convergent validity), does not correlate with measures that are designed to measure different concepts (discriminant validity), and whether it predicts outcomes as suggested by theory (criterion-related validity; Hinkin, 1998).

In the following, we further describe each of these types of validity, introduce the measures used to assess them, and report the results. Unless indicated otherwise, scale endpoints ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items are given for ingroup versus outgroup. Phrasing was adapted for the groups by modifying the name of ingroup and outgroup as presented in Table 1. We aggregated items into scales for analyses. Furthermore, unless results required an analysis of individual groups, data of the groups was aggregated for each study.

Does the scale correlate with similar measures? Due to the lack of an established permeability measure, we assessed convergent validity with two related measures: Assessment of ingroup–outgroup overlap, administered in Studies 1 and 2, and a one-item measure of permeability, administered in Study 2. Furthermore, we assessed whether group-specific constructs related to permeability: age (for older adults), levels of education (for the lower educated), and BMI (for the obese).

Ingroup–outgroup overlap. This measure assesses the perceived proximity of ingroup and outgroup by means of a graphical representation, where the two groups are represented by two circles of equal size that vary in their proximity. This measure is related to permeability insofar as it assesses perceived similarity, closeness, intimacy, entitativity, and shared category membership of groups (Schubert & Otten, 2002). Indeed, previous studies have understood the pictorial scale of overlapping circles as a measurement of boundary permeability between groups (Buhrmester et al., 2012). The measure was introduced as follows: "When you think about the relationship between [ingroup] and [outgroup], which of these pictures best describes your thoughts?" rated from 1 (*circles are most distant from each other*) to 7 (*circles are almost completely overlapping*). We expected higher ratings of membership and status permeability to relate to greater perceptions of ingroup and outgroup overlap.

Global permeability perception. Participants were asked to rate their agreement with one item created for the purpose of assessing a global perception of permeability between groups: "The boundaries between the [ingroup] and the [outgroup] are rigid" (item was reverse coded). This item was based on the most generalized definition of permeability as assessed in previous research in the area of group processes (Lickel et al., 2000). We expected ratings of both membership and status permeability to relate positively to perceptions of global permeability.

Age, levels of education, and BMI. Previous research has assumed that advanced age is associated with lower perceived permeability of the group of older adults (Garstka, Schmitt, Branscombe, & Hummert, 2004). Although this assumption has not been empirically tested, we consider it plausible. Moreover, one can expect that for the group of lower educated, lower levels of education are associated with lower levels of perceived permeability. For the group of obese, higher BMI should be related to lower levels of perceived permeability. To test these assumptions, we used demographics of participants in Study 2.

Results and discussion. Our scale showed good convergent validity. Both membership and status permeability correlated positively with the visual measure of ingroup and outgroup overlap in both studies. Both dimensions of permeability were also positively correlated with global perceptions of permeability in Study 2 (see Table 6). Moreover, as expected, there was a negative correlation between both dimensions of permeability and age in the group of older adults and a positive correlation between both dimensions of permeability and level of education in the group of lower educated. A marginal negative correlation was found between the membership dimension of permeability and BMI in the group of obese (see Table 7). These results provide support for the convergent validity of our scale.

Table 7. Correlations Between Perceptions of Permeability and Individual's Defining Membership Characteristic for Older Adults, Lower Educated, and Obese.

Group	Dimension	Age	Level of education	BMI
	Study 1			
Older adults	Membership	−.30***		
	Status	−.23**		
	Total	−.31***		
	Study 2			
Older adults	Membership	−.38***		
	Status	−.18*		
	Total	−.35***		
Low educated	Membership		.22*	
	Status		.21*	
	Total		.24**	
Obese	Membership			−.23†
	Status			.11
	Total			−.08

Note. BMI = body mass index.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Does the scale correlate with related but distinct measures? As we outline below, we assessed here whether permeability is distinct from measures of meritocracy and self-efficacy, administered in Study 2. Low correlations between both forms of permeability and each of these measures would indicate discriminant validity.

Meritocracy. This construct is related to permeability in that it refers to the possibility of individual "movement" into a high status group. However, in contrast to permeability, such movement should not be dependent on the social structure at hand but should solely be based on individual merit (Jost, Pelham, Sheldon, & Sullivan, 2003). Despite these differences, meritocratic beliefs have been used to measure system permeability (Levin et al., 1998; Van Laar et al., 2008). We expected meritocracy to show weak (positive) correlations with permeability. To measure meritocracy, we adapted the four items of McCoy and Major (2007), for example, "Most people who don't get ahead should not blame the system; they really have only themselves to blame" ($\alpha = .74$).

Self-efficacy. This construct refers to a sense of personal competence and capacity to cope with life stressors and is associated with higher achievement (Scholz, Gutiérrez Doña, Sud, & Schwarzer, 2002). It is related to permeability in that it should be indicative of perceived possibilities of personal advancement. Previous research has linked group-efficacy (as a form of self-efficacy) to collective strategies used by low status group members (Mummendey et al., 1999). Self-efficacy should be distinct from permeability as it does not take into account restraints or possibilities of advancement provided by the social structure. Therefore, we expected self-efficacy to show weak (positive) correlations with permeability. Participants indicated the extent to which six self-efficacy-related statements were true to them, for example, "If someone opposes me, I can find the means and ways to get what I want" ($\alpha = .87$; Scholz et al., 2002).

Results and discussion. As expected, meritocracy did not correlate with any of the subdimensions of permeability (see Table 6). This suggests it may be problematic to operationalize meritocracy as a proxy to system permeability, as previous work has done (e.g., Levin et al., 1998; Van Laar et al., 2008). Yet, there may be groups for whom these concepts overlap more strongly, such as those defined by economical stratification.

Self-efficacy was not correlated with membership permeability but was positively correlated with status permeability. This difference could be due to status permeability relying more strongly on the feeling that one has the ability and the personal tools to achieve higher status in society (although apparently not via meritocratic means). In contrast, membership permeability may depend more on external group-related features, such as one's biology (e.g., gender, ethnicity). We come back to this in the "General Discussion" section. Overall, results for meritocracy and self-efficacy confirm the scale's discriminant validity, albeit somewhat more strongly for membership than status permeability.

Does the scale predict outcomes as suggested by theory? To assess criterion validity, we measured identification with the ingroup and with the outgroup in Studies 1 and 2, and endorsement of individual and collective strategies in Study 2.

Identification with the ingroup and outgroup. In line with SIT, previous research reveals that higher perceptions of permeability are associated with lower levels of ingroup identification (Ellemers et al., 1988; Mummendey et al., 1999). Therefore we expected the two dimensions of permeability to be negatively correlated with ingroup identification and positively with outgroup identification. In Study 1, ingroup identification was assessed with 14 items adapted from Leach et al. (2008), for example, "The fact that I am an [ingroup member] is an important part of my identity" ($\alpha = .93$).

In Study 2, ingroup identification was assessed via three items adapted from Leach et al. (2008), for example, "I identify with the [ingroup]" ($\alpha = .88$). Outgroup identification was assessed in both Studies 1 and 2 by means of one item from Postmes, Haslam, and Jans (2012): "I identify with the [outgroup]."

Individual versus collective action endorsement. Previous research has revealed that when permeability is perceived to be high, members of low status groups favor individual (mobility) over collective (action) strategies. When permeability is perceived to be low, they favor collective over individual strategies or favor both equally (Lalonde & Silverman, 1994; Wright et al., 1990). To demonstrate the new scale's criterion-related validity, we aimed to replicate these

strategy preferences. Note that these studies measured what we define as membership permeability; our analyses for status permeability were therefore exploratory. *Individual mobility* (the most commonly measured individual strategy) was assessed with four items adapted from Tausch, Saguy, and Bryson (2015; for example, "I work hard to achieve higher level positions in society"; α = .74). Endorsement of *collective action* (the most commonly measured collective strategy) was assessed by asking participants to what extent they found four actions important to undertake based on Derks, Van Laar, and Stroebe (2016), for example, "Work toward ensuring that [ingroup] have the same opportunities as [outgroup] in society" (α = .89).

Results and discussion. As expected, both dimensions of permeability were negatively correlated with ingroup and positively correlated with outgroup identification across samples (see Table 6). These correlations with ingroup and outgroup identification were stronger for membership than status permeability. This suggests that perceptions of membership, compared with status permeability are more strongly associated with outgroup versus ingroup connectedness. Yet, the pattern of results was as predicted for status permeability: Using Fisher's transformation, z tests revealed a significant difference in correlations of ingroup identification and status permeability and outgroup identification and status permeability, both in Study 1 ($z = -1.98$, $p = .026$) and Study 2 ($z = -3.96$, $p < .001$).

For the analysis of endorsement of individual or collective action, we performed an ANCOVA analysis using data of Study 2, with type of action endorsement (individual, collective) as within-subjects factor and permeability as the continuous moderator or covariate. In this analysis, a significant interaction between type of action endorsement and permeability would indicate that the *relative* endorsement of individual versus collective strategies differs as a function of permeability. We performed separate analyses for membership and status permeability. For membership permeability, results showed a significant interaction effect between permeability and type of strategy endorsement, $F(1, 612) = 7.10$, $p = .008$, $\eta^2_{partial} = .01$. In line with expectations, follow-up analyses indicated that when individuals perceived membership permeability as high (1 *SD* above the mean), they endorsed individual over collective action, $F(1, 612) = 11.38$, $p = .001$, $\eta^2_{partial} = .02$. However, when individuals perceived membership permeability as low (1 *SD* below the mean), they endorse individual and collective action equally, $F(1, 612) = 0.15$, $p = .695$, $\eta^2_{partial} = .00$ (see Figure 2a). Likewise, results showed a significant interaction effect of status permeability and type of strategy endorsement, $F(1, 612) = 4.17$, $p = .041$, $\eta^2_{partial} = .01$. Specifically, when individuals perceived status permeability as high, they endorsed individual over collective action, $F(1, 612) = 8.59$, $p = .004$, $\eta^2_{partial} = .01$. However, when individuals perceived status permeability as low, they endorse individual and collective action equally, $F(1, 612) = 0.00$, $p = .967$, $\eta^2_{partial} = .00$ (see Figure 2b). These results replicate prior work for membership permeability (Lalonde & Silverman, 1994) and reveal status permeability to be comparable regarding action endorsement. Overall, the results for identification and individual versus collective strategy endorsement thus support the scale's criterion-related validity.

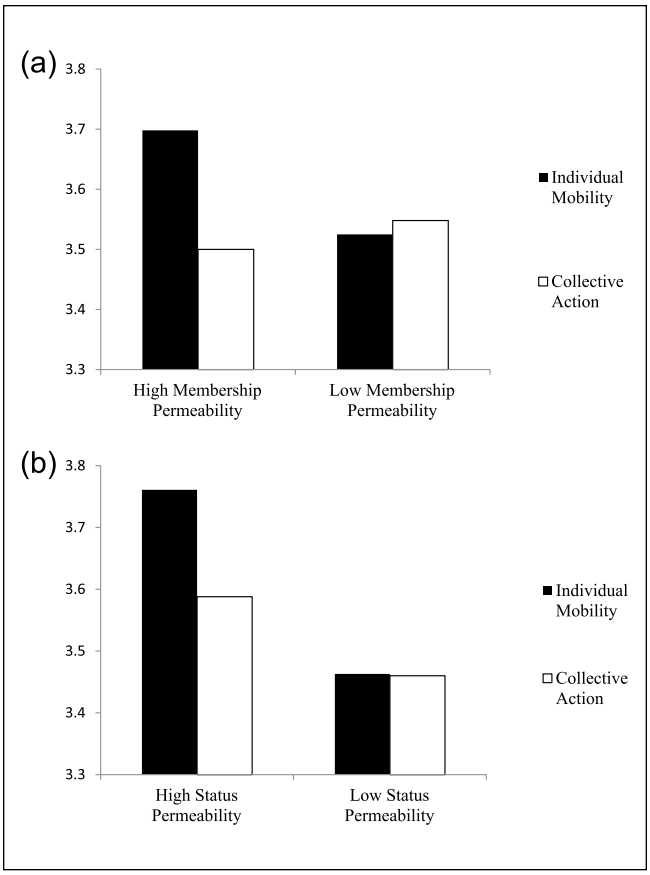

Figure 2. Individual versus collective action endorsement as a function of (a) membership and (b) status permeability. Scale endpoints range from 1 to 5.

Step 7: Application of the Scale to Compare Groups

As a final step, we compared perceptions of permeability across different social groups, in line with the postulate of essentialist approaches that social groups differ in permeability perceptions. We administered our scale to five social groups that were expected to differ in their perceptions of permeability. For three groups in our study, category membership is biologically determined or innate, making membership access to another group impossible or extremely difficult at best: older adults,[5] women, and ethnic minorities. For the two remaining groups, obese and lower educated people, category membership is acquired and changeable, thus making membership access feasible. Accordingly, we hypothesized that the "innate" groups would score lower on membership permeability than the "noninnate" groups. At the same time, they

Table 8. Mean Differences of Permeability and Permeability Subdimensions Between Groups in Study 2.

		Membership permeability		Status permeability		Total permeability	
Group (I)	Group (J)	Mean difference (I-J)	*SE*	Mean difference (I-J)	*SE*	Mean difference (I-J)	*SE*
1. Ethnic minorities	2	−0.35	.13	0.43*	.11	−0.00	.10
	3	−0.36	.14	−0.02	.11	−0.21	.10
	4	−1.53*	.17	0.12	.13	−0.80*	.13
	5	−1.43*	.14	0.41*	.11	−.61*	.10
2. Older adults	1	0.35	.13	−0.43*	.11	0.00	.10
	3	−0.01	.14	−0.44*	.11	−0.20	.10
	4	−1.18*	.17	−0.31	.13	−0.79*	.13
	5	−1.08*	.14	−0.02	.11	−0.61*	.11
3. Women	1	0.36	.14	0.02	.11	0.21	.10
	2	0.01	.14	0.44*	.11	0.20	.10
	4	−1.17*	.17	0.14	.13	−0.59*	.13
	5	−1.07*	.14	0.42*	.11	−0.41*	.11
4. Obese	1	1.53*	.17	−0.12	.13	0.80*	.13
	2	1.18*	.17	0.31	.13	0.79*	.13
	3	1.17*	.17	−0.14	.13	0.59*	.13
	5	0.10	.17	0.29	.13	0.18	.13
5. Lower educated	1	1.43*	.14	−0.41*	.11	0.61*	.10
	2	1.08*	.14	0.02	.11	0.61*	.11
	3	1.07*	.14	−0.42*	.11	0.41*	.11
	4	−0.10	.17	−0.29	.13	−0.18	.13

*$p < .05$.

may score higher on status permeability. That is because the groups of obese and lower educated people have a shorter and less pervasive history of fighting against inequality than the groups of women and ethnic minorities, with older adults being in between. As a result, laws and social norms now widely exist, which have facilitated the (perceived) access of women and ethnic minorities to higher social status positions and, to a lesser extent, of older adults. Yet, no such laws exist for obese and lower educated persons.

Group comparisons applying Bonferroni correction in Study 2 showed that, as hypothesized, the lower educated and the obese rated membership permeability higher than women, older adults, and ethnic minorities (see Table 8 and Figure 3). Although average status permeability ratings were relatively high for all groups, status permeability was, as expected, rated significantly higher by women and ethnic minorities than by older adults and the lower educated. In sum, our findings point to the ability of our scale to assess between-group differences in perceptions of membership versus status permeability.

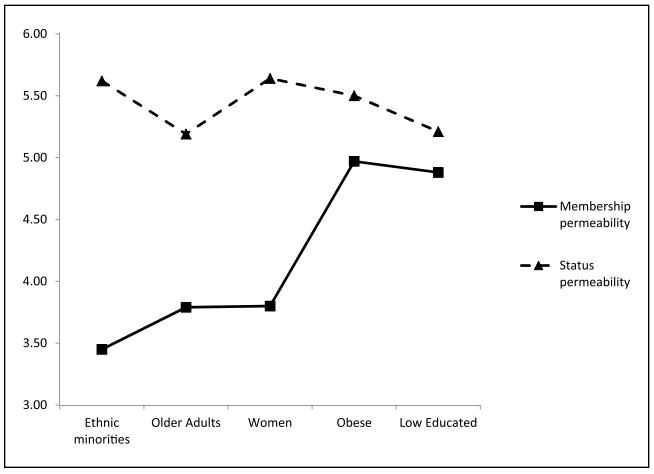

Figure 3. Means of membership and status permeability for all groups in Study 2.
Note. Scale endpoints range from 1 to 7.

General Discussion

Permeability of group boundaries is a key concept in explaining and understanding intergroup relations, such as ingroup and outgroup identification and behavioral reactions to intergroup inequality. Despite its theoretical and practical relevance, such as for examining conditions that elicit intergroup conflict (Ellemers et al., 1988), there is to date no validated measure of permeability. Consequently, permeability has been conceptualized and operationalized in a multitude of ways, which hampers the interpretation and integration of

empirical findings (e.g., Hersby et al., 2009; Lalonde & Silverman, 1994).

Conceptualization of Permeability and Applicability of the Scale

The present work aims to fill this gap by providing a conceptualization of permeability that integrates different approaches in the literature—those focusing on artificially created groups and manipulating levels of permeability and those focusing on existent groups and measuring permeability of group boundaries. Based on the theoretical background of permeability outlined in SIT (Tajfel, 1975) and an integration of the different operationalizations found in the literature, we proposed a distinction between two forms of permeability. One can join a group by actually becoming a member of it: this we call *membership permeability*, such as a Black person who has his or her skin lightened to become (more) White. One can also cross group boundaries by making a status hierarchical advancement, which we call *status permeability* (e.g., Van Laar et al., 2008), such as a Black person who gains high status within a predominantly White organization. Our work provides strong support for this bidimensional structure consisting of membership and status permeability, as is also evidenced by good model fit for five different social groups across two different studies.

Predicting Intergroup Attitudes and Endorsement of Behavior

Importantly, our permeability measure is related to central indicators derived from SIT and a wide range of studies in the area of intergroup relations (Ellemers et al., 1990; Lalonde & Silverman, 1994): the attitudes members of low status groups hold with regard to their own and the high status group, as well as their endorsement of different types of behavior in response to low status. Membership and, to a lesser extent, status permeability were associated with a decrease in ingroup and increase in outgroup identification. Moreover, as expected, membership and status permeability were related to greater endorsement of individual over collective actions. In contrast, when permeability perceptions were low, both types of strategies were endorsed equally. We thus conclude that both status and membership permeability relate to central indicators of intergroup relations.

It is important to note some unexpected but potentially interesting differences between status and membership permeability. Of the two types of permeability, only status permeability correlated with self-efficacy. At the same time, status permeability correlated with ingroup and outgroup identification less strongly than did membership permeability. This may suggest that the two types of permeability signal different group connections (and possibly also different behaviors). Membership permeability may be more strongly related to, and dependent on, feelings of attachment to one's group, whereas status permeability may be more strongly related to the desire or need for additional resources of the outgroup, in part reliant on personal efficacy (see also Mummendey et al., 1999). Although additional empirical work is needed to draw firm conclusions, these initial results do support the utility of distinguishing between status and membership permeability.

Distinguishing Different Types of Social Groups

Work in the area of intergroup relations generally considers all low status groups to be comparable. In line with research in the area of essentialism and group processes (N. Haslam et al., 2000; Lickel et al., 2000), our work stresses the added value of distinguishing groups along the membership and status dimensions of permeability. We classified two different types of groups and compared their permeability perceptions: groups whose membership is innate or unchangeable (in our case, older adults, women, and ethnic minorities) versus noninnate or changeable (in our case, obese and the lower educated). The noninnate groups had higher perceptions of membership permeability than the innate groups. Vice versa, the innate groups (women and ethnic minorities) had the highest perceptions of status permeability. Our work supports the added value of taking into account differential perceptions of permeability across different types of groups. This point is exemplified by one of the few studies looking at intergroup contact between noninnate rather than innate groups, in this case overweight people (Alperin et al., 2014). The positive effects of intergroup contact on intergroup attitudes applied to a lesser extent for the group of overweight. This can be explained by the fact that the group of overweight is considered permeable and thus threatening to people who are not overweight. Thus perceptions of permeability can alter the positive effects of intergroup contact, which are generally found in innate groups.

Taken together, both this empirical work and our conceptual distinction between status and membership permeability suggests the importance of taking into account differences in attitudes and endorsement of behavior toward low status groups as a consequence of type of permeability perception.

Future Directions

The present work also suggests future avenues for the study of social change (i.e., "upgrading the status position of the ingroup as a whole"; Ellemers et al., 1990, p. 233). Whether social change is even possible, and what the opportunities for social change are, may depend on the type of permeability individual group members and different social groups perceive. Note that here lies potential to study how different types of social groups that vary in levels of membership and status permeability perceive opportunities for social change.

For those who have low perceptions of the membership permeability of their group (e.g., members of ethnic minority groups), perceptions of status permeability are an essential element in perceiving opportunities for social change. In this case, we can expect social change to be achieved by attempts to gain access to similar resources as the high status group. For groups that perceive both high membership and high status permeability (e.g., the lower educated), more social change options are available. One might gain membership access to the high status group (e.g., by changing one's education level), or one might gain resource access to the high status group (e.g., by requesting higher salaries for the lower educated). In other words, by measuring different dimensions of permeability we can map out the social change options available to different groups. In sum, the present conceptualization of permeability also provides interesting avenues for studying social change perceptions across individuals and different types of groups (see also Louis, 2009; Stroebe, Wang, & Wright, 2015).

Furthermore, while SIT (Tajfel, 1974; Tajfel & Turner, 1979) has focused on low status group members, it would be interesting to expand the nature of the social contexts studied. For example, what are perceptions of permeability and subsequent behavioral responses in high status group members? High status groups, overall, show even higher identification with their group and more outgroup bias (Bettencourt, Dorr, Charlton, & Hume, 2001). Such bias can increase when high status group members feel threatened, such as when group boundaries are considered permeable (e.g., Scheepers, Ellemers, & Sintemaartensdijk, 2009). Work by Alperin and colleagues (2014) suggests that prejudice and aversion of high status group members toward low status group members can be instigated by the fear of entering the low status group, thus by experiences of high membership permeability. By contrast, the experience of status permeability may induce quite different concerns in high status group members, pertaining more to preservation of resources and protection of one's group identity (e.g., Johnson et al., 2005). Within groups, changes in status relations may also occur: a woman may, for example, be low status in some contexts (e.g., a female professor among a majority of male professors) and high status in others (e.g., a female professor among male PhD students). It is possible that such changes in context temporarily affect perceptions of, in this case, status permeability. Notably, such an approach moves beyond SIT to consider status variability within groups. We conclude that studying how the social context and potential changes in status affect responses of high status group members to different types of permeability is an interesting avenue for future research. Our scale is well suited for such research as it was designed to be applicable to both high and low status groups.

Limitations

The current work has some limitations that can be addressed in future research. First, the sample size for obese persons was rather small. This may explain the nonconvergent models of measurement invariance, the smaller reliability of membership permeability, the lack of significant correlations with BMI, and the lower model fit indices for this group compared with the other groups. Lower fit indices in the CFA for the groups of lower educated and ethnic minorities as well as problems with measurement invariance may also be related to small sample sizes.

A second potential limitation pertains to the sample. Recruitment of participants via an Internet site raises concerns regarding the lack of control over respondents, for example, whether they are subject to distractions or whether they take the task seriously. However, research on the reliability of data obtained via Mturk showed that it meets or even exceeds the psychometric standards associated with published research. Furthermore, Mturk has the advantage that participants are more demographically diverse than is the case for more traditional recruitment methods (Buhrmester, Kwang, & Gosling, 2011).

Third, we relied on the BMI to classify participants as obese. This may be problematic because BMI does not take into account muscle mass. Notwithstanding these limitations, the fact that the scale was applicable to five different social groups with different permeability perceptions makes us confident that the scale can also be applied to other social groups. Future research can profit from testing the correlates and predictive value of the scale when applied to other types of groups, such as ideological or economic groups.

Conclusion

The present research unifies existing theoretical and empirical work on permeability perceptions and intergroup relations by proposing a comprehensive conceptualization of permeability as a two-dimensional concept, which comprises membership and status permeability. Findings underscore the notion that low status groups differ regarding perceptions of these two dimensions of permeability. We hope our scale will stimulate researchers to take into account different types of permeability when trying to understand either differences between different types of social groups or group members' attitudes and responses toward inequality.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by a grant from the Dutch Science Foundation, project number 022.003.040.

Supplemental Material

The supplemental material is available with the online version of the article.

Notes

1. Due to a technical error, 73 participants did not belong to the group of obese persons as they had a body mass index between 25 and 30. According to the international classification of overweight and obesity by the World Health Organization, they would be classified as overweight rather than obese (e.g., Gilmore, 1999). These participants were removed from the analysis.
2. Although older adults did not rate their group as significantly lower in status than the group of younger adults, there is abundant evidence of older adults' disadvantaged position in Western society (e.g., Levy, 2003). For this reason and because our measurement of permeability was designed to be applicable across both high and low status groups, we considered the data of the group of older adults suitable for the development and validation of the scale.
3. To further assess the face validity and applicability of the items to the intended social groups, we conducted a survey among 28 experts in the areas of intergroup relations and SIT. They were asked to (a) rate the extent to which the final scale items operationalize a definition of permeability we provided and (b) rate how well the items measured permeability in our sample groups. Experts felt the scale items reflected our definition of permeability well, although some expressed concern about the value constraint items. This may be because at the time we had not integrated the subjective aspect of permeability in our definition. The experts felt the items applied well to all subgroups. The quantitative results of this survey are available as online supplementary material.
4. We excluded the group of obese for this analysis as the sample size of this group was too small and models including this group did not converge.
5. Although the characteristic of "innateness" does not fully apply to the group of older adults, we use this term to distinguish the groups of older adults, women, and ethnic minorities from the less biologically determined social categories, the obese, and lower educated.

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