Running head: MULTIPLE SUBGROUPS EFFECTS

Judging a Group from Sampling Members: How the Subdivision of a Minority Affects its Perceived Size and Influence

Wilhelm Hofmann

University of Würzburg,

Germany

Paul D. Windschitl

University of Iowa,

USA

In press, *Journal of Social Psychology*

Please address correspondence concerning this article to:

Wilhelm Hofmann
Department of Psychology
University of Würzburg
Röntgenring 10
97080 Würzburg
Germany
Phone: +49 (931) 312860
Fax: +49 (931) 312812
Email: hofmannw@psychologie.uni-wuerzburg.de

Abstract

A frequency sampling paradigm was used to investigate how perceptions of a minority group's size and influence are affected by the manner in which the subgroup structure of the minority is presented. Participants in two experiments read sequentially sampled opinions that members of a hypothetical committee held about a controversial proposal. The minority members holding "against" opinions were either described as belonging to the same group (the single-entity condition) or as belonging to three subgroups (the multiple-subgroups condition). Although the numbers of "for" and "against" opinions were held constant, predictable biases emerged in participants' frequency reports. Consistent with an information-loss account, the minority was viewed as larger in the multiple-subgroups condition than in the single-entity condition. The manipulation also affected the perceived social influence of the minority on the committee decision outcome.

[word count: 132 words]

Keywords: frequency sampling, minority influence, group perception, persuasion

Judging a Group from Sampling Members: How the Subdivision of a Minority Affects its Perceived Size and Influence

For controversial issues and proposals, observers may often try to determine the proportions of people who fall on the "for" versus "against" sides. All else being equal, when more people are for a proposal than against it, the numeric majority (i.e., the "for" group) is perceived to have the upper hand. However, in the real world, all else is rarely equal. There are a variety of factors that could complicate this simplistic situation. Two such factors are critical for the research described in this paper. First, although media sources will sometimes provide people with summarized polling information about the frequencies of various opinions, there are many contexts in which people do not have access to such summary data. In those contexts, observers may do their own form of data collection and analysis to judge the relative strengths of the majority and minority camps. Second, there is more than one way to characterize a given group. An "against" group could be characterized as essentially one entity, or it could be characterized as a group composed of several subgroups, all of which are against a proposal. For example, consider how the opposition to the easing of a labor law might be characterized. Twenty people who oppose the law might be characterized as a group of 20 pro-worker individuals, or they might be characterized as 8 pro-worker teachers, 7 pro-worker health-professionals, and 5 pro-worker factory workers instead.

Social influence research in the legacy of Solomon Asch (1955) provides some indication of whether the perceived influence of a group might be greater when the group is characterized as a multiple-subgroups entity rather than a single entity. Wilder (1977, 1978) found that the social influence of a number of persons increased with the number of social units into which they were categorized. Specifically, Wilder (1977) showed that participants were increasingly more influenced by the opinions of a discussion group of six people about a legal case when the group was presented as two groups of three persons or three groups of two persons rather than as a single group of six persons. In another study (Wilder, 1978),

eight jurors were more influential on participants' opinions when variation in race and occupation made it possible to categorize the jurors into various subgroups rather than into a single, homogeneous group of eight.

A considerable amount of research has investigated the consequences of subgrouping on perceived variability, stereotyping against the group, and stereotype change (Park, Wolsko, & Judd, 2001; Park, Ryan and Judd, 1992; for a review, see Richards & Hewstone, 2001). Park et al. (1992) for instance found that subgrouping leads to more perceived variability among target group members and less stereotypic perceptions of the group. Although this line of research is relevant for understanding how subgroups are perceived in terms of their composition and variability, it did not explore the consequences of subgrouping on the perceived social influence of the group.

In Wilder's (1977, 1978) research, information on group size was immediately present to perceivers in his studies. In the present work, however, we applied his paradigm to contexts in which a cognitive representation of a group conflict gradually develops as group membership information and arguments are being sampled "bit by bit" (e.g., Fiedler & Juslin, 2006). That is, participants did not receive summary data about the proportions of people holding a "for" or "against" opinion on the key proposal; instead, they learned about the opinions of individuals in a randomly sequenced fashion, which required the participants to estimate for themselves the frequencies of "for" and "against" opinions. Crucially, we investigated whether splitting a minority into smaller subgroups has predictable effects on perceivers' subjective representation of the minority—and possibly also the majority—and whether this representation in turn influences further judgments of the group's influence. Hence, the predictions regarding our experiments originate from theoretical perspectives on information sampling and general judgment processes.

In work on frequency processing, Fiedler and colleagues (Fiedler, 1996, 2002; Fiedler & Armbruster, 1994) argued and demonstrated that splitting a given stimulus category into

smaller subcategories can increase the summed subjective frequencies of stimuli from that category. For example, after having seen a set of stimuli that includes various squares, triangles, and other shapes, people report more total triangles if asked to separately report the frequencies of upward-peaked triangles and downward-peaked triangles, than if asked to report the frequencies of all triangles (Fiedler & Armbruster, 1994). This finding was explained with an *information-loss account* according to which the mental representation of the sampled frequency data is distorted in a systematic way as a function of the intrusion of error variance, leading to a predictable bias in the recollection of the actual input. To the extent that information is lost (e.g., through memory decay, lack of attention, overload, distraction), the cognitive reproduction of an observed frequency distribution will regress toward the mean of all category frequencies observed. This regression effect should increase as accuracy decreases, and extreme values should be affected most by the regression effect (Fiedler & Armbruster, 1994). In the case of maximum information loss, the subjective frequency estimates for each category encountered should coincide with the mean of all category frequencies.

The information-loss perspective provides a clear prediction for the perception of minority group size in our experiments, in which participants learned about whether each of 27 people held a "for" or "against" position regarding a hypothetical proposal. Of the 27 people, 15 held a "for" position (the majority) and 12 held an "against" position (the minority). The key manipulation was that some participants encoded the members of the minority as all belonging to a single group, whereas others encoded the 12 members of the minority as belonging to three separate subgroups (with frequencies of 5, 4, and 3). Participants in the former condition (the single-entity condition) were asked to report the frequencies of the majority group and the single minority group, whereas the participants in the latter condition (the multiple-subgroups condition) were asked to report the frequencies of the majority group and each minority subgroup. The information-loss perspective suggests

that the minority frequencies reported in the single-entity condition should regress toward the mean frequency of (15 + 12) / 2 = 13.5 whereas minority frequencies reported in the multiple-subgroups condition should regress toward the mean frequency of (15 + 5 + 4 + 3) / 4 = 6.75, and hence the combined frequency of all three minority subgroups should approach 3 × 6.75 = 20.25. Hence, the combined minority frequencies in the multiple-subgroups condition should be higher than the reported minority frequencies in the single-entity condition. Because it is reasonable to expect some but far from complete information loss to occur during frequency sampling, we predicted that the combined minority frequencies in the multiple subgroups condition would not reach the value of 20.25 in absolute terms yet clearly exceed the reported minority frequencies in the single-entity condition.[1]

Although the information-loss perspective makes a clear prediction about judged frequencies, it is unclear whether perceived group size also extends to other important dependent variables such as participants' predictions about the outcome of a meeting in which there will be a decision on the proposal. One straightforward possibility is that, because the overall frequency of the minority looms larger in the multiple-subgroups condition than in the single-entity condition, participants in the former condition would also expect the minority to be more influential and less likely to lose the decision. This prediction may be derived from social impact theory (Latané and Wolf, 1981) according to which the social impact of a given group experienced is—among other factors such as temporal and physical immediacy—a function of the (perceived) number of people exerting this influence. Therefore, participants' judgment about the committee's decision in the multiple-subgroups condition should reflect the impact of an upwardly biased minority representation.

In summary, we expected that, consistent with the information-loss perspective, the combined minority frequencies reported by participants in the multiple-subgroups condition would be greater than the minority frequencies reported by participants in the single-entity condition and that the biased representations in the multiple-subgroups condition would also

show carry-over effects with regard to predictions about the decision outcome of the full committee.

Method

Because of the similarity in method and procedure we provide a combined presentation of the methods and results section for both studies conducted.

Participants

A total of 67 (Study 1) and 78 (Study 2) male and female psychology undergraduates from the University of Iowa participated in a study on "social issues" in exchange for partial course credit. Gender ratios mirrored the usual gender ratio (3 females: 1 male) of students in the psychology department research participant pool. Participants were assigned randomly to experimental conditions.

Materials and Procedure

After participants had provided informed consent, the following scenario about a controversial issue concerning church groups was presented to participants from both studies:

> Imagine you are a reporter for a local newspaper in town T. The city owns a popular recreation area with camping facilities and group meeting places used by many groups living in T. More than 50 years ago, the recreation zone was built as a cooperative project by the local churches in T on their own support and was restricted to their private use only. Twenty years ago the park became public property, purchased from the churches by the city, and from then on was accessible to all citizens in T. Since then, the park facilities could be used on a fee for access basis. Historically, church members in T had paid less than non-religious groups for the recreation park facility use in a friendly gesture from the city. Because of financial shortcomings, however, the city council of T is now thinking about increasing the fees of church members to match those of non-religious groups.

Additional information indicated that the city council's special committee would be holding a meeting in order to decide whether to pass or reject the proposal. Participants were told to assume they were a journalist who approached each member of the committee upon entering the building shortly before the start of the meeting in order to ask each one for a short statement about his or her opinion towards the issue and also about his or her religious membership.

In the information-sampling task that followed, participants saw information about committee members in a random order on a computer screen. In total there were 27 committee members: 15 were in favor of an increase in fees (the majority) and 12 were against an increase (the minority). In this research we opted for a relatively small discrepancy between majority and minority group size as we wanted to investigate whether the bias in perceived minority group size due to category split effects may even be strong enough to invert the actual group size ratio. Further, the minority was chosen to be big enough in order to enable a split into at least three distinct subgroups. As a critical manipulation of minority presentation, we varied whether the minority was presented as a single group or as consisting of multiple subgroups, while at the same time the arguments presented by the majority and minority were identical across conditions.

In the *single-entity* condition, both the majority and the minority comprised one religious affiliation each. In contrast, in the *multiple-subgroups condition*, the minority was subdivided into three smaller factions comprising 5, 4 and 3 members, thus adding up to a total of 12 minority members. In order to maximize the cohesiveness of the (sub)groups and not to further complicate the information sampling task for participants, each (sub)group unanimously represented one standpoint, either for or against the increase in fees, and each (sub)group was made up of members who all shared the same religious affiliation. All group affiliations were taken from a set of four possible affiliations (Episcopalian, Lutheran, Methodist, and Presbyterian) and balanced across conditions.

In the information sampling sequence, participants read through all 27 committee members' descriptions/statements in a sequential and random order. A computer was used to display the descriptions/statements (one per screen). Each committee member was first introduced by a description of his or her religious affiliation. After a delay of 1,200 ms, the committee member's personal argument about the issue was presented, always beginning with a short general statement about his or her siding (either "I am against it" or "I am in favor of it"). The purpose of this general statement was to facilitate participants' processing of the following argument. Pro arguments were mostly based upon concerns for equality and fairness, e.g. "I will vote for an equal treatment of all citizens". Contra arguments on the other hand emphasized the obligation and sense of duty that the city owes to the churches, e.g. "We have an agreement with the city. They can't just break such an agreement whenever they would like to." (see Appendix for a complete list of arguments used). Argument quality was designed in a way that the reasoning on both sides was understandable and plausible, in order to not bias the decision too clearly towards one side.

After participants had read through the information given for a committee member, they had to click a button (displayed after 2 s) in order to move on to the next committee member. This procedure ensured that all information could be read through completely by the participants. Each argument was presented once. In the multiple-subgroups condition the assignment of minority member arguments to the three subgroups was also randomized.

Following the presentation of opinions, participants were first asked with an open-ended response format how many members of each church group they encountered at the entrance to the meeting (*frequency estimate*). We randomized the order of frequency estimates for the different church groups. Second, participants were asked how they would generally characterize the types of opinions in the committee (*committee opinion*). A final dependent variable (*expected decision outcome*) assessed participants' expectation about the decision outcome of the meeting ("From what you've heard, how do you think the committee will

decide?"). Participants could indicate their answer to these questions on 9-point scales with the poles "in favor of an increase in fees" vs. "against an increase in fees." At the end of the study, participants were debriefed about the full purpose of the study.

Study 2 was intended as a close replication and minor extension of Study 1. All procedural elements were identical, with the exception that the order of dependent measures was varied as a second between-participants factor. Specifically, we investigated whether effects of minority presentation on committee opinion and expected decision outcome differ as a function of whether participants recalled sampling frequencies before or afterwards. For instance, it is conceivable that having to make frequency judgments first may prime this variable, thus rendering the influence of perceived group size more important than otherwise. Hence, in addition to the *frequency first* condition (analogous to Study 1) we introduced a *frequency last* condition in which frequency estimates were provided after the other dependent variables.

Data Preparation

For each participant in the multiple-subgroups condition, we summed the estimated frequencies for the three minority subgroups. Data were excluded from analysis if the estimation of majority or minority frequencies was further than three standard deviations apart from the respective sample mean. One participant in Study 1 and three participants in Study 2 were excluded because of unrealistically high estimations.

Results for Study 1

Minority and Majority Frequency Estimates

The initial question of interest was whether the subdivision of the minority influenced the frequencies reported for the minority group(s). Table 1 displays the mean estimated frequencies for both experimental conditions. In the single-entity condition ($N = 32$), the mean of the minority frequency estimates was not significantly different from the correct value of 12 ($M = 11.63$; $SD = 3.78$) as determined by a one-sample t-test, $t(31) = -.561$, $p =$

.58, $d = .09$. However, consistent with the information-loss account, the summed minority frequencies reported in the multiple-subgroups condition ($N = 34$) were upwardly biased from the correct value ($M = 16.09$; $SD = 5.94$; $t(33) = 4.02$, $p < .001$, $d = .69$) and differed significantly from the single-entity condition, as determined by a *t*-test for two independent samples, $t(64) = 3.62$, $p < .001$, $d = .92$).[2] Specifically, mean estimated frequencies for the three minority subgroups (5, 4, and 3 members) amounted to 5.91, 5.44, and 4.74 respectively.

A second question of interest was whether the subdivision of the minority influenced the frequencies reported for the majority. One might expect that, because the majority group is not being subdivided in our minority-presentation manipulation, the majority frequencies should be unaffected by the subdivision of the minority group. However, the information-loss account predicts that there may be a difference in the majority frequencies reported as a function of the minority-presentation manipulation. This is because the mean of the group sizes in the multiple-subgroups condition (6.75) is much lower than the mean of the group sizes in the single-entity condition (13.5). Therefore, frequency estimates for the majority should regress toward a lower value in the former condition than the latter (see Fiedler & Armbruster, 1994). Consistent with this prediction, the majority-frequency reports were significantly downwardly biased in the multiple-subgroups condition ($M = 12.12$; $SD = 3.80$; $t(33) = -4.42$, $p < .001$, $d = .76$) but matched the correct frequency quite well in the single-entity condition ($M = 14.53$; $SD = 5.39$; $t(31) = -.492$, $p = .63$; $d = .09$). The means from both conditions differed significantly from each other, $t(64) = 2.11$, $p = .039$, $d = .53$.

Committee Opinion and Expected Decision Outcome

Apart from the distortion of perceived frequencies, does subdividing the minority have further reaching effects on reports about committee opinions and expected decision outcome? Table 1 displays the relevant means for these dependent variables. For both variables, we centered the data around the midpoint of the scale, resulting in values that ranged from -4 to

+4. Positive scores favor the majority view (for increase in fees) and negative scores favor the minority view (against increase in fees).

Consistent with the biases observed for the frequency reports, the perceived overall committee opinion was influenced by our experimental manipulation, $t(64) = 2.30$, $p = .025$, $d = .58$. Specifically, participants judged the overall sentiment of the committee to fall more toward the minority position when the minority was subdivided into distinct factions rather than undivided. Reports about the expected committee decision, however, were not significantly influenced by the presentation of the minority in Study 1, $t(64) = .58$, $p = .63$, $d = .15$.

Results for Study 2

The dependent variables from Study 2 were analyzed using a two-factorial ANOVA procedure that included minority presentation (single entity vs. multiple subgroups) and question order (frequency first vs. frequency last) as between-participants factors. There was neither a significant question-order main effect nor a reliable interaction with minority presentation for any of the dependent variables. We therefore concluded that the effects of minority presentation were comparable across both question orders. In the following we will report the main effects for minority presentation only. Table 1 presents means that were collapsed across the question-order factor, leading to a total of $N = 39$ in the single-entity and $N = 36$ participants in the multiple-subgroups condition.

Minority and Majority Frequencies

As in Study 1, there was a significant main effect for minority presentation in the analysis of minority frequency estimates, $F(1, 71) = 12.15$, $p < .001$, $d = .81$[3], indicating that participants in the multiple-subgroups condition reported significantly higher minority frequencies than participants in the single-entity condition (see Table 1). In the analysis of majority frequency estimates, there was also a significant main effect for minority presentation, $F(1, 71) = 4.57$, $p = .036$, $d = .52$, indicating that subdividing the minority also

resulted in lower majority estimates (see Table 1). As in Study 1, the category split manipulation led to an overestimation in minority group size (M = 15.67; SD = 5.84; t(35) = 3.77, $p < .001$, d = .63) with regard to the correct estimate of 12, with subcategory mean estimates amounting to 5.67, 5.14, and 4.86 for the 5, 4, and 3 member minority groups. As in Study 1, a corresponding underestimation of majority group size (M = 12.31; SD = 3.74; t(35) = -4.32, $p < .001$, d = .72) with regard to the correct estimate of 15 was obtained. Again, participants' frequency estimates in the single-entity condition did not significantly differ from the correct values.

Committee Opinion and Expected Decision Outcome

Analogous to Study 1, the minority-presentation manipulation had a significant effect on participants' reports about the overall opinion of the committee, $F(1, 71) = 4.14$, $p = .046$, d = .47. Unlike in Study 1, however, the minority-presentation manipulation also had a significant influence on participants' expectations about the decision of the committee: Participants were significantly more likely to expect the majority position to win in the single-entity than in the multiple-subgroups condition, $F(1, 71) = 5.41$, $p = .023$, d = 54. The effect of minority-presentation manipulation on participants' expectations about the committee's decision is in a direction consistent with the informational-loss perspective.

Combined Analysis of Studies 1 and 2

In order to investigate whether the results obtained are homogeneous across both studies, we analyzed both datasets together by adding a replication factor (i.e., Study) as a between subjects variable. Separate 2 (Group: single entity vs. multiple subgroups) × 2 (Study: Study 1 vs. Study 2) ANOVAs of majority estimate, minority estimate, committee opinion, and expected decision outcome all yielded a significant main effect of Group (all ps < .05), no significant effect of Study (all ps > .10), and, most important, no significant interaction between Group and Study (all ps > .30), indicating that both studies yield similar findings.

Furthermore, we calculated the degree of information loss in the category split condition for each variable and study by (a) computing the difference between the grand mean of category frequencies and the subjective frequency estimate for a category, (b) computing the difference between the grand mean of category frequencies and the objective frequency for that category, and (c) forming the ratio of (a) to (b). This ratio serves as an index of the percentage to which actual differences in category frequency were reduced toward the grand mean. In the case of total information loss, this ratio equals 1 (100%), in the case of no information loss it equals 0 (0%). For instance, information loss for the 3 member subgroup in Study 2 amounted to (6.75 – 4.86)/(6.75 – 3) = 50%. The averaged information loss in the category split condition across both studies amounted to 45%.

Discussion

In this research we investigated whether presenting a minority as having multiple subgroups as opposed to a single entity influences the perceived size of the minority, the size of the majority, and further reaching judgments related to the outcome of a group conflict scenario. Across two studies on a controversial issue involving a majority and minority group position in which participants learned about each group member's opinion and affiliation "bit by bit", we obtained clear evidence for an overestimation of minority group size and influence when the majority was split into several factions, as postulated by Fiedler & Armbruster's (1994) information-loss perspective on frequency sampling. Clearly then, whether a fractioned minority group presents itself as either a whole group or as consisting of multiple subgroups in a scenario in which information is gathered bit by bit, has important implications for its perceived group size and influence. Quite contrary to what one may expect intuitively, this research shows that splitting a minority into multiple subgroups lead to an upward bias in the cognitive representation of minority group size due to a regression effect toward the grand mean of group frequencies.

It is interesting to note that the subdivision of the minority also appeared to distort the cognitive representation of the actual majority such that perceived minority estimates even superceded perceived majority estimates, leading to a reversal effect. That is, even though participants in the multiple-subgroups condition read about 15 majority-group members and a total of only 12 minority-group members, their frequency estimate for the majority group was approximately 12, and the sum of their frequency estimates for the minority groups was 16. As discussed earlier, the information-loss perspective can account for the underestimation of the majority, too, because the average group size in the multiple-subgroups condition is quite small. When information loss occurs, frequency judgments about the majority regress to that average. Future research will have to show whether the predictions derived from the model also generalize to a setting where the majority is split into several factions.

As a second main objective we investigated the effects of the minority split manipulation on participants' characterization of the overall committee opinion and their expected decision outcome. Our results indicate that the subdivision of a minority group strongly influences the way in which the distribution of opinions in a larger group is perceived and that it can also influence the expected outcome of the group conflict (Study 2). Importantly, these effects could not be attributed to the order in which questions were asked, as no interactions between minority presentation and question order could be detected in Study 2.

At first glance, these findings seem to contradict Moscovici and colleagues' (e.g., Moscovici, Lage, & Naffrechoux, 1969; Moscovici & Nemeth, 1974) model of minority influence demonstrating the persuasive influence of a consistent as opposed to an inconsistent minority. However, in Moscovici's line of research "consistency" was defined with regard to *behavioral style*, i.e., the degree to which different minority members display convergent or divergent views toward a given issue. In our studies, minority members were always consistent with regard to their stance toward the issue as their statements were unanimously

directed against the proposal, independent of experimental condition. Yet, minority members in the multiple subgroup condition were inconsistent with regard to their religious group affiliation. Hence, our findings qualify the role of high vs. low consistency of group affiliation in cases with high consistency of behavioral style (as investigated by Moscovici and colleagues) by showing that highest influence is to be expected from a behaviorally consistent *and* affiliation-inconsistent minority.

But what are the exact processes by which the subdivision of a minority might influence the perceived distribution of power in a group conflict? We have already mentioned the possibility that the biased perceptions of the minority and majority group size (caused by information-loss) simply influence the perceived relative strength of these groups as predicted by social impact theory (Latané & Wolf, 1981). Aside from this explanation, there are still others that do not necessarily imply a distorted representation of group sizes and might nevertheless explain how the subdivision of a group could influence expectations about the outcomes relevant to a larger group. For instance, the subdivision of the minority may render its individual members more salient as their group affiliation is less often encountered, and this salience advantage may give rise to a more systematic elaboration of the arguments brought forward by these individuals (cf. Chaiken, 1987; Petty & Cacioppo, 1986). In other words, members from small groups may enjoy some sort of processing advantage over members from larger groups (Latané & Wolf, 1981). Or, coming back to the issue of consistency (e.g., Moscovici & Nemeth, 1974), full consensus among subgroups may leave a perceiver with the impression that the point of view that receives such high consensus (high behavioral consistency) across different groups (low group affiliation consistency) has merit and will ultimately "win out" after further consideration. One limitation of our studies is that they cannot distinguish among all of these possible mechanisms, which are probably best viewed as multiple contributing causes rather than mutually exclusive.

A second limitation is that the topic of our studies, though well-suited as a cover story and for the category split-manipulation, opens a question regarding the degree to which the participants' religious identifications or attitudes toward church-state separation in the USA may have influenced our results. Given that participants were assigned randomly to experimental conditions, it is unlikely that religiosity had a confounding effect on our manipulation. Still, variations in religious identification and attitudes could have introduced irrelevant variance in our dependent variables so that controlling for such influences would have been desirable.

In conclusion, our findings suggest that splitting a minority into smaller parcels has traceable effects on the representation of group size in settings where information about the composition of the minority is sampled "bit by bit." The representation of frequencies in turn influences further judgments about the relative strength of the group and expectations regarding decision outcomes. As many minorities can be described as either homogenous entities or a composition of several subgroups, our results suggest that—all else being equal—presenting a minority as rich in subgroup structure may have consequences that ultimately prove to be strategically important.

Author Notes

Wilhelm Hofmann is an assistant professor at the University of Würzburg. His main research interests are in dual-process theories of the mind and social cognitive aspects of self-regulation.

Paul D. Windschitl is an associate professor of psychology at the University of Iowa. His main research interests include likelihood judgments, risk assessment, and comparative judgment processes.

References

Asch, S. E. (1955). Opinions and social pressure. *Scientific American, 193,* 31-35.

Chaiken, S. (1987). The heuristic model of persuasion. In P. Zanna & J. M. Olson & C. P. Herman (Eds.), *Social influence: The Ontario symposium* (Vol. 5, pp. 3-40). Hillsdale, NJ: Erlbaum.

Fiedler, K. (1996). Explaining and simulating judgment biases as an aggregation phenomenon in probabilistic, multiple-cue environments. *Psychological Review, 103,* 193-214.

Fiedler, K. (2002). Frequency judgments and retrieval structures: Splitting, zooming, and merging the units of the empirical world. In P. Sedlmeier & T. Betsch (Eds.), *Etc. Frequency processing and cognition* (pp. 67-87). New York: Oxford University Press.

Fiedler, K., & Armbruster, T. (1994). Two halves may be more than one whole: Category-split effects on frequency illusions. *Journal of Personality and Social Psychology, 66*, 633-645.

Fiedler, K., & Juslin, P. (2006). *Information sampling and adaptive cognition*. Cambridge: Cambridge University Press.

Latané, B., & Wolf, S. (1981). The social impact of majorities and minorities. *Psychological Review, 88,* 438-453.

Moscovici, S. & Nemeth, C. (1974). Social influence II: Minority influence. In C. Nemeth (Ed.), *Social psychology: Classic and contemporary integrations*. Chicago: Rand McNally.

Moscovici, S., Lage, E., & Naffrechoux, M. (1969). Influence of a consistent minority on the responses of a majority in a color perception task. *Sociometry, 32,* 365-380.

Park, B., Ryan, C. S., & Judd, C. M. (1992). Role of meaningful subgroups in explaining differences in perceived variability for in-group and out-group members. *Journal of Personality and Social Psychology, 63,* 553-567.

Park, B., Wolsko, C., & Judd, C. M. (2001). Measurement of subtyping in stereotype change. *Journal of Experimental Social Psychology, 37,* 325-332.

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology*, 19, 123-205.

Richards, Z., & Hewstone, M. (2001). Subtyping and subgrouping: Processes for the prevention and promotion of stereotype change. *Personality and Social Psychology Review, 5,* 52-73.

Wilder, D. A. (1977). Perception of groups, size of opposition and social influence. *Journal of Experimental Social Psychology, 13*, 253-268.

Wilder, D. A. (1978). Homogeneity of jurors: The majority's influence depends upon their perceived independence. *Law and Human Behavior, 2,* 363-376.

Appendix

Majority arguments:

1. I don't mind sharing the park equally. We had our privileges long enough.
2. As a church member, I don't want to be treated any better than a non-church member.
3. In hard times we all have to contribute our share for the public good. Therefore we shouldn't always look for our own advantages but rather give something.
4. I will vote for an equal treatment of all citizens.
5. To me it seems odd why we as church members should receive special benefits that other groups do not get.
6. I don't see why we church members should be treated any better than non-religious people.
7. I think everyone should be treated equally. That's just fair.
8. We church members profited so much in the recent years. It is time that we also contribute our part.
9. The park should be equally affordable to every citizen in this city.
10. We church members don't need any privileges.
11. We were privileged long enough for no reason, so let's try to be fair about this.
12. In my view, we need a new agreement - an agreement with equal access for everybody.
13. We churches are rich enough to bear the increase.
14. If the city really needs the money, then I can fully understand why they have to raise our fees.
15. If the city really needs the money, then I can fully understand why they have to raise our fees.

Minority arguments:

1. This site is a traditional property of the churches. They should take that into account.
2. Did they forget that it was us who had built the whole place?
3. The city seems to be neglecting the fact that it still owes us a favor for the building of the park.
4. I think the city is burdening the wrong group. We church-members shouldn't be the scapegoats of the city's administrative problems.
5. The city officials undermine the faith that we had placed in them.
6. By having us pay they set the wrong signals: it was us who contributed that wonderful park to the city and now it seems as though we have to pay for it.
7. It was us who allowed the park to be used for all people and now nobody seems to honor that anymore.
8. I won’t let the city pay its debts by raising our fees.
9. When we gave the park to the city, we made an agreement. It seems like the city officials want to break that agreement for dubious reasons.
10. We churches have been and still are contributing so many services to the city. It is just fair if we pay less than those who do not care for our community.
11. We have an agreement with the city. They can't just break such an agreement whenever they like to.

12. I am very upset. In all those years the city cooperated with us, but now it seems as though we are reduced to some sort of tax payers.

Footnotes

[1] For instance, assuming a more plausible information loss of 50%, we would predict reported frequencies in the multiple-subgroups condition to amount to [0.50 × (15 – 6.75)] + 6.75 = 10.88 for the majority and – by the same token – to 5.88, 5.38, and 4.88 for the three minority categories of 5, 4, and 3 elements, respectively, summing up to a combined minority frequency of 16.13.

[2] Wherever the Levene-test for equal variances produced a significant result, corrected degrees of freedom were used for the Student's *t*-test. For simplicity, all reported degrees of freedom and t-values in the text refer to the uncorrected data, all *p*-values, however, are corrected for unequal variances wherever necessary.

[3] For comparison purposes with Study 1, all effect sizes for the difference between means in the single-entity and multiple-subgroups condition in Study 2 have been computed from a *t*-test comparison of means collapsed across the order factor.

Table 1

Means and Standard Deviations for Minority and Majority Frequency Estimates, Committee Opinion and Expected Decision Outcome in the Single-Entity and Multiple-Subgroups Condition for Studies 1 and 2

		Single entity	Multiple subgroups
Minority estimate	Study 1	11.63_a (3.78)	16.09_b (5.94)
	Study 2	11.85_a (3.63)	15.67_b (5.84)
Majority estimate	Study 1	14.53_a (5.39)	12.12_b (3.80)
	Study 2	14.21_a (3.58)	12.31_b (3.74)
Committee opinion	Study 1	$.59_a$ (1.37)	$-.38_b$ (2.00)
	Study 2	$.85_a$ (1.04)	$.28_b$ (1.37)
Expected decision	Study 1	$.94_a$ (1.61)	$.65_a$ (2.36)
outcome	Study 2	1.28_a (1.40)	$.36_b$ (2.00)

Note. Standard deviations are shown in brackets. Committee opinion and expected decision outcome were rated on 9-point scales (-4 = against the proposal, i.e., the minority view, +4 = in favor of the proposal, i.e., the majority view).

Means in the same row that do not share subscripts differ reliably at $p < .05$.