The Relationship of General Life Values to Attitudes Toward Large Carnivores

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Abstract

Like a number of western countries, Norway is experiencing severe conflicts over predator control and loss of livestock. Conflict resolution is at least partly dependent upon understanding the underlying values and attitudes of the key actors. This study examines fundamental values and attitudes toward predators among sheep farmers, wildlife biologists, and research biologists in Norway. Attitudes toward the large carnivores are relatively negative among sheep farmers, and more positive among other groups involved in the livestock vs. carnivore conflict, like wildlife managers and biologists. We evaluated the assertion that the contrasting attitudes are related to differences in values between sheep farmers and the other two groups. Generally, the value structure showed large similarities across the three groups; six identical factors appeared in each of the groups. One separate and coherent factor, "Nature" (consisting of the five ecocentric value items), appeared in each group. "Nature" was the most important value dimension among wildlife managers and biologists, while a "Security" dimension was most important for sheep farmers. Negative attitudes toward carnivores were positively associated with items related to "Security" and "Tradition." Positive attitudes toward carnivores were positively correlated with "Openness to change" and "Nature" dimensions.

Keywords: *predator control, life values, attitudes, resource conflicts, livestock loss*

Introduction

Several studies have demonstrated that attitudes toward animals differ across groups delineated by demographic and socioeconomic variables like age, gender, education, and occupation (see review by Kellert 1996). Attitudes toward particular groups of animals, or even toward a single species, often function as an element in relatively intense and complex conflicts between human groups over natural resource issues, like the livestock *vs.* large carnivore conflicts (Bath 1989; Bjerke, Reitan and Kellert 1998; Kellert 1991). Such attitudes are believed to be moderately associated with actual behavior that occurs during conflicts, and have been shown to be affected by psychological factors like personal importance (Vittersø, Bjerke and Kaltenborn 1999; Bright and Manfredo 1996), and attachment to livestock (Vittersø, Kaltenborn and Bjerke 1998).

There are both theoretical and empirical reasons to believe that more fundamental values may serve as "prototypes from which attitudes and behaviors are manufactured" (Homer and Kahle 1988). Defined "as desirable transsituational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity" (Schwartz 1994, 21), values may influence attitudes toward external objects and events, which again may predict behaviors toward those external events or objects. Schwartz (1994) expressed that values serve the interest of a social group, motivate action, serve as moral standards for conduct, and are acquired through socialization.

Thus, when studying marked differences in attitude structure between sheep farmers and groups which seek to protect large carnivores (Kaltenborn, Bjerke and Vittersø 1999), we would at the outset also expect to find significant differences regarding fundamental values expressed by the same groups. However, attitudinal diversity need not necessarily imply large differences in values. Like most conflicts over natural resources, controversies over predators are complex phenomena involving more than competing social values. Economic issues and interest conflicts obviously play a part, and socialization has also been shown to be influential, since people who have grown up on a farm with livestock production express negative attitudes toward large carnivores, irrespective of their present occupation (Bjerke et al. 1998). Previously, it has been hypothesized that the disagreement about the management of the large carnivores reflects conflicts between groups regarding deep, enduring values, and that we are witnessing a collision between different cultures when we listen to the arguments of sheep farmers and wildlife managers (Mysterud 1992a, 1992b). Similar views have been presented by Wilson (1997) concerning the reintroduction of wolves in the USA.

If we want to identify potential differences in the value basis that is thought to contribute to differences between groups in attitudes toward a natural resource issue, we need to be relatively specific about how we conceptualise and operationalize values. We use a cognitive hierarchy model as the conceptual framework for the design and analysis of this study. The cognitive hierarchy is a structure where basic values, beliefs, attitudes, norms, behavioural intentions, and behaviours are thought to build upon one another (see for example Homer and Kahle 1988; Rokeach 1973, 1979) and is well suited for analysing wildlife value orientations (Fulton et al. 1996). Within this framework it is theorised that there are connections between the various levels in the hierarchy, much like a pyramid with general life values at the base and overt behaviour at the top (Fulton et al. 1993). In a previous study we have shown for the same sample we use in this paper, that there are relationships between environmental beliefs and attitudes toward carnivores (Kaltenborn et al. 1998). In the present study, we are concerned with potential relationships between general (basic) life values and attitudes toward carnivores. Here then, we consider general life values to be more fundamental psychological constructs than environmental beliefs. With regard to the rationale of the conceptual framework and previous empirical findings, we should also expect to find associations between general life values and attitudes toward wildlife, and furthermore that environmental beliefs mediate this relationship (although we do not test that assumption here).

A widely used theory of values was presented by Schwartz (1992, 1994). He identified ten types of values that could be ordered within a circular structure built around two dimensions. One dimension contrasts openness to change (self-direction, stimulation) with conservation (conformity, tradition, security). The second dimension contrasts self-enhancement to self-transcendence; this dimension reflects the distinction between self-interest (power, achievement), and concern for the welfare for others and nature (universalism, benevolence). A similar value structure was constructed by Stern and Dietz (1994). They identified one egoistic and one social-altruistic value orientation, corresponding to the Schwartz' self-enhancement and self-transcendence values, respectively. Stern's third value orientation (biospheric or ecocentric values) includes concern for subjects of life, like animals, ecosystems, and the biosphere. Such concern was also included in Schwartz's self-transcendence cluster, as statements like "unity with nature" and "a world of beauty." Past research has shown these value models to be useful in studies of recycling behavior (Vining and Ebreo 1992), ecological dilemmas (Axelrod 1994), and actions to protect the environment (Stern and Dietz 1994; Karp 1996). However, Stern and Dietz (1994) failed to identify one coherent set of ecocentric values in a representative sample of the U.S. population. Instead, they found one factor that included both social-altruistic (Schwartz's self-transcendence) and ecocentric (biocentric) values. Gardner and Stern (1996, 65) hypothesized that, though not yet examined, a separate ecocentric value orientation could emerge in certain groups, such as environmental activists.

This paper reports part of the findings from a larger study on human-carnivore interactions focusing on farmers, wildlife managers and research biologists. In other outlets we have reported attitudinal structure (Kaltenborn et al. 1999), relationships between attitudes and environmental beliefs (Kaltenborn et al. 1998), the role of attachment to livestock (Vittersø et al. 1998), the effects of different degrees of depredation on attitudes (Vittersø et al. 1999) and associations between locus of control and attitudes (Bjerke et al. 2000). In this study, we report on the relationship between basic life values and attitudes toward large carnivores.

To illuminate the assertion that sheep farmers hold different general values than the other groups involved (Mysterud 1992a, 1992b) we performed a survey among sheep farmers, wildlife managers, and research biologists in Norway by measuring general values. Regarding attitude conceptualisations and constructs we build extensively on Kellert's work as it has developed over several years (Kellert 1996, 1991, 1985). Previously it has been shown (Kaltenborn et al. 1999) that wildlife managers and research biologists in Norway endorse ecologistic and naturalistic aspects of the large carnivores, that they have low scores on the dominionistic, negativistic and utilitarian subscales of Kellert's attitude instrument, and that sheep farmers express the opposite attitude profile.

With regard to the structure of values, we first hypothesized that sheep farmers more than the other two groups emphasize values in the tradition and security groups (Schwartz 1994), based upon the previous finding that the farmers' concern about the future economic prospects of their farm predicts negative attitudes toward large carnivores (Vittersø, Bjerke and Kaltenborn 1999). It appears that individuals in this group, more than researchers and managers, feel that their future is threatened, and they are generally slower in adapting to modernity processes. However, we emphasize that this is an assumption that needs further empirical verification.

Thus, we also expected to find a positive relationship between the importance assigned by farmers to tradition and security type values, and negative attitudes toward large carnivores. Due to their interests and close occupational association with natural processes, we hypothesized that the ecocentric values would constitute one separate factor for all three occupational groups, and that a positive relationship

exists between this value dimension and positive attitudes toward large carnivores.

Methods

Sampling and Data Collection

The sampling frame for this study comprised 1) all sheep farmers in eleven municipalities in the counties of Hedmark in Eastern Norway, and of Rogaland in Southwestern Norway, 2) all research biologists at Norwegian universities, colleges, and research institutes, and 3) all wildlife managers in Norway working at the municipality and county level. We mailed the questionnaire to 853 sheep farmers, 379 research biologists, and 551 wildlife managers (in total 1783 respondents). The initial questionnaire was followed up by a first reminder 14 days after the initial mailing and a final reminder including the questionnaire 30 days after the initial mailing. The final response rates were 57.6% for sheep farmers, 70.4% for the research biologists, and 77.7% for the wildlife managers.

Survey Instruments

To measure attitudes we used 35 items representing statements about carnivores where the respondent had five options for each item (ranging from strongly agree to strongly disagree). The statements that were included in this study have been adopted from similar studies conducted in the USA by Kellert (1991) and translated into Norwegian. This required some modifications due to differences between the species which exist in USA and Norway. The statements that we included in this study are the same ones as those used in Kaltenborn et al. (1998), as well as the items used in another study by Bjerke et al. (1998). In the latter study, the term *wolves* was used instead of *large carnivores* (defined in the questionnaire as wolves, bear, wolverine, and lynx). The 35 items can be classified into the six scales briefly defined by Kellert (1991): *Ecologistic:* interest in the ecological value of the species, and its relationship to the environment; *Moralistic:* opposition to cruelty and harm toward the species; *Naturalistic:* interest in direct outdoor recreational contact with the species; *Utilitarian:* interest in utilization of the species, or subordination of their habitat for the practical benefit of humans; *Negativistic:* fear, dislike or indifference toward the species; *Dominionistic:* interest in the mastery, control and dominance of the animals. Previous analyses have shown (Vittersø et al. 1999) that the first three scales constitute one coherent factor of positive attitudes toward large carnivores, and that the next three scales form one negative attitude factor.

In order to look for associations between the general values and attitudes toward the large carnivores, we chose 26 value items from the following nine of Schwartz' (1992, 1994) value groups (number of items in parentheses): Tradition (2), Achievement (2), Self-direction (3), Hedonism (1), Benevolence (3), Security (4), Universalism (6), Power (3), and Stimulation (2). We added two items that we felt were of importance to the conflict about the presence of large carnivores: *Closeness to nature* (spend much time out-of-doors in contact with nature), and *Biological diversity* (protect all animal species). The respondents were asked to rate the importance of each item "as guiding principles in my life," on a five-point scale from "very important" to "very unimportant."

Analysis

Analysis of variance (ONEWAY) was conducted to identify differences in scores across the three sub-samples (sheep farmers, environmental managers and researchers) for the individual value items. The factor structure of the list of value items was explored through principal component analysis with varimax rotation. Factor scores were saved as variables representing value domains for the final solutions for the three groups of respondents. Reliability analysis was performed for each of the value dimensions for all three groups. For the six wildlife attitude scales, sum scores were calculated according to the procedure recommended by Kellert (see Bjerke et al. 1998). The factor scores of the value profiles of sheep farmers, environmental managers, and researchers were then correlated with the sum scores of the attitude scales. The principal component analysis with a varimax rotation assumes that the factors are not correlated. Thus, a regression analysis testing the effect of the value dimensions on the attitude scales should essentially produce beta values similar to the bivariate correlations between value and attitude scales. A regression analysis of all three groups confirmed this, but only the correlation table is reported here.

Results

Value Structure

There is considerable variance in the value structure, i.e., in the ranking of importance of the individual items making up the value domains.[2] Generally, the 28 items included here elicit positive responses. The mean scores range from 3.0 to 4.9, that is, they are considered to belong in the positive half of the scale. The exception is the item social power, which is viewed as relatively unimportant by all three groups (sheep farmers = 2.3, managers = 2.2, researchers = 2.1). In contrast, the values of family security, peace, honesty, and health received the highest rankings in all three groups. Statistically significant differences among the groups (at $p < 0.05$) are

found for 23 out of the 28 items. The items equality, family security, a world of beauty, enjoy life, and wealth, do not elicit statistically significant differences across the three groups. *Sheep farmers* score highest of the three groups on several items: social power, national security, peace, family security, authority, loyalty, respect for elders, respect for traditions, health, honesty, and helpful. *Environmental managers* score highest on protect the environment, influence, closeness to nature, and biological diversity. *Researchers* score the highest on freedom, excitement, variation in life, and curiosity. Although statistically significant differences among the three groups are found for a majority of the value items, it should be noted that in most cases the conceptual differences among the groups are not great. Yet, the pattern of responses clearly indicates somewhat different value orientations among the sheep farmers, environmental managers, and researchers. The largest differences were found for biological diversity (farmers lowest), natural security (farmers highest), respect for elders (farmers highest), and curiosity (researchers highest).

A series of exploratory factor analyses yielded a general structure of six value domains for the sheep farmers, environmental managers, and researchers. Separate analysis was performed for each of the three groups to determine whether the structure was similar. The amount of explained variance and internal structure of values varies somewhat across the three groups, but generally the factor solutions are quite comparable among the three sub-samples. The six value domains have been labeled "Nature," "Openness to change," "Security," "Tradition," "Self-enhancement," and "Altruism." Collectively, these factors or domains explain from 49.2 per cent to 51.2 per cent of the total variance. The reliability of the scales varies with Cronbach alphas from .47 to .74. None of the scales shows very high reliability, but the internal consistency is reasonably good. "Altruism" and "Self-enhancement" are the least reliable scales.

Among sheep farmers, the "Security" domain is the single most important value domain (alpha = 0.68). Combined with "Openness to change" (alpha = 0.74) they explain more than half of the explained variance in this solution. "Nature" (alpha = 0.70), "Tradition" (alpha = 0.72), "Self-enhancement" (alpha = 0.59), and "Altruism" (alpha = 0.57) collectively explain 20.2 per cent of the variance.

For managers, the "Nature" value domain (alpha = 0.73) explains far more variance than the other factors (18.4 %). Among these respondents, "Openness to change" (alpha = 0.65) also ranks as the second most important value domain in terms of explained variance (8.4%). The domains "Security" (alpha = 0.63), "Altruism" (alpha = 0.58), "Tradition" (alpha = 0.64), and "Self-enhancement" (alpha = 0.56) together explain 22.4 per cent of the variance.

We find much the same picture for the researchers. "Nature" (alpha = 0.74) and "Openness to change" (alpha = 0.71) explain 28.4 per cent of the variance in this factor solution. "Tradition" (alpha = 0.66), "Security" (alpha = 0.64), "Altruism" (alpha = 0.60), and "Self-enhancement" (alpha = 0.47) explain 23.1 per cent of the variance.

Looking at the factor structure of the value domains for sheep farmers, environmental managers, and researchers, the similarities among the three groups are more striking than the differences, although there are some interesting variations. The "Nature" domain is quite homogenous across the groups. Researchers interestingly associate influence as a characteristic of this domain. Sheep farmers associate influence with "Openness to change," whereas managers see it as an aspect of "Self-enhancement." Otherwise "Openness to change" is quite similar in structure and importance to the three groups. Security is more dominating for the sheep farmers than the other two groups, and also in this case includes independence. In contrasting the other groups, for managers the national security falls into the tradition group of values. The "Tradition" domain includes respect for elders and traditions, as well as loyalty and helpfulness. Sheep farmers also group justice in this domain, while researchers include community. Some variations are also found for the "Self-enhancement" and "Altruism domains." Self-enhancement is generally associated with wealth, social power, and authority. Managers also include influence and independence, while researchers associate honesty with this domain. Altruism taps values associated with equality, freedom, and justice. Researchers group independence in this domain, while managers include community.

Relationships between General Values and Attitudes

The items constituting the general value domains were saved as variables and correlated with the Kellert scales for each of the three groups (Table 1). Significant correlations were identified for several of the interactions, although none of the correlations is particularly strong. For *sheep farmers*, the "Security" value domain correlates somewhat with dominionistic, negativistic and utilitarian attitude scales. "Openness to change" correlates moderately with the more positive attitude scales: ecologistic, moralistic and naturalistic. The strongest correlations for this group are found between the "Nature" value domain and the naturalistic attitude scale (0.27), and between the "Tradition" value domain and the dominionistic (0.26) and negativistic (0.29) attitude scales. Self-enhancement correlates moderately (0.19) with the dominionistic and utilitarian attitude scales, while "Altruism" is almost uncorrelated with any of the attitude scales.

For the *environmental managers*, the strongest correlation (0.35) is found between the "Nature" value domain and

Table 1. Correlations between value domains and attitude scales.

	SHEEP FARMERS					
	Dominionistic	Ecologistic	Moralistic	Naturalistic	Negativistic	Utilitarian
Security	0.16	-0.08	0.04	-0.08	0.12	0.15
Openness to change	-0.13	0.13	0.16	0.18	-0.18	-0.13
Nature	-0.15	0.20	0.14	0.268	-0.001	-0.07
Tradition	0.26	-0.11	0.12	-0.04	0.29	0.23
Self-enhancement	0.19	-0.12	0.08	-0.12	0.25	0.19
Altruism	-0.04	0.06	-0.09	-0.03	0.01	-0.02
N	415	414	415	414	415	412
	ENVIRONMENTAL MANAGERS					
	Dominionistic	Ecologistic	Moralistic	Naturalistic	Negativistic	Utilitarian
Nature	-0.05	0.27	0.18	0.35	-0.16	-0.21
Openness to change	-0.03	0.21	0.14	0.21	-0.12	-0.09
Security	0.16	-0.05	-0.08	-0.08	0.13	0.14
Altruism	-0.08	0.21	0.19	0.07	0.02	-0.08
Tradition	0.21	-0.06	-0.06	-0.09	0.17	0.18
Self-enhancement	0.11	-0.04	0.04	-0.04	0.09	0.03
N	374	375	374	374	375	375
	RESEARCHERS					
	Dominionistic	Ecologistic	Moralistic	Naturalistic	Negativistic	Utilitarian
Nature	-0.10	0.31	0.30	0.40	0.01	-0.24
Openness to change	0.11	0.09	0.03	0.16	-0.09	-0.05
Tradition	0.29	-0.16	-0.12	-0.08	0.20	0.23
Security	0.08	0.03	-0.01	-0.20	0.17	-0.01
Altruism	0.06	0.03	0.08	0.08	0.03	-0.09
Self-enhancement	0.23	0.06	-0.08	0.06	0.17	0.18
N	197	197	197	197	197	197

Correlations above .18 are significant at $p<.01$

the naturalistic attitude scale. Correlations are also found for the ecologistic (0.27) and moralistic (0.18) attitude scales. The "Nature" value domain is slightly negatively correlated with the negative attitude scales: dominionistic, negativistic and utilitarian sub-scales. "Openness to change" shows roughly the same pattern as the "Nature" value domain, but the correlations are weaker. "Altruism" is somewhat correlated with the ecologistic attitude, and "Tradition" with the dominionistic scale for this group, but other than that, "Altruism," "Self-enhancement" and "Tradition" show only weak associations with the attitude scales.

Like the other two groups, *researchers* report a distinct correlation (0.40) between the "Nature" value domain and the naturalistic attitude scale. The ecologistic attitude scale also correlates with the "Nature" value (0.31). Generally, "Openness to change" and "Nature" correlate positively with the positive attitude scales (ecologistic, moralistic and naturalistic), and negatively with the negative attitude scales (dominionistic, negativistic, and utilitarian attitudes). "Tradition" correlates positively with the negative scales. Correlations between "Tradition" and the positive attitude scales are negative, but fairly weak. Security is somewhat correlated with the naturalistic and negativistic scales, while "Altruism" is almost uncorrelated with any of the scales. "Self-enhancement" correlates primarily with the negative scales (dominionistic, negativistic, and utilitarian attitudes), but like most of the correlations these are also quite moderate.

Discussion

The assertion that the conflicting groups in the livestock vs. large carnivore debate express distinctly different values receives limited support from the present study. Although several differences between the three occupational groups appeared at the single-item level, the general value structure showed only minor differences across the three groups. The six factors found to characterize the value clusters in the groups also corresponded well with previous analyses of values. The most important difference is that this study clearly distinguishes a biocentric or ecocentric value orientation that in earlier studies have tended to cluster with other value domains.

The "Openness to change" factor included the same value items as were identified by Stern and Dietz (1994), and by Schwartz's (1994) "Stimulation" and "Self-direction" categories. The "Self-enhancement" factor of the present study (authority, social power, wealth, influence) corresponds with the "Egoistic" value orientation identified by Stern and Dietz, and the Power/achievement motivational type in Schwartz's model. In accordance with Schwartz, we found evidence for at least two value types in the "Conservation" category (Security and Tradition), while Stern and Dietz identified one factor (Tradition) that contained these values.

As hypothesized, the present analysis revealed one separate factor (Nature) consisting of the ecocentric items (closeness to nature, unity with nature, biological diversity, protect the environment, a world of beauty). In Stern and Dietz's (1994) study these values grouped with altruistic value items to form a biospheric-altruistic factor, more in accordance with Schwartz's Self-transcendence value cluster. (In the present study, altruistic values (community, equality, freedom, justice) grouped together in a separate factor). A separate ecocentric value orientation has previously been hypothesized to be a potential, future result in particular populations "if radical environmentalists can succeed in socializing youth in a new value structure" (Gardner and Stern 1996, 65). Thus, it is of some interest that we identified this type of value orientation among farmers, wildlife managers, and research biologists in Norway. To some extent, it can be argued that these groups represent special interests, and a special type of interaction with the natural environment. They are not similar to the general population, yet they represent a wide diversity of backgrounds, geography, educational backgrounds and professional activities. Still, the study would certainly have been strengthened by similar measures among a sample of the general population.

Some differences among the three groups appeared on this common background of six value dimensions. It has been shown that an important predictor of attitudes toward large carnivores among sheep farmers is the farmers' personal anticipated consequence for future sheep farming if depredation continues (Vittersø et al. 1999b). Farmers have traditionally met the legal and cultural expectations to stay in their home area and maintain the family responsibility for the farm. That the "Security" value type is the single most important factor among the sheep farmers makes sense in this perspective. As shown in Table 1, sheep farmers have the highest scores on almost all single "Security" and "Tradition" items. Simultaneously, the ecocentric factor (Nature) is more important among the wildlife managers and the research biologists than among sheep farmers. On average, farmers express the same level of agreement as the other two groups on three of the Nature items (unity with nature, a world of beauty, closeness to nature), but a lower degree of agreement on two items (biological diversity, and protect the environment).

The importance of the "Security" and "Tradition" value items among sheep farmers, and of the "Nature" (ecocentric) value items among wildlife managers and research biologists is also reflected in the pattern of correlations between value factor scores and attitude toward large carnivores. Sheep farmers hold relatively negative attitudes (dominionistic, utilitarian, negativistic) toward large carnivores, while the attitudes among the two other groups are more positive (ecologistic, naturalistic, moralistic) (Kaltenborn et al. 1999). These previous findings make the associations between value factors and types of attitudes toward carnivores intelligible. We have shown that negative attitudes toward the large carnivores are positively associated with "Security" and "Tradition" values, and negatively associated with "Openness to change" (farmers only) and with "Nature" values (wildlife managers only). Positive attitudes toward the large carnivores are positively correlated with "Openness to change" and "Nature," and negatively correlated with "Self-enhancement" (farmers only).

However, attitudes are complex phenomena. Although the cognitive hierarchy framework posits a logic and connections between levels of psychological constructs, it does not defy the complex influence of diverse socio-demographic conditions. While we can identify relationships between general life values and attitudes toward carnivores, other factors may also be important for determining attitudes. We also explored the effect of age, education, gender and level of occupation on attitudes through a series of regression analyses. When all of these factors are entered as independent variables, we find a significant relationship with each of the six attitude scales. When considered separately, gender does not yield a significant effect on the moralistic, naturalistic, dominionistic, and utilitarian attitude scales. Age does not provide a significant contribution to the moralistic attitude scale. Hence, education and occupation are more salient factors than gender in the formation of the attitudes toward carnivores. However, when we assess the relative importance of occupation on the collective contribution of these socio-demographic conditions on attitudes, the effect of occupation does not alter the picture much. So, education, occupation, and age have an influence on attitudes, but they "act" in conjunction with one another.

Generally, this pattern of results indicate that negative attitudes toward large carnivores have as their value basis a concern for personal and family security, health, respect and loyalty for elders and traditions, and for economic income and social power. In contrast, positive attitudes toward carnivores seem to be related primarily to concern for the ecocentric values, but also to values like curiosity, excitement, and

variation in life. Aside from the few differences noted here, the three groups were remarkably similar.

Endnote

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2. Tables of distributions of mean scores, factor solutions and reliability tests are available from the authors upon request.

Acknowledgement

This work was financed by the Norwegian Research Council's program, Use and Management of Outlying Fields.

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