Scandinavian Journal of Psychology, 2024, 65, 452–468 DOI: 10.1111/sjop.12994

Empirical Article

Are different countries equally green with envy? A comparison of the everyday concept of envy in the United States, Spain, and Germany

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Schweiger Gallo, I., Görke, L. A., Alonso, M. A., Herrero López, R. & Gollwitzer, P. M. (2024). Are different countries equally green with envy? A comparison of the everyday concept of envy in the United States, Spain, and Germany. *Scandinavian Journal of Psychology*, *65*, 452 468.

Using a prototype approach to emotion concepts, we mapped the internal structure and content of the everyday concept of *envy* (as used in the United States) and its translation equivalents of *envidia* in Spanish and *Neid* in German. In Study 1 (total $N = 415$), the features of the concept of *envy*, *envidia*, and *Neid* were generated via an open-ended questionnaire. In Study 2 (total $N = 404$), participants rated the degree of typicality of the constitutive features on a forced-choice questionnaire. The prototype analysis of envy, supplemented with network analyses, revealed that the largest connected set of features of *envy*, *envidia*, and *Neid* shared a group of central features, including features related to success or to people with a better appearance. Still, *envy*, *envidia*, and *Neid* did differ with respect to their constituent peripheral features as well as the density of their networks, their structure, and the betweenness centrality of the nodes. These results suggest that a prototype approach combined with network analysis is a convenient approach for studying the internal structure of everyday emotion concepts and the degree of overlap with respect to the translation equivalents in different countries.

Key words: Envy, internal structure, network analyses, everyday emotion concept, prototype approach.

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INTRODUCTION

Envy is a common emotion in our everyday life, affecting both physical and psychological health (review by Smith & Kim, 2007). Despite a recent call to reconsider envy from a more elaborate perspective by taking into account that envy may be functional or dysfunctional depending on its particular circumstances (Lange & Protasi, 2021), envy has been traditionally linked to negative outcomes (Crusius, Gonzalez, Lange & Cohen-Charash, 2020) and has been associated with anxiety, negative mood, hostility, and a negative group atmosphere (Cohen-Charash, 2009), depression (Cohen-Charash, 2009; Fiske, 2010; Jiang & Wang, 2020), low self-esteem (Fiske, 2010), less helping and more harmful behavior (Behler, Wall, Bos & Green, 2020), and the contagion of unethical behavior in organizations (Thiel, Bonner, Bush, Welsh & Pati, 2020). It has also been reported to negatively predict positive affect and life satisfaction (Yanhui, Jiali & Qingyin, 2022) and prosocial behavior, even in adolescents (Yu, Hao & Shi, 2018). Also, research found that dispositional envy is negatively related to life satisfaction in undergraduate students (Milfont & Gouveia, 2009), as well as adolescents and young adults (Ng, Lau & Chen, 2020).

In a classic definition of envy, Parrott and Smith stated that envy "occurs when a person lacks another's superior quality, achievement, or possession and either desires it or wishes that the other lacked it" (Parrott & Smith, 1993, p. 906). Research on envy has confirmed the importance of social comparison processes for the experience of envy (e.g., Miceli & Castelfranchi, 2007; see discussion by Crusius, Gonzalez, Lange & Cohen-Charash, 2020). Specifically, upward social comparisons (Smith, 2000) with similar others (Protasi, 2016; Schaubroeck & Lam, 2004) in self-relevant domains (Smith, 2004) as well as the perceived inferiority do play a prominent role in the experience of envy (Ben-Ze'ev, 1992; Parrott & Smith, 1993; Protasi, 2016). DelPriore, Hill, and Buss (2012) explored, for example, the contexts that most frequently elicited envy. They observed in a college student sample that the domains centered on romantic attraction, physical attractiveness, financial resources, having status-related possessions, and academic success. In line with these findings, Rentzsch and Gross (2015) report that the most common experiences of envy in undergraduate students studying psychology refer to attraction (e.g., physical attraction), competence (e.g., exam scores), and wealth (e.g., money).

Two types of envy or unitary construct?

Though research on envy was still in its beginnings at the turn of the century (Smith & Kim, 2007) and little research addressed envy as compared with other feelings (Miceli & Castelfranchi, 2007), fortunately envy has attracted more research

attention over recent years. However, the field of envy research is characterized by the disagreements in conceptualizing envy (Crusius, Gonzalez, Lange & Cohen-Charash, 2020; Lange, Weidman & Crusius, 2018). Whereas some theories, referred to as "dual approach" (Crusius, Gonzalez, Lange & Cohen-Charash, 2020) or "dual envy theory" (Lange, Weidman & Crusius, 2018), distinguish between the two types of benign and malicious envy (e.g., Falcon, 2015), it has also been recommended to operationalize envy as an overarching construct ("general envy") with benign and malicious envy as subtypes (van de Ven, 2016). Within the stream of research suggesting a distinction between benign envy and malicious envy, the latter has been related to hostile feelings and reactions (Smith & Kim, 2007). It has been emphasized that there is more to envy than a mere maliciousness with dysfunctional consequences, as envy may also be associated with positive consequences and serve adaptive functions, such as motivating people to improve themselves (van de Ven, 2017). Both benign and malicious envy are unpleasant and frustrating, but benign envy is elicited in situations that are perceived as deserved and controllable, whereas malicious envy arises when something in another person is perceived as undeserved (van de Ven, Zeelenberg & Pieters, 2012).

Benign and malicious envy shift attention differently to environmental stimuli at early levels of processing and also have different motivational and behavioral consequences: Malicious envy shifts attention toward the envied person (Crusius & Lange, 2014), leads to less helping (Montal-Rosenberg & Moran, 2020) and to degrading the superior other (van de Ven, Zeelenberg & Pieters, 2009). Benign envy, on the other hand, positively predicts subjective well-being (Briki, 2019), shifts attention toward means to improve one's outcomes (Crusius & Lange, 2014), and is characterized by a positive motivation to improve oneself (van de Ven, Zeelenberg & Pieters, 2009) as long as this improvement is perceived as attainable (van de Ven, Zeelenberg & Pieters, 2011); it also increases respective risk taking (Kwon, Han & Nam, 2017).

Different motivational dynamics have also been reported at the trait level: Over multiple studies, Lange and Crusius (2015) suggested that dispositional benign envy was linked to hope for success leading to increased performance, whereas dispositional malicious envy was linked to fear of failure and thus to active disengagement from a given goal. Research by Lange, Paulhus, and Crusius (2018) suggests that there is more than a differentiation between benign and malicious envy in terms of positive versus negative consequences: Both types of envy were shown to be associated with the Dark Triad of personality (Paulhus & Williams, 2002), but whereas benign and malicious envy were both associated with Machiavellian tendencies, malicious envy was also linked to psychopathic behaviors.

Other research, however, proposes that envy is better conceived of in terms of one dimension ("unitary approach"; Crusius, Gonzalez, Lange & Cohen-Charash, 2020, or "malicious envy theory"; Lange, Weidman & Crusius, 2018). In line with the latter conceptualization, Cohen-Charash & Larson, (2017; see also the discussion by Crusius, Gonzalez, Lange & Cohen-Charash, 2020) advocated for considering envy as a unitary construct, arguing that a distinction between different types of envy is neither endorsed by theory nor supported by empirical findings. Envy is said to involve hostile feelings (e.g., Castelfranchi & Miceli, 2009) and pain (Tai, Narayanan & McAllister, 2012) as it activates a pain-related neural circuitry when the possessions of the envied person (e.g., abilities, qualities, and social status) are superior and the comparison is self-relevant (Takahashi *et al.*, 2009). Furthermore, it has also been suggested to integrate the approaches focusing on the hostility feature of envy ("malicious envy theory") and those on the feature of pain ("pain theory of envy") into the so-called pain-driven dual envy theory (Lange, Weidman & Crusius, 2018).

Delineating envy from other emotions

Earlier research has described envy as being constituted of various emotions (Cohen-Charash, 2009) and has explicated the relationship between envy and other emotions, such as admiration (Castelfranchi & Miceli, 2009; Cohen-Charash, 2009), jealousy (Fiske, 2010; Miceli & Castelfranchi, 2007; Quintanilla & Lopez, 2013; Smith & Kim, 2007), or anger (Fiske, 2010). More specifically, both envy and jealousy have long been regarded as synonyms (Foster, Apthorpe, Bernard *et al.*, 1972), and thus were often confused (Smith & Kim, 2007). However, whereas envy refers to the wish to possess what another person has (Foster, Apthorpe, Bernard *et al.*, 1972; Parrott & Smith, 1993) who is in a better position (van de Ven, 2016), jealousy implies losing what is already in one's possession. This is especially the case when it comes to losing one's relationship to another person, as jealousy is elicited by the perception of a threat to a relationship (Chung & Harris, 2018). Thus, as compared with jealousy where three elements are involved (i.e., oneself, the envied other, and the relationship one fears to lose), envy involves only the dyad of an envier and an envied person (Parrott & Smith, 1993). Given the difficulties to delineate envy from other feelings and thus to establish whether or not they are part of other feelings (Miceli & Castelfranchi, 2007), we deem a prototype approach as pertinent to analyze the content of the everyday concept of *envy*[1] as well as its translation equivalents in different countries. The prototype approach originated from research by Rosch (1973), who conceived of concepts as organized around prototypes rather than as having a number of necessary and sufficient defining attributes. A membership in a category is thus determined by resemblance, and members vary in the degree to which they are members (Russell, 1991). Accordingly, the border between categories is fuzzy (i.e., there are no sharp boundaries that separate members from non-members). Previous research on *gratitude* (Lambert, Graham & Fincham, 2009), *grima* (Schweiger Gallo, Fernández-Dols, Gollwitzer & Keil, 2017), *humiliation* (Elshout, Nelissen & van Beest, 2017), *love* (Fehr & Russell, 1991), *modesty* (Gregg, Hart, Sedikides & Kumashiro, 2008), *sadness* (Shirai & Nagamine, 2020), *shame* (Mendoza, Fernandez-Dols, Parrott & Carrera, 2010), *vengeance* (Elshout, Nelissen & van Beest, 2015), and even the concept of *emotion* itself (Fehr & Russell, 1984) has shown that a prototype approach allows for identifying the features of emotion concepts (i.e., unique or shared attributes), and thus to delineate their internal structures.

Identifying the internal structure of everyday emotion concepts is an important prerequisite for understanding emotion concepts,

and it allows for the delineation of emotion concepts from each other. Indeed, research discovered that disgust might be composed of different constructs (e.g., socio-moral disgust and core disgust; Simpson, Carter, Anthony & Overton, 2006). Even more so, cross-cultural research has suggested that disgust is not a homogeneous category of emotion, as words commonly translated as disgust may not refer to the same concept (e.g., the translations of disgust into Korean and Malayalam; Han, Kollareth & Russell, 2016).

Methodological approaches

In order to complement the theoretical debates about the conceptualization of envy, in the present research we explored the internal structure of the everyday concept of *envy* based on a novel methodological approach consisting of a combination of prototype and network analyses. Prototype analyses were expected to allow for capturing the features of *envy*, *envidia*, and *Neid*, as well as whether these features were conceived of as being central or peripheral. Further, the comparison of the features of the three emotion concepts of *envy*, *envidia*, and *Neid* should enable addressing to what extent the three emotion concepts share central and peripheral features, and thus do or do not refer to the same concept.

Importantly, as compared with traditional prototype research, we also used network analyses to explore the relevance of single features, as well as how they are connected to other features. In fact, network analyses were expected to be strategically helpful in disclosing the amount of dyadic connections of the different features of each emotion concept and its structural location (Hanneman & Riddle, 2005). Networks are composed of nodes and edges (i.e., relations between the nodes), and those nodes that are connected by an edge are conceptualized as neighbors (Easley & Kleinberg, 2010). Earlier research applying network analysis to social networks has, for example, conceptualized e-mail accounts as a set of nodes and e-mails as connecting these nodes (Gloor, Fronzetti Colladon, Grippa & Giacomelli, 2017), or phone users as nodes and communication between nodes as edges (Xu & Zhang, 2012). Importantly, in the last decade, network analyses have also been increasingly applied to psychological phenomena (Christensen & Kenett, 2021) in what has been known as psychological networks, with nodes representing psychological variables and edges statistical relationships (Epskamp & Fried, 2018).

Indeed, a network approach allows for conceiving psychological variables as related variables rather than as common causes or effects of the observed variables (Schmittmann, Cramer, Waldorp, Epskamp, Kievit & Borsboom, 2013). In this realm, nodes can represent psychological variables such as symptoms, with psychopathology networks representing the relations between the symptoms (Borsboom & Cramer, 2013). Psychological networks have also been applied in the field of social psychology, where nodes have been represented as evaluative reactions and the causal influences between the evaluative reactions as edges (Dalege, Borsboom, van Harreveld, van den Berg, Conner & Maas, 2015).

In our article, we focus on associations based on shared meaning (Doerfel, 1998; Doerfel & Barnett, 1999), as semantic networks do. Therefore, we draw on the logic of cognitive theories of associative structures (e.g., Collins & Loftus, 1975), which have been applied, for example, to reveal the cognitive structure of consumers via the visualization of semantic networks (Grebitus & Bruhn, 2008). Thus, we modeled the features of *envy* (and *envidia* and *Neid*) as associative networks by conceptualizing features as nodes and the links between nodes as representing associations between the features in order to assess the importance of the features within each of the networks.

THE PRESENT RESEARCH

We used an exploratory approach to address the definition, features, and physical correlates of the everyday concepts of *envy*, *envidia*, and *Neid*. We therefore relied on a prototype approach (Study 1) as this was expected to lay the foundations for uncovering via network analyses (Study 2) the structure of interconnections and relations between the features as well as the relevance of the single features of *envy* and its translation equivalents of *envidia* and *Neid*. Thus, we used network method techniques to analyze the structure of each of the emotion concepts and to gain new insights into the emotion concepts of *envy*, *envidia*, and *Neid*.

The aims of the present research were manyfold: We targeted the analysis of the definition, elicitors, and physical correlates of *envy* and of two of its translation equivalents (i.e., *envidia* in Spanish and *Neid* in German). Thus, we assessed the internal structure of *envy*, *envidia*, and *Neid* and explored whether and to what extent the features of *envy* and its translation equivalents relate to each other within the respective country and between countries. Indeed, given the rising concerns about the adequate assessment of emotion concepts via direct translations and their assumed conceptual equivalence (e.g., Han, Kollareth & Russell, 2016; Mendoza, Fernandez-Dols, Parrott & Carrera, 2010), we wondered to what extent the translations of the everyday emotion concept of *envy* (i.e., *envidia* and *Neid*) refer to a unitary emotion concept in cross-cultural research.

Previous research has analyzed envy experiences by providing a definition of envy and asking participants to list envy-eliciting situations (DelPriore, Hill & Buss, 2012); instructing participants to think back to an envy-eliciting situation and to list 10 elements (e.g., desires, verbalizations) associated with envy (Lange, Weidman & Crusius, 2018); asking for the description of a situation in which strong envy was felt and providing researcher-generated items (Parrott & Smith, 1993) or a list of affective states (Smith, Kim & Parrott, 1988); asking participants about situations in which they had specifically experienced either benign envy or malicious envy and to answer questions about the experiential content (van de Ven, Zeelenberg & Pieters, 2009, Study 1); and asking participants to write down a situation in which they experienced envy and to answer questions about benign and malicious envy (van de Ven, Zeelenberg & Pieters, 2009, Study 2) or to indicate whether they had experienced envy every day and to answer experiential content (van de Ven, Zeelenberg & Pieters, 2009, Study 3). In the present research, we followed a data-driven approach and explicitly examined the everyday concept of *envy* and its translation equivalents in three cultures, collecting features belonging to the

definition of the concept, as well as to envy-eliciting situations and bodily reactions, and analyzing the internal structure of each of the concepts of *envy* in terms of their respective central versus peripheral features. Instead of relying on US participants (DelPriore, Hill & Buss, 2012; Lange, Paulhus & Crusius, 2018; Parrott & Smith, 1993; Smith, Kim & Parrott, 1988; van de Ven, Zeelenberg & Pieters, 2009, Study 2) or Dutch participants (van de Ven, Zeelenberg & Pieters, 2009, Study 1) and Spanish participants (van de Ven, Zeelenberg & Pieters, 2009, Study 3) only, we compared the everyday concepts of *envy* in three cultures in each of the two studies of the present research. Based on previous research, we hypothesized that features belonging to inferiority, improvement motivation, longing for what another has (Lange, Weidman & Crusius, 2018; Parrott & Smith, 1993; Smith, Kim & Parrott, 1988), physical attractiveness, competence, and financial resources (DelPriore, Hill & Buss, 2012; Rentzsch & Gross, 2015) would be among the constituent central features of the concepts of *envy*. As these studies relied mostly on student populations (with the exception of the studies done by Lange and colleagues, who asked US employees to recall a situation in which they felt envy), we expected the envy features generated by our samples to align with those of previous research. Importantly, we did not explicitly mention benign versus malicious envy as our interest was in the everyday conceptions of *envy*. Previous research has suggested that some languages, such as Dutch, have different words for the positive and negative type of envy, respectively: *benijden* (benign envy) versus *afgunst* (malicious envy; van de Ven, Zeelenberg & Pieters, 2009). Therefore, we looked at two languages that are known to have only one word for envy (i.e., Spanish and English) and a language that has two words for the two different types of envy (i.e., German: *beneiden*[2] and *missgönnen*; Crusius & Lange, 2014) by using the direct translations that encompass both benign and malicious envy (i.e., *Neid* and *envidia*). Given that even though the Spanish language does not have a single word for a benign form of envy, Spanish speakers are used to speaking of "*envidia sana*" (see also Rodriguez Mosquera, Parrott & Hurtado de Mendoza, 2010), which is equivalent to benign envy, we hypothesized that the participants from Germany, Spain, and the United States would refer to both a positive and a negative form of envy and that this differentiation would also be reflected in the internal structure of *envy*, *envidia*, and *Neid*, respectively.

Finally, we also aimed at analyzing how envy relates to other feelings. Based on Shaver, Schwartz, Kirson, and O'Connor's (1987) hierarchy of English emotion terms in which the *anger* category was found to contain a subcategory of *envy* and *jealousy*, as well as previous research linking envy to jealousy and anger (e.g., Fiske, 2010), we hypothesized that English speakers would relate *envy* to *jealousy* and *anger*. As most research so far has been done with English speakers, and less so with German (e.g., Crusius & Lange, 2014) or Spanish (e.g., van de Ven, Zeelenberg & Pieters, 2009) speakers, and the relationship to other emotions has been explicitly excluded in previous research (e.g., Lange, Weidman & Crusius, 2018), we made no specific predictions for *envidia* and *Neid* regarding their relationship to other everyday emotion concepts.

In order to maximize statistical power in both studies, we based the sample size on previous research. The sample size used in Study 1 was expected to allow for the generation of sufficient features, and thus to reflect adequately the characteristic features of *envy*, *envidia*, and *Neid*. In Study 2, we targeted a similar sample size as in Study 1, as a total N of more than 400 participants would allow detecting an anticipated medium effect size of $f = 0.15$.[3]

STUDY 1: ASSESSING THE CHARACTERISTIC FEATURES OF *ENVY*, *ENVIDIA*, AND *NEID*

Method

Participants. One-hundred and seventeen US participants (84 females; mean age $M = 19.44$, $SD = 1.67$), 133 Spanish participants (94 females; mean age $M = 20.42$, $SD = 2.33$), and 165 German participants (144 females; mean age $M = 20.76$, $SD = 3.70$) contributed data. Participants were mainly undergraduate or graduate students and participated voluntarily, received course credit or financial compensation. Only those data stemming from participants who were fluent in English, Spanish, or German, respectively, were considered. The Spanish-speaking participants were recruited in their respective classes, whereas German-speaking and English-speaking participants were invited through the usual online recruitment system at their respective universities. Participants gave their consent after being informed of the nature of the study.

Materials and procedure. First of all, participants were asked to define *envy* or the translation equivalent of *envidia* or *Neid*. These translation equivalents have been used in past cross-cultural research on envy (e.g., *Neid*: Crusius & Lange, 2014; *envidia*: Rodriguez Mosquera, Parrott & Hurtado de Mendoza, 2010). Next, participants listed the elicitors of *envy* ("Are there any situations or objects that make you feel envy?"). More specifically, participants were asked to stop either after a minute or after having listed 10 elicitors. Participants also described their bodily reactions when experiencing *envy*/*envidia*/*Neid*.

As compared with previous research on envy, in the present research participants were asked about the definition of *envy* in order to capture not only the features of *envy*, but also how the everyday concept of *envy* relates to other emotions, as this was explicitly excluded in other research. Further, we also asked about bodily reactions, including facial expressions. These questions, extracted from previous prototype research or research on envy, were expected to allow for assessing the causes or objects of envy (Rodriguez Mosquera, Parrott & Hurtado de Mendoza, 2010; Russell & Fehr, 1994) and also to provide insights into the definition of the emotion concept (e.g., Mendoza, Fernandez-Dols, Parrott & Carrera, 2010) and to capture the behavioral reactions (Russell & Fehr, 1994) of envy. As in previous research based on prototype approaches, we chose to dismiss guided questions about the relationship to other emotions or the regulation of feelings of envy in order to capture the everyday concept without pointing to specific aspects of the concept and thus compromising the spontaneous generation of the features of the respective everyday concepts. Finally, all participants were asked to provide demographic information and were thanked or thanked and compensated.

Preliminary data reduction

Based on Fehr's (1988) procedure, which has been proven effective for coding features of everyday emotion concepts (e.g., Lambert, Graham & Fincham, 2009; Mendoza, Fernandez-Dols, Parrott & Carrera, 2010; Schweiger Gallo, Fernández-Dols, Gollwitzer & Keil, 2017), two independent coders with the same background in the language at hand performed a category analysis for each of the three questions: the definition, elicitors, and physical reactions of *envy* and its translation equivalents *envidia* and *Neid*. First, the participants' responses were organized into minimally inclusive linguistic units. Responses such as "Envy is an emotion in which you want something that another person has" were, for example, divided into the linguistic units of "emotion," "want something," "that another person has." These linguistic units were then grouped together into one category whenever the grammatical form of the listed features was identical or almost identical (e.g., a verb inflected in different tenses, plural and singular forms of a noun, etc.), when they were modified by adjectives, or identical in meaning. "That another individual has," "that another person has," "that other people have," and "that others have" were, for example, subsumed into one category. In cases in which the two coders did not agree, consensus was reached by discussion.

The extraction of attributes yielded 376 linguistic units for the definition of *envy*, 635 linguistic units for *envidia*, and 809 linguistic units for *Neid*, which were grouped into 93, 139, and 151 categories, respectively. The coding procedure also yielded a total of 448 elicitors of *envy*, 449 of *envidia*, and 668 of *Neid*. These linguistic units were sorted into 84 categories for *envy*, 86 categories for *envidia*, and 72 categories for *Neid*. Finally, 66 categories of physical responses of *envy*, 76 of *envidia*, and 86 of *Neid* were created out of 247, 257, and 347 linguistic units, respectively.

Results and discussion

We focused on the linguistic units referred to by at least 10% of the respondents of any of the three samples (see Table 1).[4] Consistent with the literature on envy highlighting the importance of social comparison processes (Boecker, Loschelder & Topolinski, 2022; Miceli & Castelfranchi, 2007; Moyal, Motsenok & Ritov, 2020; van de Ven & Zeelenberg, 2020), such processes were mentioned by participants of all three countries ("what another person has" and "what you do not have"), as well as the desire to have what the other possesses, expressed either as a wish (Spanish and US participants) or as referring to what one would like to have (German and Spanish respondents). Indeed, Fiske (2010) already suggested that a wish to possess something underlies envy. Our finding is also consistent with previous research, in which feeling wishful was among the most characteristic elements in descriptions of envy (Parrott & Smith, 1993), and with experimental research suggesting that negative social comparisons not only induce envy but also lead to impulsive behavioral approach tendencies to acquire the desired good in people with limited self-control capacity (Crusius & Mussweiler, 2012) and to prevent others from obtaining their desired resources (Moyal, Motsenok & Ritov, 2020).

Table 1. *Percentage of constitutive features of envy*, *envidia*, and *Neid* mentioned by at least 10% of the participants (Study 1)

	Frequency of mentions for		
Features	*Envy*	*Envidia*	*Neid*
Definition			
Jealousy	54%		
What someone else has	49%	16%	36%
Wish	42%	33%	
Wanting something	33%		
Refers to what you also would like to have		22%	60%
Not having	13%	17%	21%
Another person who has something, you do not	10%	26%	
Comparison with others			19%
Refers to another person		21%	35%
Owning something			17%
Refers to something			14%
Refers to something material		13%	
What you would like to be able to do			12%
Feeling		56%	18%
Emotion		17%	
Good		12%	
Not begrudging			41%
Negative		23%	
Bad		10%	
Negative feeling			13%
Physical reactions			
Tensing up	21%		18%
Changes in temperature	21%		10%
Anger	17%	37%	10%
Symptoms in the stomach	12%		25%
Sadness	12%		
Increased heart rate	11%		16%
Changes in the face		19%	16%
Nervousness		12%	
Elicitors			
Money	31%	31%	16%
Academic success	31%	11%	18%
Physical appearance	26%		27%
Relationships	23%		21%
Talent	21%	19%	26%
Success	17%		
Character traits	15%	25%	16%
Traveling	12%	25%	25%
Friendship	12%		10%
Clothes and accessories	10%		18%
Intelligence	10%		
Social skills			19%
Cars		19%	
Having a nice figure			15%
Better grades with less effort		13%	
Achieving something with less effort		17%	12%
Home			12%
Technology		11%	
Family		11%	
Job		11%	
Luck		11%	10%
Time		10%	
Food			10%

The participants of all three countries also related *envy* mostly to money, academic success, talent, character traits, and traveling, albeit to different degrees. These findings are in line with research

by Navarro-Carrillo, Beltrán-Morillas, Valor-Segura, and Expósito (2017), who found that personal skills/competences such as intelligence, social skills, and success were most frequently referred to with 33% of the mentions in a sample of adult participants, followed by work and/or academic issues (e.g., grades, performance on exams). Our data also fit nicely with those by Rodriguez Mosquera, Parrott, and Hurtado de Mendoza (2010), who found that the most common source of envy in a student sample was academic achievement, as well as with those by DelPriore, Hill, and Buss (2012), Rentzsch and Gross (2015), and Henniger and Harris (2015), who found that scholastic success was reported mainly by young people. As regards the physical reactions, the participants from all three countries reported anger responses. This result is consistent with previous research pointing to the relationship between envy and anger, such as the anger experienced by adolescents with scarce resources regarding interpersonal relationships (Poelker, Gibbons, Maxwell & Elizondo-Quintanilla, 2017).

Further features of *envy*, *envidia*, and *Neid* for the definition, elicitors as well as the physical symptoms were generated by the participants of two countries or one country only (e.g., it was said to cause nervousness by Spanish participants only). Contrary to our predictions, only Spanish participants characterized *envidia* as negative (23%; e.g., "negative quality"), good (12%; e.g., "envy can be good"), and bad (10%; e.g., "can be bad") and thus referred to both a positive and a negative form of envy. Finally, only US participants related *envy* to jealousy and sadness. Thus, consistent with our third assumption, English speakers linked *envy* to jealousy and anger, whereas German and Spanish speakers did not relate the translation equivalents of *envy* to jealousy, but to anger.

STUDY 2: INTERNAL STRUCTURE OF *ENVY*, *ENVIDIA*, AND *NEID*

In Study 2, we targeted the analysis of groups of features within *envy*, *envidia*, and *Neid*, as well as the relationship between features and the relevance of the respective features. Therefore, we relied on both a prototype and a network approach to unravel the internal structure of the everyday concept of *envy* and its translation equivalents within and between the three countries.

Method

Participants. One-hundred and twenty-two US participants (93 females; mean age $M = 19.50$, $SD = 3.56$), 158 Spanish participants (109 females; mean age $M = 28.41$, $SD = 13.43$), and 124 German participants (98 females; mean age $M = 21.99$, $SD = 5.61$) contributed data. Participants were mainly undergraduate or graduate students. They gave their consent after being informed of the nature of the study and received course credit or financial compensation or participated voluntarily. German-speaking and English-speaking participants were invited through the usual online recruitment system at their respective universities, whereas Spanish-speaking participants were recruited in their classes or by using a snowball sampling method.

Materials and procedure. Participants were given a forced-choice questionnaire containing the 51 items extracted from Study 1. These items were taken from those categories mentioned by at least 10% of the participants in each country. Statements referring to the definition and elicitors of *envy*/*envidia*/*Neid* were framed as "Envy refers to/is…" or "Envy is caused by…" whereas the physical reactions were described as "Envy causes…." Each item was worded in terms of the most frequent description within the respective category, and whenever the feature was mentioned by participants from two or three countries, the item was extracted from the country with the highest number of mentions. "Anger," for example, was mentioned by participants in all three samples; as it was more frequently mentioned by Spanish participants (37%) than by US (17%) or German participants (10%), this item was selected among the linguistic units extracted from the responses of the Spanish participants.

Participants were asked to indicate the extent to which they considered each of the statements as being typical of the envy concept. They were told that whereas the number "0" indicated that the statement was not typical of envy, the number "5" indicated that it was more or less typical, and "10" meant that it was very typical. The items were listed in random order.

Results and discussion

First, we mapped the structure of *envy*, *envidia*, and *Neid*, respectively, by computing the network metrics of community detection and betweenness centrality. These measures allowed for analyzing the main groups and subgroups that comprised each of the emotion concepts at a meso-structure level, as well as the relevance of the position of the features (i.e., betweenness centrality; Freeman, 1978). Further, we assessed which of the features of the main communities detected in the everyday emotion concepts of *envy*, *envidia*, and *Neid* were considered to be central as opposed to peripheral. In a final step, we compared the ratings of prototypicality between *envy*, *envidia*, and *Neid*.

Network analyses. We generated three matrixes, one for each country.[5] Each matrix is an undirected, valued network based on zero-order correlations and composed of a set of nodes (features of *envy*, *envidia*, or *Neid*, respectively), and of a set of ties connecting these nodes. The nodes were conceptualized as features of the respective networks and thus were expected to represent shared meaning (Doerfel & Barnett, 1999). Following Collins and Loftus (1975), the ties in a semantic network will represent the similarity (i.e., there will be more links between nodes the more properties are shared) and strength (i.e., accessibility of the links in the path) of the association between the nodes.

First of all, we calculated the density of each of the networks. Density is usually defined as the sum of the values of all ties divided by the number of all possible ties (Hanneman & Riddle, 2005) and relates to the cohesion of the network (Benítez-Andrades, García-Rodríguez, Benavides, Alaiz-Moretón & Rodríguez-González, 2020). For instance, highly related topics and key words have been reported to be indicators of dense semantic networks (Lee, Lee, Kim & Lee, 2013).

Further, one of the structures suitable for analysis is that of connected groups of nodes (i.e., communities) within a larger network. The analysis of communities serves to identify the groups of nodes that are characterized by dense connections within each community as compared with the groups of nodes with fewer connections between communities (Girvan & Newman, 2002; Newman & Girvan, 2004). Within one community, nodes tend to share features and/or play similar roles (Fortunato, 2010). In phonological networks, for example, a community detection technique known as the Louvain method revealed that words that shared similar phonological segments clustered in each community (Siew, 2013). In contrast, groups of nodes are characterized by their lower similarity with respect to nodes of different communities (İlhan, Gündüz-Öğüdücü & Etaner-Uyar, 2014), with which they are related with loose connecting nodes between them (Girvan & Newman, 2002; Murata, 2010). Detecting communities (e.g., communities of researchers working in a specific field; Girvan & Newman, 2002) bears the methodological advantage of allowing to analyze the structure of networks at an intermediate level of analysis (i.e., densely connected subgraphs) and unraveling relationships between the nodes that may not be apparent at other levels of analyses (Lancichinetti, Kivelä, Saramäki & Fortunato, 2010).

In order to detect communities within each of the networks (i.e., to identify subtypes of related cases; see Figs. 1–3 for layouts generated using the algorithm of Kamada & Kawai, 1989), we relied on the Louvain optimization method as it has been shown to have good quality in detecting communities and to be more accurate than other community detection methods in terms of modularity (Blondel, Guillaume, Lambiotte & Lefebvre, 2008). The size of the largest connected component suggests that the conceptualization of the *disgust* concept encompasses several features that are connected to each other and can be reached through other features (i.e., nodes). Thus, the features within each community are related to each other, and larger communities represent greater cohesiveness. In line with past research, we established $\theta = 0.5$ as the threshold (e.g., Xu & Zhang, 2012).

Next to discovering the communities within each of the concepts, and in order to analyze the network at the node level, we also calculated an essential index of social network analyses (Grebitus & Bruhn, 2008): betweenness centrality (Freeman, 1978). Betweenness centrality allows for gaining insights into "the structural importance or prominence of a node in the network" (Borgatti, Mehra, Brass & Labianca, 2009, p. 894). This centrality index describes the relevance of a node due to its position with respect to other nodes (i.e., the importance of a node between two other nodes; Epskamp, Borsboom & Fried, 2018) and refers to the shortest path between various parties (Butts, 2008). Returning to the example of e-mail networks, an employee with a high betweenness centrality would act as an intermediary in the information flow between other actors (Gloor, Fronzetti Colladon, Grippa & Giacomelli, 2017). As betweenness centrality serves to assess the probability of getting activated or activating other features (Grebitus & Bruhn, 2008), it was expected to allow for assessing the role of the features of the everyday concept of *envy* (and its translation equivalents) as intermediaries between nodes. Standardized measures range from 0 to 1 (i.e., when a node is situated on all shortest paths).

The mean network density of the US network was $D = 0.11$. It was the lowest of the three networks and thus less connected, with features showing a lower level of linkage among all possible connections (Zhang, 2010). Applying the Louvain algorithm, we identified six groups of nodes. The largest connected community contained 19 vertices (i.e., nodes; 37.26% of the network). This main community comprised three subgroups: one subgroup included 12 features pertaining to elicitors and interpersonal relationships (e.g., people who have a big and close family, people with lots of money), as represented by an orange color in Fig. 1. Importantly, the feature of better appearance showed the highest betweenness centrality of this network ($C_B = 0.04$). As betweenness centrality relates to the potential to connect pairs of nodes that are otherwise not connected with each other (Zhang, 2010), it represents the position of specific features as intermediaries between other features. Thus, the feature of better appearance had the strongest position within the network, with more nodes (i.e., features) linked to it than any other feature. Attached to this subgroup was a second smaller subgroup of two features (yellow color): people with a special talent such as singing well and people with a happy relationship, with the latter feature showing the highest betweenness centrality of this subgroup ($C_B = 0.01$). In addition, the main community included a third subgroup (blue color) of five achievement-related features (e.g., people getting a better grade than you, $C_B = 0.01$). Next to this main community, a second community (light pink color) contained eight features related to physical symptoms and characteristics (e.g., anger, $C_B = 0.01$). Another community (black color) of six features contained features related to whether or not having something (e.g., refers to another person who has something, $C_B = 0.007$), and the last community included the two features of people with willpower and to not begrudging someone something (light grey color).

The mean network density of the Spanish network was $D = 0.14$. The analysis of the community structure revealed that the size of its largest group was greater than the largest group in the US network (22 vertices, 43.14%), and that the network included five differentiated communities: the main community was composed of three smaller subgroups and included the features with the greatest betweenness centrality of the whole network. The elicitors of *envidia* were located in different subgroups within this main community, including a group with 11 features (lilac color in Fig. 2) articulated around the features of people with a nice home ($C_B = 0.02$) and people with a state-of-the-art mobile phone ($C_B = 0.02$). Also within the main community, a subgroup of six features referred mostly to interpersonal relationships (e.g., people with lots of friends, people with a happy relationship; yellow color) and included the feature of successful people, which showed the highest betweenness centrality of the whole network ($C_B = 0.04$). Within a third subgroup of five features referring to achievement and grades (light green color), the feature of people getting a better grade than you ($C_B = 0.02$) showed higher betweenness centrality scores than the remaining features. Further, another community with six features contained physical aspects (e.g., increased heart rate, $C_B = 0.005$; light grey color), while two other communities

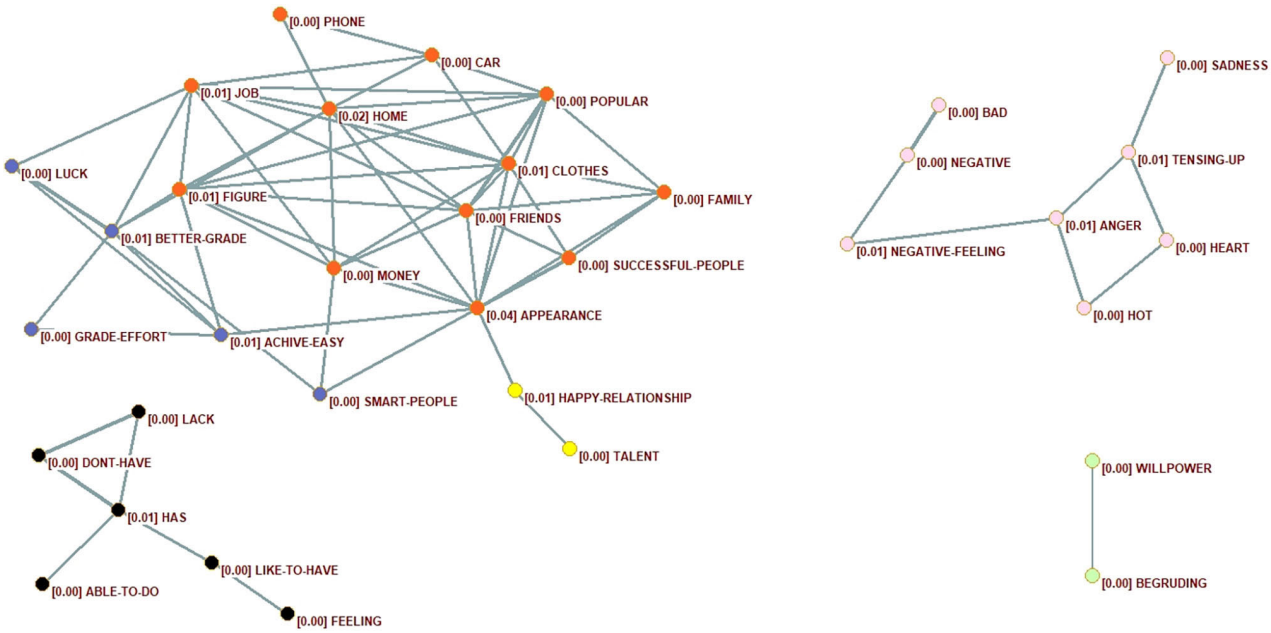

Fig. 1. Associative network for the United States with centrality ratings (Study 2). *Note*: Only connections that are significant at $p < 0.05$ are shown. Nodes belonging to one and the same community are given the same color.

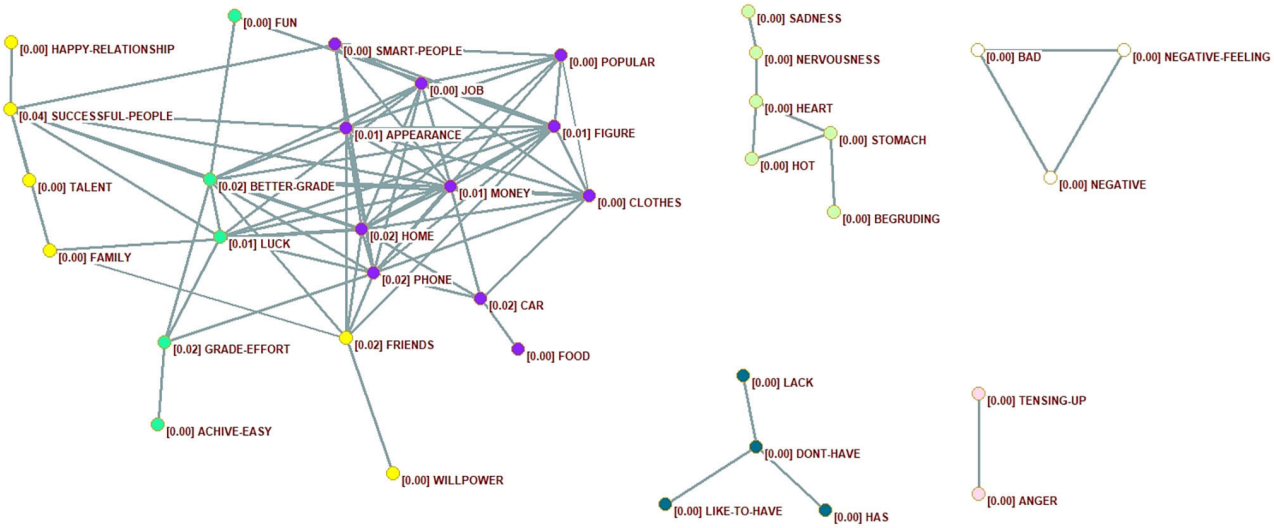

Fig. 2. Associative network for Spain with centrality ratings (Study 2). *Note*: Only connections that are significant at $p < 0.05$ are shown. Nodes belonging to one and the same community are given the same color.

contained the features related to something negative (negative, bad, negative feeling; white color) and related to having something or not (e.g., refers to what you do not have, refers to what you also would like to have; blue color), respectively. One final community included two features referring to tensing up and anger (pink color).

Finally, the mean network density of the German network was $D = 0.15$ and thus the highest of all three networks, showing the greatest cohesion of the networks. The size of the largest group was also higher compared with the Spanish and US networks (27 vertices, 52.94%). A total of seven communities were extracted: similar to the Spanish network, all features with the greatest betweenness centrality were located in a main community comprising four subgroups: two of the features, people who get a better grade than you with less effort ($C_B = 0.04$) and people with nice clothes ($C_B = 0.03$), were located within a subgroup of 11 features referring to elicitors and achievement (as represented by the lilac color in Fig. 3). Another feature with the highest betweenness centrality was located within a subgroup of six features referring mainly to elicitors and to having something or not (red color): the feature of people with a nice home ($C_B = 0.06$) had the strongest position within the network, with more nodes (i.e., features) linked to it than any other feature. Thus, the feature of nice home had a higher probability of getting

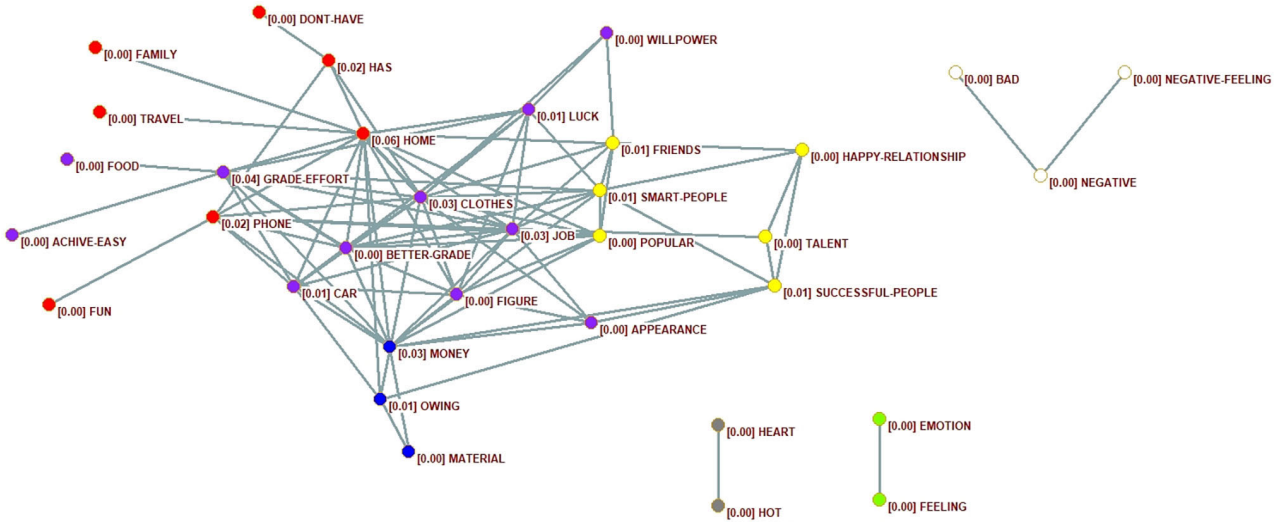

Fig. 3. Associative network for Germany with centrality ratings (Study 2). *Note*: Only connections that are significant at $p < 0.05$ are shown. Nodes belonging to one and the same community are given the same color.

activated or controlling the access to other features than all other features of the three networks. Another subgroup of three features was organized around the feature of people with lots of money ($C_B = 0.03$) and included features referring to possessions (blue color). A final subgroup of six features referred to interpersonal relationships and social aspects (e.g., smart people, $C_B = 0.01$; yellow color). With respect to the other communities, one with three features referred to the negative character of *Neid* (negative, $C_B = 0.001$; white color), whereas another community with two features included emotion and feeling (green color), and the last community included two physical symptoms: racing heart and feeling hot (grey color).

Prototypicality of central and peripheral features. In a next step, we assumed that the features would differ in their representativeness to the concept and thus tackled the prototype structure of the concept of *envy* and its translation equivalents by addressing the typicality of the features. Therefore, we first analyzed the ratings given to each of the features in Study 2 before comparing the features identified by the network analyses.

In order to divide the features of the everyday concepts of *envy* into central and peripheral features, we used the standard procedure by Fehr (Fehr, 1988; see also other prototype research such as Elshout, Nelissen & van Beest, 2015, 2017; Lambert, Graham & Fincham, 2009 and Shirai & Nagamine, 2020). Using this procedure, we found that 26 features of the English *envy* received ratings higher than 6.25 and thus were considered central to *envy* (see Table 2). With respect to *envidia*, those features with ratings higher than 5.98 were considered central to *envidia*. This procedure yielded 28 central features, whereby only two features received ratings higher than 8 points. Finally, 25 features of the German *Neid* higher than 6.04 were regarded as being central.

To further analyze how the features of the main community of each network related to one another, in a last step we identified the features that had been extracted via network analyses and subjected them to one-way ANOVAs (see Table 3). One-factorial ANOVAs revealed that the participants from all three countries did not differ with respect to the ratings given to the central features of successful people, people with lots of luck (all Fs <1), or people with a better appearance, $F(2, 401) = 2.24$, *n.s.*; people with a good job, $F(2, 401) = 1.65$, *n.s.*; people with a nice figure, $F(2, 401) = 1.53$, *n.s.*; people with lots of money, $F(2, 401) = 2.26$, *n.s.*; and better grade than you with less effort, $F(2, 401) = 2.05$, *n.s.* A marginal significant difference was found for the feature of achieving something with great ease that does not come as easily to you, $F(2, 401) = 2.49$, $p = 0.08$, with post hoc comparisons revealing that Spanish participants considered this feature as marginally less prototypical than US participants.

With regard to the peripheral features, no differences were found for people with a happy relationship, people who are given a new car, people who are popular, people with nice clothes, or people getting a better grade than you, all Fs <1, nor people with lots of friends, $F(2, 401) = 1.11$, *n.s.*, or smart people, $F(2, 401) = 1.78$, *n.s.* In contrast, US participants gave higher ratings for the feature of people with a nice home than Spanish and German participants, $F(2, 401) = 3.77$, $p = 0.02$. Importantly, this was the only node with a higher betweenness centrality in all three networks. US participants also scored higher than Spanish participants on the feature of people with a special talent such as singing well, $F(2, 401) = 3.36$, $p = 0.04$. Differences were also found in the ratings of people who have a big and close family, $F(2, 401) = 4.34$, $p = 0.01$, with Spanish participants scoring lower than US participants, as well as with respect to people with more tasty food, $F(2, 401) = 2.51$, $p = 0.08$, where German participants gave higher ratings than US participants. Finally, Spanish participants considered the feature of people with a state-of-the-art mobile phone, $F(2, 401) = 4.93$, $p = 0.01$, as more prototypical than German participants. Thus, whereas the central features of the main group of features of the everyday concept of *envy* and its translation equivalents did not differ between countries, peripheral features of *envy* (or *envidia* or *Neid*) received different ratings of prototypicality.

Table 2. *Mean typicality ratings of the features of envy*, *envidia*, and *Neid* clustered by prototypicality (Study 2)

	Concept		
Features	*Envy* *M* (*SD*)	*Envidia* *M* (*SD*)	*Neid* *M* (*SD*)
Comparison with others	8.53 (2.20)	8.34 (2.43)	9.08 (1.68)
Also would like to have	8.48 (1.71)	8.15 (2.24)	8.54 (2.00)
Feeling jealous	8.45 (2.07)	6.84 (3.30)	5.44 (3.18)
Feeling	8.41 (2.03)	7.53 (2.72)	8.03 (2.41)
What you do not have	8.33 (1.96)	7.22 (2.92)	6.50 (3.18)
Emotion	8.28 (2.20)	5.85 (3.30)	7.69 (2.64)
What someone else has	8.02 (1.92)	7.88 (2.29)	7.16 (2.39)
Negative	7.98 (2.20)	7.53 (2.64)	7.19 (2.65)
Another has something, you do not	7.97 (2.12)	7.65 (2.69)	7.98 (2.14)
Negative feeling	7.93 (2.31)	7.42 (2.64)	7.63 (2.63)
Wanting something	7.84 (2.32)	7.43 (2.52)	7.91 (2.16)
Achieve with great ease, comes not as easily to you	7.72 (2.35)	7.05 (2.71)	7.23 (2.47)
Would like to be able to do	7.64 (1.98)	7.05 (2.74)	6.37 (2.83)
Refers to something	7.48 (2.54)	6.78 (2.82)	7.98 (2.41)
Better grade than you with less effort	7.12 (2.52)	6.70 (2.77)	6.44 (2.74)
People with a nice figure	7.06 (2.68)	6.47 (2.99)	6.64 (2.77)
People with lots of money	7.00 (2.58)	6.52 (3.13)	6.22 (2.94)
Bad	6.96 (2.42)	7.78 (2.36)	6.31 (2.86)
People with a better appearance	6.93 (2.46)	6.23 (2.95)	6.46 (2.70)
Another person	6.92 (2.53)	7.61 (2.63)	7.23 (2.76)
Wish	6.64 (2.43)	7.34 (2.59)	7.80 (2.24)
Sadness	6.63 (2.47)	6.06 (2.81)	6.13 (2.66)
People with lots of luck	6.43 (2.93)	6.32 (3.17)	6.65 (2.74)
Successful people	6.39 (2.57)	6.33 (3.07)	6.29 (2.76)
People with a good job	6.38 (2.73)	6.68 (2.94)	6.06 (2.73)
People getting a better grade than you	6.38 (2.57)	6.19 (3.04)	5.89 (2.82)
Smart people	6.17 (2.51)	5.56 (2.97)	5.75 (2.52)
Cannot go out to have fun, but your friends can	6.11 (2.78)	5.28 (2.96)	4.63 (2.94)
People with a nice home	5.96 (2.56)	5.18 (3.09)	5.06 (2.66)
Anger	5.93 (2.80)	6.89 (2.68)	5.41 (2.72)
Tensing up	5.90 (2.78)	7.50 (2.49)	7.05 (2.59)
People who are popular	5.85 (2.84)	5.67 (3.16)	5.99 (2.94)
Travels to a place where I also wanted to travel	5.84 (2.61)	5.70 (3.05)	5.85 (2.93)
People with lots of friends	5.48 (2.73)	5.01 (3.06)	5.01 (2.95)
People who are given a new car	5.47 (2.94)	5.11 (3.11)	4.95 (3.12)
People with a special talent such as singing well	5.37 (2.66)	4.61 (3.00)	5.33 (2.70)
Something material	5.35 (2.33)	5.53 (2.93)	4.58 (2.81)
People with nice clothes	5.34 (2.45)	4.95 (3.05)	4.97 (2.74)
People with a happy relationship	5.33 (3.03)	4.97 (3.34)	5.18 (3.06)
People who have a big and close family	5.05 (2.79)	4.05 (3.01)	4.73 (2.93)
Ugly face	5.04 (2.97)	6.30 (2.56)	4.47 (2.81)
Owning something	4.74 (2.88)	5.92 (3.00)	5.27 (2.91)
Nervousness	4.37 (2.98)	5.47 (2.96)	4.35 (2.79)
Feeling hot	4.37 (2.89)	2.35 (2.65)	2.78 (2.48)
People with a state-of-the-art mobile phone	4.20 (2.72)	4.77 (3.31)	3.65 (2.84)
Not begrudging someone something	4.04 (2.62)	3.18 (2.91)	5.41 (3.35)
Racing heart	4.02 (2.72)	3.63 (3.12)	3.51 (2.82)
People with willpower	3.82 (2.64)	4.30 (3.16)	4.58 (2.75)
People with more tasty food	3.72 (2.83)	4.06 (3.08)	4.58 (3.16)
Stomachache	2.98 (2.71)	2.46 (2.52)	2.96 (2.77)
Good	2.34 (1.99)	2.84 (2.50)	2.59 (2.24)

GENERAL DISCUSSION

Envy is considered to be one of the seven deadly sins according to the Catholic church and has been reported to be the second sin a sample of members of various churches personally most struggled with (Capps & Haupt, 2011). Importantly, however, there is still disagreement about the nature, conceptualization, and outcomes of envy (Crusius, Gonzalez, Lange & Cohen-Charash, 2020). In the present research, we addressed how three different cultures think of *envy* as a concept and thus specifically analyzed the constituent features and internal structure of *envy* by systematically mapping the everyday concept of *envy* in three Western countries within two studies. Following previous prototype analysis of everyday emotion concepts such as *sadness* (Shirai & Nagamine, 2020) or *hope* (Luo, van Horen, Millet & Zeelenberg, 2022), we used a prototype approach to address the emotion concept of *envy* and its translation equivalents but supplemented it with network analyses in order to map the relation between the identified features.

Addressing the lay conceptualization of envy

The present research broadens our knowledge about envy in several relevant ways. We address the lay conceptions of *envy* instead of relying on current research concepts of *envy*. Uncovering the everyday concept of *envy* indeed adds to research on envy by unveiling the internal structure of *envy*, *envidia*, and *Neid*, respectively, and by highlighting the importance of its underlying features (i.e., differentiating core vs. peripheral features), thus contributing to the definition and operationalization of envy.

In Study 1, *envy* and its translation equivalents of *envidia* and *Neid* were defined as referring to what you do not have but someone else has, thus confirming the importance given in previous research to social comparison processes (Boecker, Loschelder & Topolinski, 2022; Miceli & Castelfranchi, 2007; van de Ven & Zeelenberg, 2020). In line with the often quoted definition by Parrott and Smith (1993), participants described *envy* as being elicited by money, academic success, talent, character traits, and traveling, albeit to different degrees. One prominent approach that can accommodate these cross-cultural findings relates to considering the value orientations of vertical individualism and horizontal collectivism (e.g., Singelis, Triandis, Bhawuk & Gelfand, 1995). Indeed, research by Rodriguez Mosquera, Parrott, and Hurtado de Mendoza (2010) found that European Americans scored higher on vertical individualism and valued achievement more than the Spanish did. The Spanish, for their part, scored higher on horizontal collectivism and valued cooperation and connectedness more than the European Americans. This value-focused approach is even more advisable if we take into account that the present research combined different cultural value orientations. According to the Inglehart–Welzel World Cultural Map 2022, based on the World Values Survey and European Values Study 2017–2022, the United States is located in the English-speaking cluster and is characterized by higher self-expression values than Spain as well as more traditional values than both Germany (located in the "Protestant Europe" cluster) and Spain (located in the Catholic Europe cluster). Given that the United States, for example, scored higher on features related to

Table 3. *Comparisons of central and peripheral prototypical features of the internal structures of envy*, *envidia*, and *Neid* in three different countries (Study 2)

Feature	Network (I)	Comparison (J)	Mean difference (I-J)	Std. error	Cohen's *d*	Sig.	95% confidence interval	
							Lower bound	Upper bound
People with a nice home	USA	Spain	0.78	0.34	0.28	0.07	0.04	1.59
		Germany	0.90	0.36	0.35	0.04	0.03	1.75
	Spain	Germany	0.12	0.34	0.04	1.00	0.69	0.93
People with a state-of-the-art mobile phone	USA	Spain	0.57	0.36	0.19	0.35	1.44	0.30
		Germany	0.56	0.38	0.20	0.43	0.36	1.48
	Spain	Germany	1.13	0.36	0.36	0.01	0.26	1.99
People who have a big and close family	USA	Spain	1.00	0.35	0.34	0.01	0.15	1.8
		Germany	0.32	0.37	0.11	1.00	0.58	1.21
	Spain	Germany	0.68	0.35	0.23	0.16	1.53	0.16
Achieve with great ease, comes not as easily to you	USA	Spain	0.67	0.31	0.26	0.09	0.06	1.40
		Germany	0.49	0.32	0.20	0.40	0.29	1.26
	Spain	Germany	0.18	0.30	0.07	1.00	0.91	0.55
People with a special talent such as singing well	USA	Spain	0.76	0.34	0.27	0.08	0.05	1.58
		Germany	0.04	0.36	0.01	1.00	0.82	0.90
	Spain	Germany	0.72	0.34	0.25	0.10	1.53	0.09
People with more tasty food	USA	Spain	0.34	0.37	0.11	1.00	1.22	0.54
		Germany	0.86	0.39	0.29	0.08	1.79	0.07
	Spain	Germany	0.52	0.36	0.17	0.47	1.39	0.36

traditional values (e.g., home, family, and talent), respecting these dimensions might aid in providing valuable insights to address the differences of *envy* and its translation equivalents.

In Study 2, we mapped the internal structure of envy by determining the degree to which each feature is central to or typical of the everyday concepts of *envy*, *envidia*, and *Neid*. Whereas *envy*, *envidia*, and *Neid* shared a group of central features, they differed with respect to peripheral features. Applying network analysis to emotion concepts, we also studied the structure of interconnections in the respective networks uncovering the communities of features, the relations between the features, and the relevance of single features (i.e., nodes) within each of the networks. The network analyses revealed that these networks differed with respect to the sets of communities and underlying connections, as well as the relevance (i.e., centrality) of the features. Thus, the network analyses indicate interesting cross-cultural variations in the internal structure of *envy*, *envidia*, and *Neid*, including variations in network properties, which have been largely neglected in past research on envy. They, too, help us in understanding the underlying structure of the features of each of the emotion concepts (for community detection in phonological structures, see, for example, Siew, 2013).

Given research pointing to gender effects on the causes of envy in certain domains, we also tested whether gender effects may impact the ratings of the central and peripheral features extracted in Study 2 by subjecting them to one-way analyses. We found no gender differences with the exception of the four central features of people with a nice figure, $F(1, 402) = 6.60$, $p = 0.01$; people with lots of money, $F(1, 402) = 4.22$, $p = 0.04$; better grades than you with less effort, $F(1, 402) = 3.76$, $p = 0.05$; and achieving something with great ease that does not come as easily to you, $F(1, 402) = 5.73$, $p = 0.02$. With the exception of the feature of people with lots of money, where men scored higher than women ($M = 7.08$, $SD = 2.70$ vs. $M = 6.40$, $SD = 2.98$; 95% CI [0.03, 1.33]), $t(402) = 2.06$, $p = 0.04$, $d = 0.23$), men had lower scores on the features of people with a nice figure ($M = 6.09$, $SD = 2.75$ vs. $M = 6.91$, $SD = 2.84$; 95% CI [−1.45, −0.19]), $t(402) = 2.57$, $p = 0.01$, $d = 0.29$), better grades than you with less effort ($M = 6.31$, $SD = 2.70$ vs. $M = 6.90$, $SD = 2.68$; 95% CI [−1.19, 0.01]), $t(402) = 1.94$, $p = 0.05$, $d = 0.22$), and achieving something with great ease that does not come as easily to you ($M = 6.80$, $SD = 2.63$ vs. $M = 7.49$, $SD = 2.49$; 95% CI [−1.25, −0.12]), $t(402) = 2.39$, $p = 0.02$, $d = 0.27$). These results are consistent with research pointing to men envying the financial resources of peers and with women highlighting better looks (DelPriore, Hill & Buss, 2012; especially in the case of younger women, Henniger & Harris, 2015). Moreover, these findings also point to the importance of social comparisons for women with regard to having greater academic success and achievement without investing much effort.

Two types of envy: Malicious versus benign envy

There has been ample disagreement on the conceptualization of envy and whether or not envy is best represented as one construct or as two types of envy, namely benign envy versus malicious envy. In the present research, we asked whether some of the features of the everyday concepts of *envy* and its translation equivalents of *envidia* and *Neid* would relate to benign or malicious envy. Though we combined a language that differentiates between a benign and malicious form of envy (i.e., German; Lange & Crusius, 2015) and two languages that do not (i.e., Spanish and English), only Spanish participants mentioned "good" as a feature, along with "bad." The absence of features referring to malicious versus benign envy does not, however, evidence a lack of differentiation, as research has suggested that both benign and malicious envy can be conceived of in negative terms (e.g., Lange, Paulhus & Crusius, 2018; van de Ven, 2016;

van de Ven, Zeelenberg & Pieters, 2009). Future research might nevertheless include another language that has two words for *envy* and compare it on a cross-cultural level with different languages, both with and without two words for *envy* in order to disentangle the unique features of languages with two words for *envy* as compared with those languages with only one word. Interestingly, some of the features ("wish," "wanting something," "refers to what you also would like to have") may be interpreted as referring to a desire for an envy object and thus as benign envy from the dual envy theory perspective, with the feature of "anger" tapping malicious envy, whereas the comparison component and the feeling component, operationalized as anger, also nicely fit in the Pain Theory of Envy (Lange, Weidman & Crusius, 2018). Furthermore, the features referring to injustice ("better grades with less effort," "achieving something with less effort") might also be interpreted as malicious envy (Lange, Weidman & Crusius, 2018). No explicit mention, however, was found for the pain component of envy. Nevertheless, our data do not target the nature of envy; rather, they address the conceptualization of the *envy* concept in three countries. In this respect, the prototype approach followed in the present research allows for detecting whether the *envy* concept and its translation equivalents of *envidia* and *Neid* show differences in terms of their features and their clusters of conceptual features.

The translation of emotion words

The present research also takes up Cohen-Charash and Larson's (2017) suggestion to address whether or not "various words for envy represent culture-specific or universal emotions" (p. 175). The present studies, however, inform not only research on envy but also emotion research in general. Indeed, there has been ample debate about the nature of emotion categories (e.g., Barrett, Khan, Dy & Brooks, 2018) and whether or not the translation of emotion words allows for capturing the same features in different languages. We advance research on categories of emotion by suggesting that words commonly translated as *envy* in two other Western languages do share some constitutive features with the English *envy*, whereas we also observed differences in the way people from Spain and Germany conceive of *envidia* and *Neid*. Thus, standard translation–back translation tests, which often underlie cross-cultural comparison of emotion categories, might not properly assess the constitutive features of some categories of emotions. Here, discovery-based approaches are expected to shed more light on different everyday emotion concepts and thus help to disentangle whether or not emotion concepts can be defined in terms of necessary and sufficient characteristics or, to the contrary, might be characterized by fuzzy borders between categories. Researchers should be alert that the comparison of emotion concepts from different cultures within studies instead of across studies (e.g., van de Ven, Zeelenberg & Pieters, 2009) might address different features and characteristics of the emotional experience of envy.

How envy relates to other feelings

The present research also advances envy research by assessing how envy relates to other feelings. Consistent with previous research pointing to the relationship of envy and anger, the participants of all three countries reported feeling anger when experiencing envy. However, also consistent with earlier research on cultures of honor (Pedersen, Forster & McCullough, 2014), anger was mentioned more frequently and was also more prototypical in Spain. Interestingly, the feature of anger was not represented in the main community of either of the three networks; instead, it was represented together with the physical feature of "tensing up" in the Spanish network and a group of physical features in the US network, thus pointing to its relevance in terms of an activator of the experiential manifestation of envy.

Next to anger, one subgroup of the Spanish and US network, respectively, included sadness among their features. As the role of sadness has not been the focus of previous research on envy, our findings endorse the need of comparing envy with sadness, along with other everyday emotion concepts. Here, a prototype approach might also be helpful in differentiating between envy and resentment (van de Ven, Zeelenberg & Pieters, 2012), admiration (van de Ven, Zeelenberg & Pieters, 2011, 2012), or so-called problematic social emotions such as guilt and shame (Tangney & Salovey, 1999) by assessing the extent to which their features are unique or do overlap with those of envy.

Limitations

A few limitations deserve attention: One might want to argue that the observed differences are due to cultural differences in response styles, because there is a preference for either the highest or the lowest response option (for example, Hamamura, Heine & Paulhus, 2008). However, systematic research about the cognitive, cultural, or contextual factors underlying response styles is still needed (Benítez, He, Van de Vijver & Padilla, 2016) to determine whether differences in response styles do or do not affect cross-cultural comparisons substantially (e.g., Chen, Lee & Stevenson, 1995) or even do so in an inconsistent way (Diamantopoulos, Reynolds & Simintiras, 2006). One common observation seems to rely on the distinction of collectivist and individualistic countries, with participants from individualistic countries showing more extreme response behavior than participants in collectivist countries (e.g., Hamamura, Heine & Paulhus, 2008; Harzing, 2006). However, previous research has also found that Spanish participants showed more extreme ratings than Dutch participants, except when it comes to the response option of "never," for which Spanish participants were less extreme in their responses (Benítez, He, Van de Vijver & Padilla, 2016). Further, within Europe, Spanish and Italian participants showed more extreme responses than British, German, or French participants (van Herk, Poortinga & Verhallen, 2004). In the present research, care was taken in choosing Likert scales with 10 points, as suggested by Hui and Triandis (1989). We nevertheless adhered to the procedure of van Herk, Poortinga, and Verhallen (2004) and computed both negative and positive extreme responses by counting the responses given in terms of 0 (*not typical*) and 10 (*very typical*) and dividing the number by the number of items. Whereas significant differences were found between the three countries ($F(2, 401) = 4.32$, $p = 0.01$, $\eta^2 = 0.21$), post hoc Scheffé tests revealed that only the Spanish participants ($M = 0.27$, $SD = 0.20$)

were more likely to use extreme responses as compared to the German participants (M = 0.21, SD = 0.16); Spanish participants did not differ with respect to the US participants.

Another limitation refers to the use of university student samples, which may affect the potential generalizability and representativeness of the studies. Indeed, changes in domains eliciting envy may occur with increasing age (see discussion by Rentzsch & Gross, 2015). Across two studies, Henniger and Harris (2015) found changes across the life span in envy-eliciting domains, both with regard to the participants' own feelings (Study 1) and also to being the target of others' envy (Study 2): Envy in the domains of scholastic success, social success, looks, and romantic success decreased with age, whereas monetary success and occupational success were more often envied with age. Even though our research is in line with previous research using university student populations to analyze domains in which envy may occur and with research on emotion concepts, also relying mainly on student samples, more research is needed in order to address the impact of age on envy-eliciting domains depending on variables such as professional background or culture. On a related note, the limitations of our sample sizes for an accurate estimate of the networks have to be mentioned too. In fact, as participants judged 51 features, at least 1,275 participants in each country would have been necessary to estimate stable networks (Epskamp, Borsboom & Fried, 2018). Nevertheless, the relative position of the different features of the emotion concepts of *envy*, *envidia*, and *Neid* does provide us with valuable information about how they relate to each other within the respective everyday emotion concept.

Future directions

The present research adds to the literature on an emotion that has been suggested to be pan-human and present in every culture (Foster, Apthorpe, Bernard *et al.*, 1972) by mapping its internal structure in three different countries. Though network analyses have not yet been frequently used in research on emotion concepts, the present research points to the relevance of these analyses for revealing the internal structure of everyday emotion concepts, and thus for assessing the structure and relevance of the constitutive features of each emotion concept. Indeed, we suggest that network analyses are a suitable and relevant approach in emotion research allowing to analyze the overall structure of a specific emotion concept, the communities that constitute each network, the relationships of its nodes, and the relevance of each of these nodes within the network. Thus, network analyses bear the potential to enhance our understanding and knowledge about everyday emotion concepts. In this regard, future research might benefit from using network analyses combining them with other techniques, such as core/periphery analysis, to assess which features are located within the core of each concept as opposed to being part of the periphery, or assessing the degree centrality to analyze the number of nodes that are adjacent to a given node (Freeman, 1978) and thus the number of features to which one feature relates.

By applying network analyses to the everyday emotion concept of *envy*, we contribute to a better understanding of the features and their relationships within *envy* and its translation equivalents of *envidia* and *Neid*. Indeed, the present research suggests that despite the variability in their internal structure, *envy*, *envidia*, and *Neid* share a core of features and thus point to a common set of constitutive characteristics and elicitors. These findings might inform emotion research by pointing to characteristics and elicitors that can evoke envy in different countries and may therefore serve to substantiate future research on envy, such as designing studies that target the elicitation and reduction of envy. In this regard, work by Schweiger Gallo, Fernández-Dols, Gollwitzer, and Keil (2017) has laid the foundation for research on the internal structure of an emotion and its subsequent regulation by first analyzing the content universe of the emotion concept of *grima* (i.e., the aversive experience evoked when hearing, for example, a scratch on a board or plate) and thereafter addressing its regulation via implementation intentions.

As the present research allows for disentangling the features of *envy* and its translation equivalents of *envidia* and *Neid*, the generated knowledge may improve the induction of the emotion in future studies by focusing, for example, on stimuli related to successful people, people with a better appearance, or people with lots of money, all of which were identified as central features of the everyday emotion concept of *envy* and its translation equivalents of *envidia* and *Neid*. Moreover, research on the regulation of emotions might also profit from the obtained insights as they may help to target the down-regulation of features eliciting envy (e.g., traveling to a place to which one also wants to travel), but also the up-regulation of features of envy, such as when an adaptive consequence of envy is targeted (e.g., an improved performance leading to higher grades). Interestingly, emotion regulation strategies could differentially focus on central or peripheral features depending on the targeted intensity of the emotion.

More research, however, is also necessary to compare everyday conceptions of *envy* and other emotion concepts both on a cross-cultural level and within cultures. Thus, further research on envy might focus on different populations, as well as on non-Western cultures rather than only on Western cultures, as our studies did. Moreover, the comparison of other emotion concepts and their translation equivalents in other countries might further advance our knowledge of the conceptual and experiential differences of emotion concepts and even shed light on the question of whether or not direct translations (and back-translations) adequately assess emotion concepts and their assumed conceptual equivalence.

CONFLICT OF INTEREST

The present studies were financed by a DAAD fellowship (Ref. 91645220) and partially funded by a scholarship from the Ministerio de Educación, Cultura y Deporte (Estancias de movilidad de profesores e investigadores en centros extranjeros de enseñanza superior e investigación; CAS15/00030) granted to Inge Schweiger Gallo.

ETHICS STATEMENT

The two studies are based on questionnaires. Approval was obtained in line with the customs of the participating institutions.

In the case of the US samples, the study was approved by the internal review board of New York University, USA.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ENDNOTES

[1] Whenever we refer to a conceptual category or its features, we use italic characters, whereas when we refer to an emotion in general, unspecific terms we do not use special characters.

[2] To avoid confusion with respect to the use of *Neid* in the present research, "Beneiden" is the German verb relative to "Neid" (be- + Neid ("envy") + −en).

[3] Our sample sizes equaled or even somewhat exceeded those from previous research based on prototype approaches, such as studies compiling features and assessing centrality ratings of gratitude (Lambert, Graham & Fincham, 2009), listing of characteristics and estimation of prototypicality of modesty (Gregg, Hart, Sedikides & Kumashiro, 2008), or listing of features and quantifying of feature centrality of vengeance (Elshout, Nelissen & van Beest, 2015).

[4] Once the linguistic units had been extracted and the features were grouped into categories, we calculated the percentage of mentions of the features taking into account the total number of participants even though each participant might have contributed more than a single feature to each of the questions.

[5] All analyses were run with Pajek.

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Received 13 March 2023, Revised 27 November 2023, accepted 29 November 2023