Agency, mood and grammar.

The role of verbs in managing sadness and its consequent inaction

Caterina Suitner*, Magdalena Formanowicz^†, Janin Roessel°, Anne Maass*

*University of Padova

^University of Humanities and Social Sciences, Warsaw

†Nicolaus Copernicus University, Torun

°University of Mannheim

Correspondence concerning this article should be addressed to Caterina Suitner, DPSS, University of Padova, via Venezia 8, 35137 Padova, Italy

Tel +39 0498276362

E-mail: caterina.suitner@unipd.it

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Abstract

Action propensity is linked to both mood and grammar: Compared to happiness, sad mood is typically envisaged as impeding agency. On the grammatical side, verbs prompt agency whereas nouns appear associated with lower agency. In two studies, we explored these relations showing that sad mood induced by music (Study 1, N = 98) increased the number of nouns (vs. verbs) in a word generation task. Conversely, when verbs versus nouns were experimentally primed and willingness to engage in actions measured (Study 2, N = 163), the propensity to engage in actions increased among people in a more negative mood. Together, the two patterns of results suggest that verbs may be strategically used to counteract inertia linked to negative mood.

Sad mood inhibits action, verbs prompt it, whereas nouns reflect stability. We explored these relations showing that sad mood induced by music (Study 1, N = 98) increased the use of nouns compared to verbs. Action propensity increased among sad people after a verb (vs. noun) prime (Study 2, N = 163). Verbs may be used to counteract inaction in negative mood.

Keywords: language, meta-semantic effects, verbs, agency, mood

Agency, Mood and Grammar.

The Role of Verbs in Managing Sadness and its Consequent Inaction

When feeling down, we tend to freeze our activities, stay in bed, rest on the couch, or at least wish we could just do any of these. If prolonged, such diminished interest in undertaking activities, a visible slowdown and loss of energy can indicate mild or clinical depression (American Psychiatric Association, 2013). In this research, we investigate whether depressed mood and its subsequent inaction is reflected in linguistic manifestations (avoidance of verbs) and whether vice versa, the use of verbs can help those in a negative mood to overcome inactivity. In this way, this study adds to the long tradition of research indicating that depression or depressed mood are often reflected in language (e.g., Al-Mosaiwi & Johnstone, 2018; Bernard et al., 2015; Smirnova et al., 2018; Zimmermann et al., 2013).

Verbs as Carriers of Activity

So far socio-cognitive scholars have investigated the effects of word classes ranging from verbs to nouns mainly within the framework of the Linguistic Category Model (Semin & Fiedler, 1988), in which the semantic value of verbs and nouns (the focus of the present work) is strongly intertwined with their grammatical characterization. According to this model and its extensions (Carnaghi et al., 2008), nouns are generally more abstract than verbs, but even within the verb category there are different levels of abstraction, whose distinction, however, relies heavily on semantics (e.g., “to hate” is more abstract that “to insult”). Moving a step forward, the Social Grammar Model (Formanowicz et al., 2017) focuses purely on the grammatical class and disentangles the role of nouns and verbs from the meaning of the words. The model specifically attributes to the grammatical category of verbs the role of conveying a sense of agency, and these

meta-semantic effects were confirmed in experimental work with pseudo-words and large corpora analyses alike.

For example, slogans expressed in verb form communicated that an organization is more agentic and, for that reason, also more effective (Formanowicz et al., submitted). Along the same line, girls were more likely to engage in scientific research when encouraged to do so with a verb ("Let's do science") than with a noun ("Let's be scientists!"; Rhodes et al., 2019). On a more basic level, Foroni and Semin (2009, Study 1) compared the activation of facial muscles while reading positive or negative verbs (to smile, to cry) or adjectives (funny, annoying). Participants' muscular activity was congruent with the valence of words, as stronger zygomatic activation was observed for positive words, and stronger corrugator activation for negative words. Importantly, this difference was more evident for verbs than for nouns, suggesting that verbs had a greater motor resonance. In Study 2, the authors further provide evidence for the contingency of verb effects on motor activity. The valence of subliminally presented verbs (but not of adjectives) influenced funniness ratings. But this effect of verbs was absent when the motor resonance was inhibited by holding a pen between the lips. Together, there is strong evidence that verbs are linked to action, and may encourage it, above and beyond their specific semantic meaning.

Nouns as Carriers of Stability

The grammatical category that is often contrasted to verbs is nouns (for example, Colombo et al., 2017; Sahin et al., 2006; Shapiro et al., 2006; Caramazza, & Hillis, 1991; Preissl, Pulvermüller et al., 1995). Nouns are known to reveal categorical stability, as they convey information that is more likely to be essentialized, decontextualized and stereotyped. Walton and Banaji's seminal work (2004) showed that when preferences were described with nouns (e.g., "I am a chocolate eater"), they were evaluated as more stable and stronger than when the same

preference was expressed with a verb (e.g., "I eat chocolate a lot"). Carnaghi and colleagues (2008) further applied this essentialist property of nouns to socio-cognitive processes. The authors showed that when social memberships are expressed with a noun (vs. adjective), they become more essential, and promote inferences congruent with the social stereotype, while inhibiting alternative social memberships. In sum, verbs are cognitively associated with action and change, nouns with stability and essentialism.

Verbs and Nouns in Emotion Regulation

While the literature has focused on the use of such grammatical devices in the context of social communication (e.g., Bryan et al., 2013; Bryan et al., 2011), of language development (e.g., Gelman, 2004), and investigated their neural correlates (for an overview see Vigliocco et al., 2011), little is known about their role in emotion regulation. However, since Freudian conceptualization, melancholia was described as associated to inaction (Freud, 1924). Whereas happiness is associated with stimulation seeking, depression is characterized by inhibition of action (Meyer et al., 2001) and negative mood/sadness with low levels of agency or action propensity (Frijda, 1986; Albarracin & Hart, 2011; Rucker & Petty, 2004). It can be hypothesized, therefore, that verbs -through their link with agency- are negatively related to sad mood, whereas nouns through their associations to stability and lower agency (see also Formanowicz et al., 2017) are positively linked to sad mood. Although this hypothesis has, to our knowledge, not been investigated directly so far, grammatical categories of verbs and nouns have been studied in reference to approach emotions such as anger (Idan et al., 2018), which may be considered an "activating emotion". Information conveyed with the use of verbs was related to higher levels of anger than information conveyed with nouns. These results match the role that semantically agentic words (considered generally without grammatical distinction) play in well-

being (Robinson et al., 2016). For instance, in speech samples of prominent physicists, historians, psychologists, and American presidents, the use of agency-related words such as "achieve," "fix," and "control" predicted longer life-spans and was linked to effective self-management. Extending this prior work, here we investigate whether verbs and nouns are related to negative and positive mood, specifically regarding sad and happy emotions.

The Present Research

On the one side, the literature on emotion suggests that sadness typically prevents people from being pro-active and facilitates the view that things are stable, and unlikely to change. On the other side, linguistic socio-cognition researchers advocate that verbs are the vehicle of action, nouns the container of essentialism. The main goal of this work is to merge these two literatures, exploring the relation between mood, grammar and agency.

In Study 1, we prompted negative mood through sad music and we investigated participants' word generation, hypothesizing that sad (vs. happy) music will reduce the accessibility of verbs because of the in-/action associated to negative mood and verbs, respectively. Furthermore, we also tested the association between reported mood and verb accessibility. In Study 2, we experimentally manipulated the accessibility of verbs (vs. nouns) and measured action propensity.

The two general hypotheses underlying this research are:

a) Sad mood is associated with less agency (i.e., less activity and more stability) and via this route to less verbs and more nouns usage;

b) Verb vs. noun usage could in turn influence agency/action proclivity for people in a negative mood.

Given the specific association between agency and verbs, verbs may be envisaged as a grammatical tool that prompts action proclivity among sad people and therefore help them managing the behavioral inertia associated to their state.

Study 1: Effects of Mood on Grammar

In Study 1, we prompted negative mood through sad music and investigated participants' self-descriptions, hypothesizing that sad (vs. happy) music will reduce the use of verbs and enhance nouns in self-descriptions over the time course of the mood induction. In addition, we assessed people's depression scores as a control variable and to test for possible moderation of effects.

Method

Participants

All participants were recruited through a snowball procedure sending a link to the online survey via mail or social media during the time frame of a course in Persuasion and Social Influence. The survey was hosted on the platform Qualtrics. We tried to collect as many participants as possible within the timeframe. In total, 180 persons accessed the first page of the survey, and 123 actually completed it. Six could not hear the music and were excluded, 18 did do not complete task 1. One participant responded to the manipulation tasks "I don't know" and was also excluded from the analysis. The final sample consisted of 98 Italian participants (66 female and 30 male, M_{age} = 25.96, SD_{age} = 8.22). The survey language was Italian. The study approved by the Ethic Committee of the University of Padova (protocol number 3474).

Procedure and Materials

The experiment was introduced as a study investigating the relationship between language, cognition and music. Participants were explicitly instructed to use headphones to listen

to music during their participation. Participants were randomly assigned to one of the two experimental conditions, in which mood was elicited with music (Västfjäll, 2001). In the negative condition, participants were exposed to Barber's Adagio for Strings, which was previously successfully implemented for a sadness manipulation (Halberstadt et al., 1995). In the positive condition, they listened to Mozart's Sonata 16 Allegro KV 545. The music was playing during two consecutive word-generation tasks, lasting 30 seconds each. During the two tasks, participants were asked to list all the verbs and nouns (order of mentioning was counterbalanced across participants) describing themselves. In the second word-generation task, they were asked to generate new words compared to the previous task. This procedure allowed for investigating how the effects unfold over time. We predicted decrease in verbs and an increase in nouns from task 1 to task 2 in the sad (but not in the happy) condition.

Immediately after completing the second word generation task, participants completed the Self-Assessment Manikin items for affective valence and arousal on two 9-point scales (Bradley & Lang, 1994) to verify the effectiveness of the mood induction. To control for participants' depression level, six items from the PHQ-9 scale were assessed (Spitzer et al., 1999).

In order to exclude any participant that may have failed to listen to the music, we included a question on the music genre whose last response option was "I could not hear any music" (this item screened out six participants). Moreover, one item assessed the emotion (sad or happy) that the music aroused in them. Finally, demographic information was collected.

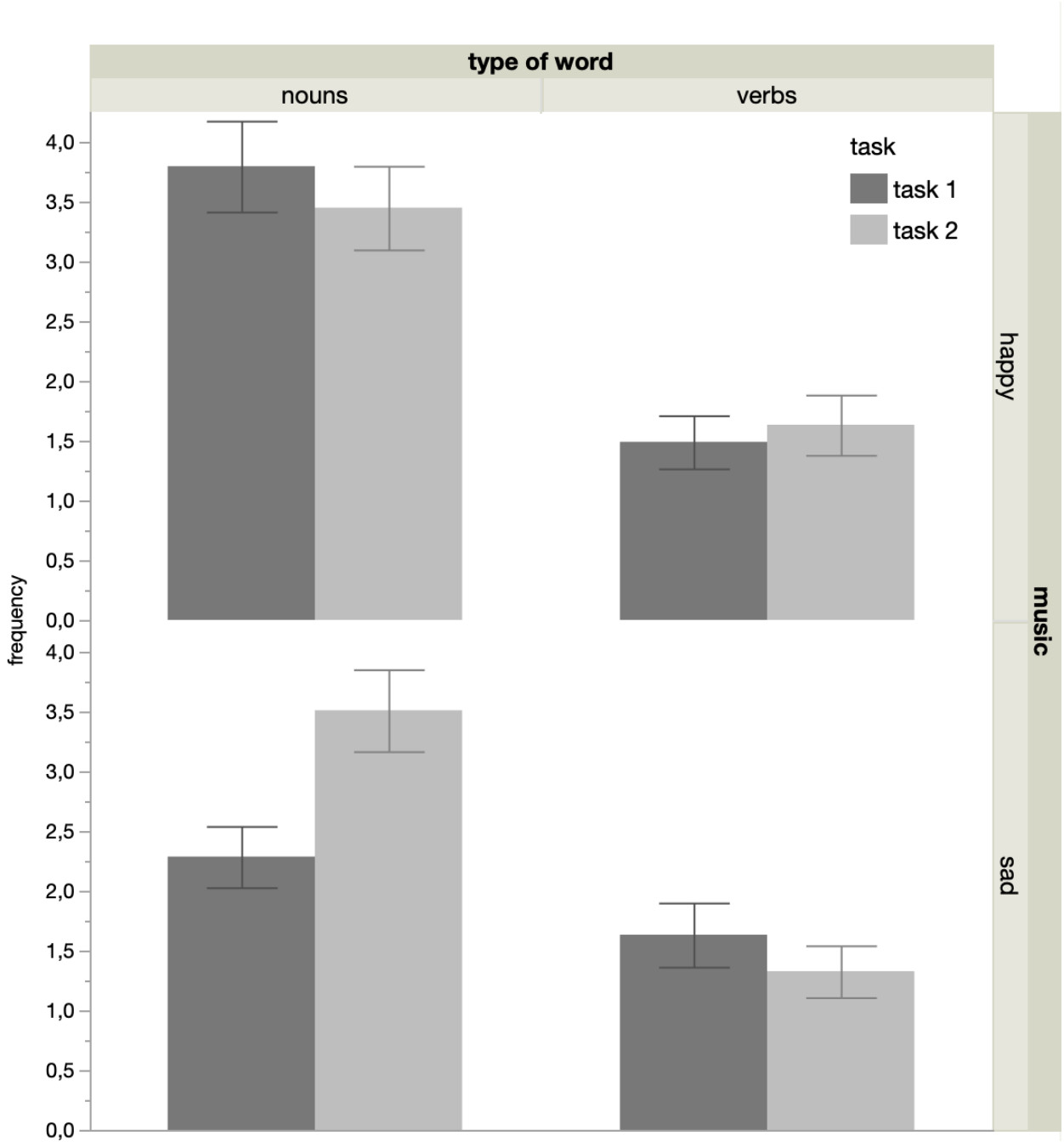
Results

Analyses were conducted by means of the softwares JMP® and R. We first investigated the effectiveness of the mood induction. The responses to the Self-Assessment Manikin showed

that participants who listened to happy music were on average happier (M = 7.12, SD = 1.74) and more aroused (M = 4.67, SD = 2.004) than participants who listened to sad music (for valence: M = 6.16, SD = 1.75, t(95.99) = -2.70, p = .004, CI [-.25; -1.66]; for arousal M = 3.67, SD = 2.32, t(93.99) = -2.28, p = .012, CI [-.13, -1.87]). It appears that participants in the sad mood induction still reported relatively positive mood on valence. However, 65.31% of the participants assigned to the sad condition and 93.88% of the participants assigned to the happy condition reported that the music elicited in them sadness and happiness, respectively.

To investigate whether the production of verbs and nouns was differently associated with the type of music participants were exposed to, we run a linear model with as interacting factors music (sad vs. happy), type of word (verbs vs. nouns), and task (task 1 vs. 2). Type of word (verbs vs. nouns), and task (task 1 vs. 2) varied within subject factors. Depression level was included as a co-variating factor (if we remove this factor from the model, the result pattern remains the same). A main effect of type of words showed that in general participants produced more nouns (M = 3.26, SD = 2.40) than verbs (M = 1.52, SD = 1.68), F(1, 95) = 63.70, p<.001, partial Cohen's f= .81, 90% CI [0.09, 0.43]. The three-way interaction confirmed that the number of produced words at task 1 and 2 depended on the type of music and type of word, F (1, 95) = 6.45, p = .013, partial Cohen's f= .26, 90% CI [0.09, 0.43], with an increased number of nouns observed in task 2 (see Figure 1 and Table 1). A closer inspection of the three-way interaction with post-hoc pairwise comparisons (with Tukey-Kramer correction), shows that the effect is mainly driven by an increased number of nouns in task 2 compared in the sad music condition, t=3.80, p=.006, CI [-2.22, -0.23], Cohen's d= 1.83. The other contrasts fail to reach the statistical threshold (for descriptive see Table 1)

Figure 1



Average frequency of Type of Word Use in Task 1 and 2 as a Function of Type of Music. Bars represent standard errors.

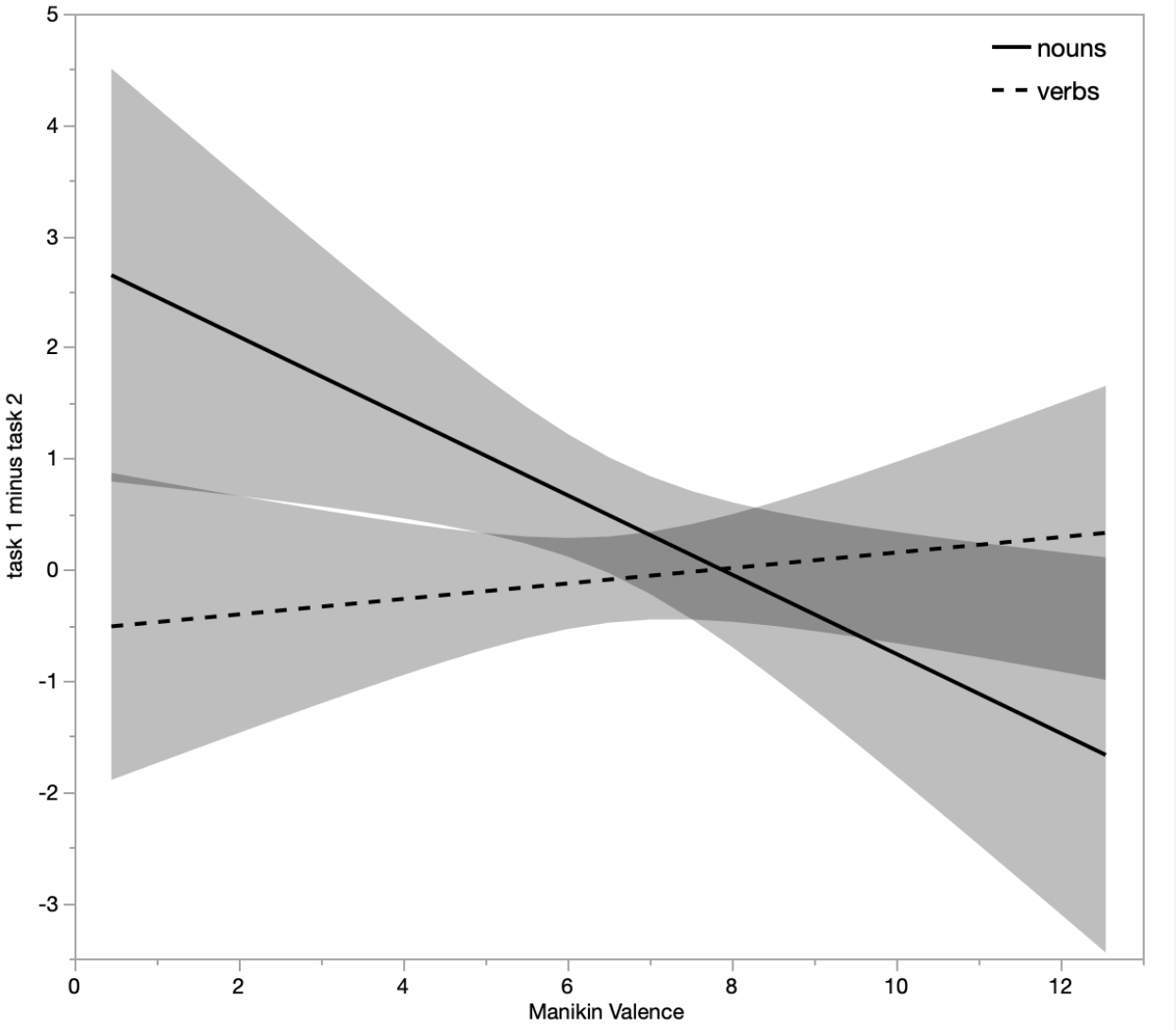
Table 1

type of word	music		task 1	task 2
nouns	happy	*M*	3.8	3.45
		SD	2.66	2.45
	sad	*M*	2.29	3.51
		SD	1.79	2.4
verbs	happy	*M*	1.49	1.63
		SD	1.56	1.76
	sad	*M*	1.63	1.33
		SD	1.88	1.52

Mean and standard deviations of frequency of Type of Word Use in Task 1 and 2 as a Function of Type of Music

In order to further investigate how the change in usage of verbs and nouns (as an indicator of accessibility) was linked to the elicited mood/emotion, we run a linear model with interacting factors type of word (verbs vs. nouns), and task (task 1 vs. 2) and mood assessed with Manikins. Type of word (verbs vs. nouns), and task (task 1 vs. 2) varied within subject factors. As before, depression was included in the model as a covariate. The interaction between elicited mood, type of word and type of word, $F(1,95) = 3.63$, $p = .059$, partial Cohen's f= .19, 90% CI [0.00, 0.36], showed that with negative mood the number of produced nouns (vs. verbs) was increased, see Figure 2 where difference scores of number of verbs and nouns at tassk2 minus task 1 are plotted as a function of Positive Mood. It is also worthwhile reporting the negative correlation between the difference scores of nouns and verbs, $r = -.55$, $p < .0001$

Figure 2



Increased Accessibility of Verbs and Nouns as a Function of Positive Mood

Discussion

Study 1 suggests that mood can make specific grammatical classes more accessible. In particular, sad music made nouns more likely to be used in self-descriptions. Unexpectedly, we did not find the hypothesized decrease of verbs given sad music; there was only a nonsignificant tendency, possibly related to the mood induction, which apparently did not suffice to put people

in a sad state, as evidenced by their average valence ratings; and therefore, likely did not reach the degree of associated inaction, which we hypothesize to be crucial for this effect.

Albeit this correlational data cannot be interpreted in a causal way, it may offer first evidence to the idea that verbs and nouns differ in their emotional effects. The fact that the increased use of the two grammatical classes correlate negatively suggests they may indeed somehow offer opposite strategies. Verbs (vs. nouns) might represent a linguistic device for counteracting (vs. increasing) the inactivity associated with sadness. Study 2 was to test this experimentally.

Study 2: Effects of Verb and Noun Accessibility on Action Proclivity

In Study 1, participants with more negative mood and in the sad music condition increased their use of nouns, which were in turn negatively correlated with used verbs.

One may therefore argue that verbs could be strategically used to counteract the inaction associated with negative mood and possibly emphasized by nouns. If this was the case, inducing people to use more verbs may indirectly encourage them to take action. In Study 2, we experimentally made the grammatical category of verbs (vs. nouns) salient in order to investigate whether verb accessibility would prompt participants' action propensity. This effect should be particularly evident for participants in a sad mood, therefore particularly prone to inaction. This is in line with previous results employing the verb vs. noun manipulation. Indeed, weak or no effects are often reported when the manipulation is provided in a plain text and in a regular context (e.g., Gerber et al., 2016; Bryan et al., 2011). However, in contexts in which participants are encountering a set-back or when the task at hand is going against their group stereotype and expectations, there is a tendency to continue the task for longer or engage more when primed by a verb (Foster-Hanson et al., 2020). We specifically hypothesized that participants in a negative

mood would be less likely willing to engage in activities characterized by high levels of agency, because sad mood is typically associated with inaction. In addition, given that verbs are specifically associated with agency, we further expected that, compared to nouns, verb accessibility reduces inaction and pushes participants in a sad mood toward action orientation.

Method

Participants

The study was hosted on the platform Qualtrics. All participants were recruited through a snowball procedure sending a link to the online survey via mail or social media during the time frame of a course in Persuasion and Social Influence. We tried to collect as many participants as possible within the timeframe. In all, 263 Italian persons accessed the survey, 166 actually completed it. Three failed to follow the instructions of the manipulation and self-described using verbs while they were assigned to the noun condition (or vice-versa), therefore they were excluded from the analysis. The final sample consisted of 163 participants (111 female, three non-binary, and 49 male, M_{age} = 26.28, SD_{age} = 9.55). Given that in Study 1 the achieved effect size was f=.26, this sample size should suffice to achieve a power of .90 in a Manova with 2 groups and 2 measures, with alpha set at .05 according to G*Power program (Faul, et al., 2007). The survey language was Italian. The study approved by the Ethic Committee of the University of Padova (protocol number 3474).

Procedure and Materials

The experiment was introduced as a study investigating the relationship between language, emotion and action propensity. Participants were randomly assigned to one of two experimental conditions, in which participants were asked to list in a text box either 10 verbs (e.g., “to dance”) or 10 nouns (e.g., “dancer”) that characterized their person. Then, they were

asked to indicate on a slider ranging from *I would not at all do it* (0) to *I would surely do it* (100) to which extent they would engage in eight activities if they had free time. The eight activities were selected through a pre-test ($N = 30$) to be high in agency (visiting a new city, cooking new recipes, making an excursion in the mountains, trying a new sport) or low in agency (resting under the beach umbrella, having a long warm bath, cuddling the cat/dog, watching a movie on the sofa). Negative mood was assessed after the activities rating on a 5-point scale using four items ("I have a very bad mood in this moment", "I feel calm and relaxed"(R), "I feel sad", "I feel good"(R)) adapted from Wojciszke and Baryła (2005). The second item did not correlate with the rest of the scale, we therefore computed a negative mood index with only three items (Cronbach's $\alpha = .74$). Finally, demographic information was collected.

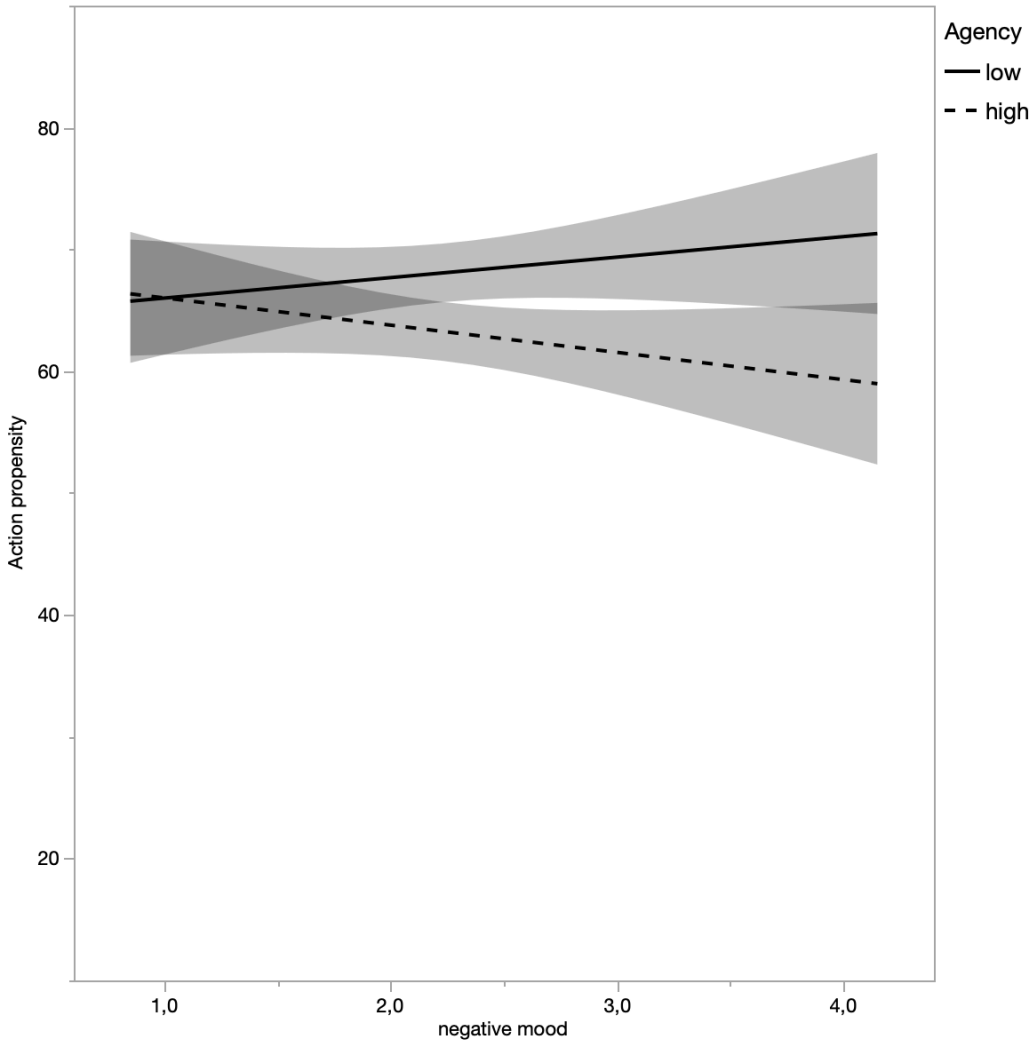
Results

Analyses were conducted by means of the softwares JMP® and R. A linear model was conducted using as dependent variable action propensity, as predicting factors experimental condition (noun vs. verb), agency of the activity (high vs. low), and assessed negative mood (which did not vary according to experimental condition). Agency varied within participants. Participant and the specific activity were included in the model as random factors and agency was nested in participant. Agency had a main effect, $F(1, 159) = 6.08$, $p = .013$, partial Cohen's $f = .20$, 95% CI [0.07, 0.33], with participants being more willing to engage in activities characterized by low ($M = 68.08$, $SD = 31.23$) than high ($M = 63.25$, $SD = 31.39$) agency. Regarding basic mood-dependent activity preferences, the hypothesized interaction between negative mood and agency of activities failed to reach the standard threshold, $F(1, 159) = 2.37$, $p = .12$, partial Cohen's $f = .12$, 90% CI [0.00, 0.25], yet at the descriptive level the pattern of the data is in line with the expectations (see Figure 3). Participants in very bad mood were missing,

as responses ranged between 1 and 4, *M*= 2.23, *SD*= .75, Median= 2. If we median split mood in two levels, we can see that participants in relatively negative mood preferred activities characterized by low (*M* = 69.44, *SD* = 18.15) rather than high agency (*M* = 62.29, *SD* =16,84), *t*(113) = -3.11, *p* = .002, 95% CI [-11.7, -2.59], and that participants in relatively positive mood did not differentiate activities on the basis of agency (low agency: *M* = 64.90; *SD* = 20.55; high agency *M* = 65.48; *SD* = 16.70), *t* < 1.

Figure 3

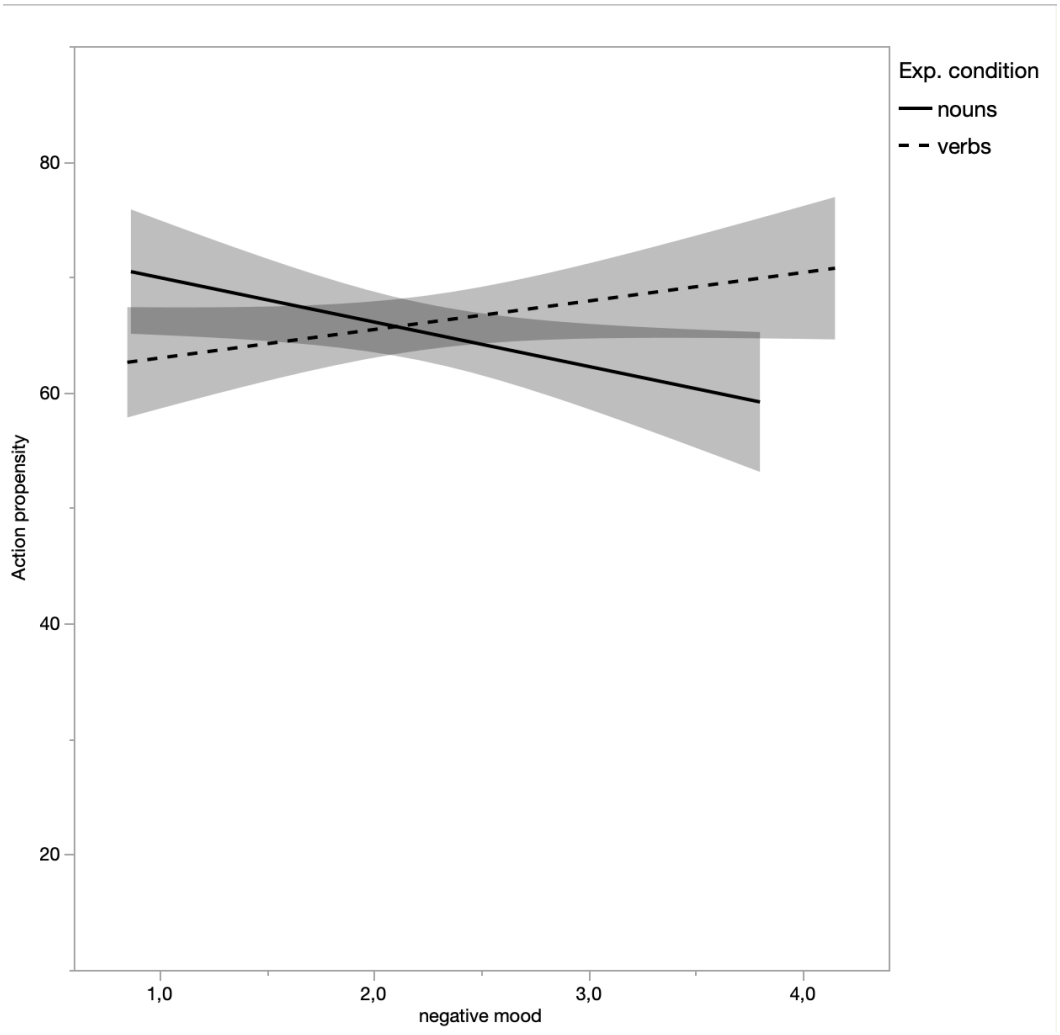
Action Propensity as a Function of Negative Mood and of Agency of the Proposed Activity



The interaction between experimental condition and negative mood on action propensity, $F(1, 159) = 5.21$, $p = .024$, partial Cohen's f= .18, 90% CI [0.05, 0.31], indicates that the worse participants mood, the more verbs were effective in increasing action propensity. For nouns the opposite effect was observed, the worse participants mood, the more describing oneself in terms of nouns deteriorated action tendencies (see Figure 4). The lack of interaction among experimental condition, negative mood and agency ($F < 1$) indicates that the intersectional effect of grammatical class and mood on action propensity was not moderated by the type of activity.

Figure 4

Action Propensity in Function of Negative Mood and Experimental Condition



Discussion

We experimentally manipulated the accessibility of grammatical classes, and confirmed that this manipulation had an effect on action propensity. Specifically, when participants were in a sad mood, the accessibility of verbs (contrary to nouns) was associated to more willingness to engage in activities. This action predisposition was generalized to actions characterized by both low and high agency, suggesting that verbs prompted a general action proclivity. This result

suggests that verbs can serve as a subtle tool for managing the inertia that is typically associated with negative mood.

General Discussion

Extending the previous literature documenting linguistic manifestations of depression (e.g., Al-Mosaiwi & Johnstone, 2018; Bernard et al., 2015; Zimmermann et al., 2013; Zimmermann, Brockmeyer et al., 2017), in this article we report two studies pointing at the potential role of verb accessibility in negative mood and its related inaction tendency. As in previous studies (Smirnova et al., 2018), the role of verbs seems to be particularly critical for people with negative mood. Furthermore, we document the potential of verbs as grammatical markers of agency to create subtle interventions increasing activity levels for people with depressive mood.

The obtained findings highlight the potential of integrating linguistic strategies in clinical practice. Specifically, collecting linguistic samples may be used in early diagnostic screening or in mass screening (for example analyzing big data collected in online written exchanges). Similarly, the potential of verbs in boosting activity, for example through prompts asking to list the planned daily activities in verb form, should be further examined as a way to keep people active and reduce inertia tendencies associated to negative mood.

However, also limitations of the current studies need to be acknowledged. Prompting verbs in people with sad mood may also have detrimental effects. Albarracin and Hart (2011, Exp. 4) found that participants induced with sad (vs. happy) mood were more likely to perform well in an intellectual task when primed with nonaction (e.g., “pause,” “interrupt,” “calm,” and “paralyze”) than action words (e.g., “motivation,” “engage,” “active”). The contrast between action induction and mood may therefore have cognitive costs, whose consequences have to be taken into account. Along these lines it is important to note that mood in our samples only varied

by degrees and participants did not evidence intense sadness or negative mood. Therefore, future research with clinical samples or non-clinical samples experiencing more intense mood states is a viable avenue for future research. Furthermore, our studies have been conducted in Italian. In the domain of cross-linguistic comparisons, Wierzbicka (2009) has suggested a culture-specific association between verbs and action, suggesting that English speakers are more likely to envisage emotions as states because in their language emotions are mainly expressed through adjectives, whereas in Russian emotions are generally coded through verbs, and consistently conceived as activities. Indeed, a decreased use of verbs in present tense in linguistic samples of patients with mild depression in comparison to people with mere sadness was observed for Russian language. Although positive effects of verbs on priming (perceived) action tendencies were also recorded in English (Formanowicz et al., submitted; Rhodes et al., 2019), the direct replication of the current results in other languages awaits future research.

Verbs and nouns are the lexicon building blocks, they are considered universal grammatical categories (Hopper & Thomson, 1985; Langacker, 1987; Robins, 1952), and indeed they constitute the major part of both children and parents' vocabulary (Hanhong & Fang Alex, 2011). We can rely on a verb ("you lie!"*)* or a noun ("you are a liar!"*)* to transmit the same core meaning of our message, whether we choose one or the other is a matter of personality (Cope, 1969), of culture (Maass et al., 2006), and of communication strategy (Maass et al., 1989; Wigboldus et al., 2005) with important pragmatic consequences (Wigboldus et al., 2000). Our studies provide further evidence for the role language plays in an important realm that has received relatively little attention: mental wellbeing.

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