

Littering Attitude among University Students in Cameroon

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ABSTRACT

The objective of this study is to explore the relationship between sociodemographic determinants and littering attitude among the students of the University of Yaounde 1 (UY1). For this purpose, we administered the Littering Attitude Scale (LAS) of Ojedokun (2015), built in Nigeria. The last is a 5 points-Likert Scale comprising 24 items, with a good reliability (α of Cronbach = .87). The pilot-test with 20 respondents showed a less strong, but still good reliability in Cameroon context (α of Cronbach = .747). Participants were 493 students (males and females aging 15 to 46) from the internal structure of the UY1. Results indicated a high negative attitude toward littering by comparing respondents' scores to the hypothetical mean of 2.5 (Mean = 3.826; SD = .453; $p < .001$), which means that our participants have a negative emotion toward littering. Only age appears to have a significant positive relationship, though weak, with the littering attitude among the UY1 students ($r = .122$; $p = .042$). All the other sociodemographic variables like sex, education level, faculty, education background, type of residence, place of residence, region of origin, financial situation, marital status, employment status, and religious affiliation, came out to be unrelated to the littering attitude. Since the campus is always littered, it will be pertinent to measure, in further studies, the littering behavior rather than only attitude towards littering.

Keywords: *Littering attitude, Sociodemographic determinants, Students, University of Yaounde, Cameroon*

Manifold uncontrollable daily activities of men, consciously or unconsciously have been degrading the environment in all its forms. Such degradation has been having a lot of repercussions on mankind in terms of climate change, global warming, economy downfall, and the proliferation of many diseases. It is such a huge cause for concern that led us to explore the area of pollution and most precisely the rampant littering issue among the students of the University of Yaoundé 1 (UY1).

Nowadays, no society worldwide is spared from the rampant issue of pollution, which is causing innumerable havocs to mankind. Litter represents one of the major contributors to environmental pollution and degradation; it is rooted in human behavior (Shukor et al., 2012). Littering, the improper disposal of small quantities of waste is one of the main causes of environmental degradation (Freije, 2019). It is in this regard that Steg & Vlek (2009)

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posited that environmental problems largely stem from human behavior. In fact, littering concerns everybody, because everyone litters one way or the other. That is why Liu & Sibley (2003) differentiated between passive and active littering. The recrudescence of litter in our societies has been raising lots of concerns, as they are becoming a huge ruin to the economy, and Health (biologically and psychologically). Littering is the inappropriate disposal of any type of waste. For Ojedokun (2011; 2015), it includes cigarette butts, paper, plastics, metals, glass, beverage containers, pets, cans, bottle caps, fast food packaging, drink bottles, sugar cane and maize husks, citrus and yam peels, groundnut shells, wrappers thrown from the windows; and the abandoned furniture and automobiles. Pollution is thus a plague which is affecting, ruining the whole world at a continental, national and local scale.

Since the year 2000, the campus of the University of Yaoundé 1 (UY1) has been strewn with litter of all types on the lawns, stadia, alleys, Amphitheaters, and other little class halls. Empty bottles (e.g., of water and juice), fruits peels (e.g., banana, oranges, pineapple, mango) groundnuts shelves, corn husks, empty packages of biscuits, sweets, chewing gums, and food remnants (e.g., bread, cake, meat, and fish bones), are common litter observed.

Biologically, a littered environment is associated with health risks such as diabetes, heart attack, and strokes, and even crime (KINDOM services Group, n.d). Litter is also at the origin of the deadly malaria and typhoid, which are fashionable diseases in Cameroon. Over 90% of Cameroonians are at risk of malaria infection, and 41% have at least one episode of malaria each year (Mbenda et al., 2014). Three thousand death cases of malaria were recorded in 2018, as cited in APA News (2018), and the number of cases keeps on increasing till today. This is undeniably the reason behind some death cases, and prolonged absenteeism that used to be noticed at the UY1. Psychologically, since the year 2000 equally, the commitment and academic performances of students have been dropping gradually. This can justify studies testifying that littered places cause eyes fatigue, anxiety, depression, reduces concentration (Berto, 2005; Berman et al., 2008; KINDOM services Group, n.d; Elk, 2019). Moreover, litter is arguably one of the most aesthetically displeasing occurrences that plagues our communities and natural environment (Stone Van, 2019).

Conscious of such a situation endangering student's life, the UY1 authorities installed litter bins almost everywhere on the campus, hygiene teams were hired, for daily cleaning. Electronic communicate boards, with messages such as "the cleanliness of the campus is the responsibility of we all" have been installed at some strategic corners of the campus, alerting students for environmental protection. Besides, the student union made a room for volunteer students to be performing some cleaning on campus each Saturday morning, which is really enforced. Some cleaning hours have been attributed to all the on-campus sellers called "Thursday cleaning", where all shops are closed from morning till 11 am for the campus cleaning.

Despite such remarkable endeavors, still, a day cannot fade away, without the observation of litter of all types in all the nooks and crannies of the campus. This phenomenon seems to be a social contagion, referring to the spread of littering from one person to another. Remedies provided by the UY1 authorities, seem to be inefficient in providing a lasting solution as litter keep on spreading. Such a situation actually raises a serious problem of littering among the students of the UY1, which requires quick consideration and intervention. In fact, individuals with more education in general, are more concerned about environmental-related issues (Chanda, 1999). They are more likely to engage in pro-environmental behaviors because they are exposed to more information about harm through

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schooling (Curnow et al., 1997). Humans evolved as creatures deeply enmeshed with the intricacies of nature and that we still have this affinity with nature ingrained in our genotype (Neill, 2008). Unfortunately, it is the whole reverse with the highly educated ones of the UY1; that which a cause for concern becomes.

Kaiser et al. (1999) establish environmental attitude as a powerful predictor of ecological behavior. Newhouse (1990) attributed the answer to societal issues as residing in environmental attitudes. Formally, the attitudinal concept was defined as follows: A strong motor expression of a particular emotion (Darwin, 1872). The mindset of an individual towards a value (Thomas & Znanieckie, 1918). This construct is also viewed as, readiness of the psyche to act in a certain way (Jung, 1921). Nowadays, the concept is popularly cited as defined by Eagly & Chaiken (2007) in this way: a Psychological tendency expressed by evaluating a particular entity with some degree of favor or disfavor.

Since littering is a societal and attitudinal problem, littering attitude will be investigated among the students of the UY1, along with their sociodemographic determinants. Researchers have been using several Sociodemographic factors to investigate littering issues worldwide. From reviewing the literature, several studies have been evidencing a link between sociodemographic factors and littering. Accordingly, the factors of gender, age, level of education, were surveyed by Freije et al. (2019), Al-khatib et al. (2009); income level (Van Liere & Dunlap, 1980, Scott & Willits 1994); religious conviction (Biel & Nilsson, 2005; Hinds & Sparks, 2008); place of residence (Ajaegbo et al., 2012, Lewis et al., 2009, Larson et al., 2015; Arafat et al., 2007); marital status (Dupont, 2004; Chen et al., 2011); employment status (Witzke & Urfei, 2001; Veistein et al., 2004). Inversely, Cialdini et al. (1990) found no significant difference among gender or age groups related to littering. Finnie (1973) also found no link between littering and education; including those of Oguntayo et al. (2019), Opayemi et al. (2020) with other factors.

METHODOLOGY

Presentation of the setting

The survey occurred pretty well on the campus of the UY1. A higher academic institution situated at the heart of the political capital of Cameroon called Yaoundé since 1909. The UY1 is situated within Yaoundé III sub-division and precisely in a neighborhood called Ngoa - Ekellé. This University was born in 1961 just after the independence date of Cameroon (1960). Cameroon is a republic located in central Africa, between latitude 2 ° and 12° and between longitudes 8° and 16° (World Bank, 2002). The UY1 consists of an external unit, with three professional schools, including an internal unit from which our sample was constituted. This internal unit comprises four faculties namely: The Faculty of Arts Letters and Social Sciences (FALSH), the Faculty of Sciences (FS), the Faculty of Medicine and Biomedical Sciences (FMBS) and the Faculty of Education (FE). Within this unit are found three other schools belonging to the University of Yaoundé 2, whose students were also part of the sample. The UY1 is a bilingual institution, with English and French as academic languages.

Material and Procedure

Despite the scarcity of scales measuring littering attitude, the literature review helped to find one called the LAS (littering Attitude Scale) from Ojedokun (2015). The scale was built in 5 steps as followed:

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Step1: Item generation. Pools of items were built based on interviews, where several statements were generated by targeted participants. It permitted to get their thought and how they think and feel or act towards litter and littering, littered places and litterers. The interviews also aimed at ensuring that the items should be representative of the area of interest and content validity as well.

Step2: Item selection. Statements generated in step1 underwent content analysis, where the suitability of each item was selected based on its frequency in the pool of items. The minimal frequency recorded for selected items was 2 while the maximum was 25. The frequency was destined to determine the agreement among respondents on what they consider as litter and littering. A set of 28 items were selected from the statements.

Step3: Content and Validity with members checking. The selected items were reviewed by six interviewees for them to assess items relevancy and wording ambiguities. The questionnaire was designed via the “yes or no” format and taken back to the interviewees. Next, a first revision of the items was compiled by phrases reformation and separation of ambivalent items.

Step 4: Review of item pool by experts. Three experts in Social psychology and two in testing and test construction viewed the draft items. They assess relevance, language and measurement scales adopted. The experts ended up, reducing items to 24 as some were invalid for measuring attitude. All items were rated on a Likert scale ranging from strongly agree = 5 to strongly disagree = 1. Nine items were reversely scored to reduce response sets.

Step5: pilot testing. The retained items were pilot tested to check their suitability in order to judge the language, items relevance, clarity, and feasibility of items. In order to control the social reliability bias, the short form Marlowe-Crown 2(10) social reliability scale was added to the questionnaire. Two other experts in Linguistics translated the scale into Yoruba language and English language.

A cross-sectional survey design was used to administer the questionnaires to 200 individuals at three communities in Ibadan. After, the permission of respondents and description of the task, they were administered the questionnaire. They were tasked to give feedback about the clarity of the items and state any problem in completing the questionnaire. Data collection and analysis proved a convergent validity of the both versions of the questionnaire and the survey lasted 15 min with no incentive provided.

From DeVellis (2011), face and content validity were built. Also, the validity of the LAS items was examined using item-total analysis procedure outlined by Edwards (1957), as minimum content validity ratio (CVR) of 0.40 at $p < 0.05$ significance. This was the norm for retaining an item. All the 15 items were retained finally as the new LAS. The reliability of the LAS was assessed through Cronbach's Alpha of 0.85. To explore the scale dimension, the 24 items from the LAS were analyzed. Principal components extraction with an orthogonal rotation was employed using SPSS version 22.0. According to Tabachnick and Fidell (2007), two (2) factor loadings of .60 was considered and analyzed and revealed that the items had moderate communalities ranging from .257- .740. The mean item score was 3.48 with higher scores representing negative attitude towards littering.

Overall, the findings of the LAS showed a reliable instrument, with $\alpha = .87$ as internal consistency, a good construct, face and content validity. After all, the LAS needed to be tested by its builder, according to the rules of the methodological art.

First study with the LAS

The Internal Consistency and validity of the LAS were investigated in a cross-sectional survey of 1,360 males and females (18-65), urban residents in Oyo State by Ojedokun (2015). A multistage sampling technique was applied in the first study. A total of 2000 questionnaires were administered to consented participants. A total of 1520 were retrieved and 1360 selected for data analysis after screening. A confirmatory factor analysis (CFA) was performed using the structural equation modelling (SEM) estimation to evaluate the structural validity of the LAS.

Eventually, the LAS withstood the trial successfully, offering support for its reliability, analysis and construct validity. The findings of phase one and two indicated that the LAS had high levels of internal consistency and reliability. In terms of structural validity, findings of the CFA supported a one-factor structure of the scale. In conclusion, the LAS proved to be a Likert scale developed for the right measure of littering attitude, consisting of 24 items, though rigorous psychometric studies reduce it to 15 items finally, as mentioned by its designer. Overall, the 24 items of the LAS evidenced some good psychometric traits with Alpha = 0.87 as internal consistency, a good construct, face, and content validity, as mentioned by its designer.

Before the final usage of the LAS for our study, the scale was first of all adapted. Some words were modified among the 24 items of the LAS (e.g. in my community, public places were replaced by “on campus”, appropriate government agency switched to “appropriate University authority”). Then, twelve (12) sociodemographic determinants (age, sex, education level, faculty, education background, type of residence, place of residence, the region of origin, financial situation, marital status, employment status, religious affiliation) were attached to the scale from item 25th to 36th. From the literature review, these determinants are susceptible to explain littering attitude among the students of the UY1 (e.g. Al-Khatib et al., 2009; Arafat et al., 2007; Freije et al., 2019; Talooki & Jamaludin, 2019; Oguntayo et al., 2019, Samdhal & Robertson, 1989; Felonneau & Becker, 2008; Ajaegbo et al., 2012; Maleksaidi & Shafei, 2020). Concerning our study, the LAS was thus pilotested to 20 students with an acceptable reliability ($\alpha = 0.705$). After the pilot test, it was administered to 493 students from the internal unit of the UY1 still with a Likert 5 point scale (e.g., I believe littering is a negative habit; I think one should not bother about litter once it's not affecting one's life).

Data analysis

After data collection, and screening, they were treated via IBM-SPSS AMOS (22) and analyzed via a two-tailed Pearson correlation, Student t, and the ANOVA one-tailed testing. It is noteworthy that we recorded some reversed items, that undergone the technique of scores to find out the general score of attitudes. We use the t-test for single samples to compare mean score (2.5), the ANOVA according to the dimensions of sociodemographic determinants, and the Pearson correlation for testing the littering attitude-sociodemographic link.

RESULT AND DISCUSSION

After recoding the reversed items, the mean scores for all 24 items were calculated and compared to a hypothetical mean, the median of the scale, precisely 2.5. Table 1 presents both descriptive and inferential statistics for each item.

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Table 1
Descriptive and inferential statistics per item

Item	M	SD	t	df	p
1 I believe littering is a negative habit	4.08	1.38	25.23	489	.000
2 I think one should not bother about litter once it's not affecting one's life*	4.07	1.15	30.26	485	.000
3 Even though my surrounding is littered, I don't worry much about it *	4.11	.813	43.86	490	.000
4 When a bin is full, I will carry my litter to the nearest empty litter bin	4.07	1.10	31.33	483	.000
5 I believe litter does not hurt anyone *	4.19	1.14	32.88	488	.000
6 Litter is unsightly	3.49	1.49	14.62	481	.000
7 Seeing litter in drainages upset me personally	4.02	1.12	29.65	484	.000
8 Seeing someone littering upset me	4.02	1.10	30.42	484	.000
9 I am not comfortable in a littering surrounding	4.17	1.19	30.81	483	.000
10 I can participate in removing litter on campus	3.82	1.15	22.18	370	.000
11 In the absence of an empty litter bin nearby, it is ok to throw litter beside a full litter bin*	3.21	1.33	11.69	481	.000
12 I feel uncomfortable whenever I am in a littered surrounding	3.98	1.19	27.37	489	.000
13 When I see people littering, I feel angry about it	3.96	1.07	30.15	488	.000
14 Litter is only considering a problem when it hurts one's personal well-being *	3.57	1.35	17.35	484	.000
15 Any students caught in the act of littering must be punished	3.69	1.16	22.54	484	.000
16 I think time spend in removing litter on campus is wasted*	3.99	1.33	24.63	482	.000
17 Litter ruins the environment	4.03	1.27	26.58	487	.000
18 Litter is only considered a problem when it hurts the wellbeing of others *	3.58	1.38	17.03	469	.000
19 Throwing small items on the ground is not littering *	3.93	1.16	27.19	489	.000
20 If I have enough time or money, I would certainly devote some of it to the removal of litter on campus	3.56	1.07	21.85	484	.000
21 It is my responsibility to report to the appropriate authority of the campus any person seen littering	3.44	.98	20.97	485	.000
22 When I see people littering on campus, I will tell them that the areas of the campus are extension of personal homes that should not be littered	3.71	1.09	24.52	490	.000
23 When a litter bin is full, it is ok to throw waste on the ground near the litter bin*	3.53	1.31	17.14	477	.000
24 If anything; I must admit to a slight dislike of litterers *	2.48	1.10	-.313	470	.754

*Reverse item

In general, the averages are significantly above 2.5, which seems to indicate that the university students of the sample show a negative attitude towards unhealthiness, which is rather laudable for a healthy and hygienic environment. The total of all averages divided by the number of items confirms this trend. The littering attitude is indeed negative ($M = 3.826$; $SD = .453$; $p < .001$). The rest of the results will focus on the links with the various socio-demographic variables measured.

There is a significant positive relationship, though weak, between age and littering among the students of the UY1 ($r = .122$; $p = 0.042$). This signifies that as long as the age increases, littering attitude scores increase as well. Such a finding perfectly corroborates with those of Ojedokun and Balogun (2011). In their psycho-sociocultural analysis of attitude towards littering in a Nigeria urban city, they showed a link between age and littering attitude. Within the same vein, Ajaegbo, Dashi and Akume (2012) studied the determinants of littering attitude in urban neighbourhood of Jos. They found out a linkage between littering attitude and age as well. Freiji et al. (2019) also surveyed in the kingdom of Barhain in Singapore. They focused on the attitudes and opinions of people towards public littering. They also evidenced age to be influencing littering attitudes. Contrarily, those of Finnie (1973), Cialdini, Reno, and Kallgen (1990), Beck (2007), rather confirmed a no link between age and littering.

Next, no relation is found between sex and littering attitude ($t = -1.486$; $p = .138$) among the UY1 students. The study goes along with a part finding of Finnie (1973), Samdhal & Robertson (1989), Felonneau and Becker study (2008), Ajaegbo et al., (2012); Maleksaidi & Shafei (2020), who found a no sex difference as far as littering was concerned. Some studies contrarily rather demonstrated a link between sex and littering like those of Zero Waste Scotland, (2012); Mohai, (1992); Zelezny et al. (2000), and Opayemi et al. (2020). These

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studies indicated that females were more concerned with environmental issues than men right from younger age; due to cultural and socio-structural factors that make them on average more aware of the interconnections between causes and consequences of environmental harm (Stern et al., 1993; Hunter et al., 2004; Chen, 2011).

Results equally posits a no relation between littering attitude and level of education ($F_{(6, 278)} = 1.408$; $p = .211$). These findings accord with those of Santos (2005) who found unlearned people littering also as several studies confirmed that only learned people litter. However, the littering behavior of the lower and highly educated cannot be marked out distinctively different (Ajaegbo et al., 2012). This implies that the level of education is not linked to litter, as everybody litter one way or the other. Inversely, such a result goes against the investigation of Chen et al. (2011); Ojedokun & Balogun (2011). Besides, it goes the same with the variable of faculty (FALSH, FAS, FSE, FMSB, and IFORD, ESSTIC, etc.). Students from the faculty of medicine, department of geography for instance were supposed to be those sensitizing, raising more awareness about the dangers and protection of the campus environment. Unfortunately, it is the reverse, as any student is a litterer. That is why the result indicates no difference between belonging to a particular faculty and littering attitude among the UY1 students ($F_{(4, 279)} = 1.479$; $p = .209$). Education background though rarely studied refers to either a UY1 student went through a Francophone, Anglophone, or bilingual sub-system in one's secondary education. This is linked to the Cameroonian system of education, and susceptible to influence a student perception at the University that becomes bilingual (English and French). However, education background and littering attitude comes out to be unrelated as well among the UY1 students ($t = -1570$; $p = 0.118$).

No link was also found between the type of residence (on campus, out of campus) and littering attitude ($t = 0.696$, $p = .484$). It means that both students who dwell on campus and out of campus litter. Most students who live on campus are those falling short of enough finances to rent a room out of the campus. They struggle a lot for ends meet and are susceptible to care less for the environment. This supports studies portraying that low-income people litter more than the rich ones. It is in this sense that Van Liere & Dunlap (1980), Scott & Willits (1994) suggested a positive relationship between people's income and pro-environmental attitudes and behavior, because the environmental quality was often considered a luxury good for which people have more degree of freedom to emphasize when their material needs are satisfied. This point thus justifies the impossible link between income and littering attitude among students ($F_{(3, 277)}$; $p = .492$).

The residents where litter is perceived to be most abundant tend to be close to entertainment centers; in inner-city urban areas where there is a high density of population (Ajaegbo et al., 2012). The UY1 is one of the crowded University in Central Africa (more than 50000 students) justifies the recrudescence of littering on campus. To a certain extent, the residents in urban areas were more likely than those in the rural area to have dropped litter in the survey of Lewis et al. (2009). Descriptive statistics on the variable reported 482 respondents at a rate of 97.8%. Here, a higher rate of 84.8% referring to 418 students residing in urban areas, with only 64 at a rate of 13% leaving in rurality. This point also justifies the growing rate of littering at the UY1 campus because of its crowdedness. From the findings with the ANOVA test, no relationship was found between belonging to a given region (Centre, Littoral, West, South-West, Nord, Nord-West Far-Nord, South, Adamaoua, East) and littering attitude among the students of UY1 ($F_{(10, 275)} = 1.572$; $p = .115$). The Finding here collides not with a part study of Felonneau and Becker (2008). They show that environmental attitude and behavior are indeed caused by socio-cultural norms which are

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likely to vary according to cultures. Anyway, several studies showed that in Africa, girls at least are more pro-environmental as they are at early age trained to care for the environment (e.g., doing laundry, sweeping the yard, emptying litter bins). Unfortunately, it is the whole reverse with the students of the UY1, where boys and girls from any culture are all equal litterers.

This study also shows no relationship between littering and marital ($t = .1$; $p = .920$). It signifies that married students litter at an equal level with the unmarried ones. Such a finding disagrees with those of Al-khatib et al., (2009); Felonneau and Becker (2008) positing a link that widow/ers and married individuals litter less than single and divorced ones. Married people might be more concerned with local environmental problems than singles as the “parent effect” makes them seek their children’s future welfare (Dupont, 2004).

The t-test from the inferential analysis reveals no relationship between the employment status of the UY1 students (employed/ unemployed) and littering attitude ($t = .040$; $p = 0.969$). Therefore, both employed and unemployed students from the UY1 litter at an equal level. These findings still disagree with the one of Chen et al. (2011) study. They found employed respondents with higher odds of pro-environmental behavior than the unemployed ones. Veistein et al. (2004) showed that unemployed people present, occasionally, lower preferences for environmental protection policies.

Concerning Religious affiliation (Muslims, Christians, Atheist, and others), the inferential statistic with the ANOVA evidences no relationship between religious affiliation and littering attitude among the students of the UY1. ($F_{(4,278)} = 1.399$; $p = 0.235$). Very few studies have been performed on the investigation of such a link between littering and religious affiliation. Nevertheless, the studies of Biel and Nilsson (2005); Hinds and Sparks (2008); Al-khatib et al. (2009) contradict results here by indicating a (positive) relation between littering and religious conviction. Religiosity seems to affect the degree of rule-breaking and the social norm of compliance, but the case is quite different from the students of the UY1.

CONCLUSION

This study uses the Ojedokun scale (2015) constructed in Nigeria. We administered it in another context, but always in black Africa, especially in Cameroon. The scale there too is found to be valid, with regard to its psychometric properties. Littering attitude turns out to be unrelated to several socio-demographic variables. These results inspire new research aimed at a better understanding of the littering attitude base differences. If the university student is the population targeted in this study, repeating the research on other categories of individuals is also another issue to take into consideration. The concern is still to know how it is possible that individuals seem to disapprove unsanitary conditions since the environment in which they operate is daily littered with waste. Their waste management related behavior often contradicts their littering attitude, as shown by the pictures in the appendix.

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Conflict of Interest

The authors declared no conflict of interest as far as the publication of this paper is concerned.

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APPENDIX

Figure 1. Images of Litters on the Campus of the University of Yaoundé1



Note. Images of Litters on the Campus of the UY1. Taken on field work during survey from an ALCATEL phone-U3: SYC-A183-K500/K700-V310/3 (January 25, 2020).