Actual User Testing of E-Cigarette Age Gating Technology

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Abstract

A Smartphone-based technology has been developed that prohibits youth from using the product. The E-Cigarette is locked when purchased. The user is required to register the device to activate it. 163 subjects were enrolled in the study. Each subject was required to proceed through a series of activities to progress to the stage of activating the E-Cigarette. The first step required the subjects to download the application from the internet onto their smartphone. A total of 97% of the subjects completed this task. The next step was to create an account by providing a valid email address and password. A total of 96% of the subjects that were able to download the application were able to create an account. The next step was to verify the subject's age. None of the 16 – 17 or 18 – 20 years old individuals were able to age verify. All of the subjects under legal age, irrespective of race, gender, or ethnicity, were unable to age verify. That is, the system blocked 100% of the underage subjects from age-verifying and activating the E-Cigarette. Race, ethnicity, or sex did not impact the accuracy of the age verification process. For those of legal age (21+) who were unable to age-verify, there was no indication that the biometric scanning or liveness check function was impacted by race, ethnicity, or gender. This demonstrates that under the conditions of this test that the age-gating functionality is effective in preventing under legal age activation and use of the product.

The Product and Technology

The product is a pod based vaping system (PBVS). It is a rechargeable electronic nicotine delivery system (ENDS) device. **Figure 1** shows a picture of the Glas G2 product. The ENDS is enabled with technology designed to prevent underage use and also prevent re-use or use of counterfeit E-Liquid containing pods. The pods are available in tobacco, menthol, and non-descript flavors.

The technology used to age verify is not based on a single data point such as claimed age but is a combined collection of information about the user from the internet as well as facial recognition software designed to establish the age of the user. **Figure 2** is a schematic of how the age gated protected PBVS is intended to work with the smartphone application. The first step in the process is that the smartphone establishes that the user is over 21 years of age before the PBVS can be activated. Once legal age has been verified, a "certificate" is sent to the PBVS to allow it to be turned on and used. **During use, the PBVS re-activates as needed to assure that only the age verified consumer is using the system**. The PBVS cannot be purchased by one individual and used by another except in a short distance from the authorized smartphone. This **prevents an adult from purchasing the device and giving it to another individual who is not in close proximity to the authorized smartphone at all times**. Every flavor pod carries an imbedded certificate which prevents counterfeiting and reuse. **Figure 3** shows some of the smartphone connectivity features.

Figure 1. Glas G2 Device and Pod

Figure 3. Smartphone Connectivity Features

Figure 2. Age-Gating General Application Schematic

Methods

Participants from around the U.S. of differing sex and race, ranging in age from 16 to 50+ were recruited to participate in the study. Subjects were required to have a government issued ID. All subjects or their legal guardians were required to sign an informed consent form prior to being enrolled in the study. Key elements of the study were to test actual underage individuals and also to test individuals of differing race and ethnicity to make sure the application could adequately age verify. A total of 197 participants were recruited and 163 enrolled and completed the study. The subjects were required to perform a series of progressive actions related to ultimate activation and use of the device. Use of the device (ability to puff) was tested with a non-nicotine containing flavor pod. The series of actions were as follows:

- **Download the application onto their smartphone**
- **Create a user account on the sponsor website**
- **Age verify using government ID and selfie**
- **Activate the ENDS device**
- **Puff on the ENDS device**

Table 1 shows the demographic profile of the subjects. **Underage subjects in the 16-17 age group were differentiated from those in the 18-20 to determine if there was any age validation differences between young individuals (16 – 17) and those close to the legal age (18 – 20).** Approximately 20% of the subjects were Hispanic and 80% non-Hispanic. Caucasians, African Americans, Asian, and multiple/other were included in the study.

Table 1. Demographic Profile – Gender/Ethnicity/Race/User Group by Age Group

	Age Group					
	16-17	18-20	21-24	25-29	30-49	50+
Base: Total Respondents	**(n=15)**	**(n=28)**	**(n=23)**	**(n=27)**	**(n=53)**	**(n=17)**
Gender						
Male	33%	61%	35%	33%	43%	35%
Female	67%	39%	65%	67%	57%	65%
Ethnicity						
Hispanic	0%	25%	35%	30%	17%	6%
Non-Hispanic	100%	75%	65%	70%	83%	94%
Race						
Caucasian	47%	43%	26%	52%	51%	76%
African American	20%	7%	35%	26%	23%	18%
Asian	27%	32%	17%	11%	15%	0%
Multiple/Other	7%	18%	22%	11%	11%	6%
User Group						
Smoker	0%	4%	26%	41%	40%	47%
Vapor User	0%	18%	48%	33%	30%	18%
Other Tobacco/Nicotine User	0%	0%	4%	19%	19%	29%
Non-User	100%	79%	22%	7%	11%	6%

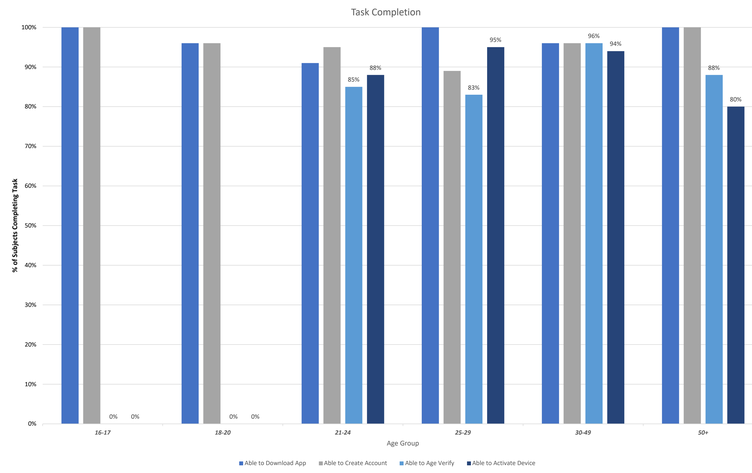
Results

Each subject was required to proceed through a series of activities to progress to the stage of activating the Device. The first step required the subjects to download the application from the internet onto their smartphone. A total of 97% of the subjects completed this task. The next step was to create an account by providing a valid email address and password. A total of 96% of the subjects that were able to download the application were able to create an account. The next step was to verify the subject's age.

None of the 16 – 17 or 18 – 20 years old individuals were able to age verify. A total of 90% of the legal age individuals were able to age verify. After age verification, the smartphone pairs with the Device activating it. 91% of the subjects were able to activate the device after pairing. **Figure4** shows the task completion by age group and task.

Results

Figure 4. Task Completion by Age Group



All of the subjects under legal age, irrespective of race, gender, or ethnicity, were unable to age verify. Race, ethnicity, or sex did not impact the accuracy of age verification process. **Table 2** shows the specific causes of the failure to age-verify. Three individuals were unable age verify because the software was unable to determine that an image of themselves (selfie) was substantially similar to the image on their government issued identification. All other failures were technical and included five individuals whose permanent address did not agree with the address on their ID or the address avail through internet searching. Two individuals could not get the application to work due to technical difficulties, such as the internet wasn't working. One individual was unable to take a selfie and one's driver's license would not scan.

Table 2. Reasons for Failing to Age-verify

	Age Group					
	16-17	18-20	21-24	25-29	30-49	50+
Base: Did Not Age Verify	**(n=15)**	**(n=27)**	**(n=3)**	**(n=4)**	**(n=3)**	**(n=2)**
Below Legal Age	15	27	0	0	0	0
Low Image Similarity	0	0	1	1	1	0
Incorrect Address	0	0	2	3	0	0
Technical Difficulties/ Internet Connectivity Issues	0	0	0	0	2	0
Unable to Take a Selfie	0	0	0	0	0	1
Horizontal Driver's License Would Not Scan	0	0	0	0	0	1

Conclusions

This study demonstrates that the age-gating technology that will be used with the Glas PBVS **effectively prevents under legal age individuals from activating and using the product**. The subjects just over the legal age (21 -24) experienced difficulties in age verification primarily because of their young appearance or using IDs that were not updated after they became of legal age.

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