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## Consistency Among Social Groups in Judging Emotions Across Time

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### Abstract

We measured judgments about emotions across time. In Study 1 ( $N = 254$ ) and Study 2 ( $N = 162$ ), LGBTQ-Latinx, Straight-Latinx, LGBTQ-White, and Straight-White emerging adults rated how they would feel if a perpetrator acted positively (P) or negatively (N) towards them in single, isolated events. In Study 2, participants also responded to a new *Emotions Across Time Task* where they judged how they would feel interacting with a hypothetical perpetrator across three timepoints: (1) an initial past event, (2) a recent past event, and (3) an uncertain future-oriented event (seeing the perpetrator again). Participants further predicted their thoughts and decisions in the uncertain future-oriented event. The past emotional events appeared in various sequences (PP, NN, NP, PN). Results indicated that participants judged events as unambiguous when occurring first in a sequence or in isolation (positive events feel better than negative events). In contrast, initial events shaped emotional reactions to subsequent events: Participants responded more intensely to episodes that were preceded by events of the same valence. In addition to this augmenting effect, initial negative events were especially sticky: Participants rated a positive event following a negative event as feeling less good than when a positive event appeared first or in isolation, but they judged negative events to feel equivalently bad regardless of order. When evaluating future-oriented affective states, participants drew from the prior experiences and prioritized the recent past (more positive emotions, thoughts, and decisions for PP > NP > PN > NN). Effects replicated across all social groups.

### Keywords

Future thinking; emotion understanding; social cognition; marginalized social groups; LGBTQ; Latinx

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Reactions to emotional events often seem unambiguous. For example, most people would judge that receiving a desirable gift feels good. Although this general, script-based

knowledge can get emotion-perceivers and emotion-experiencers quite far in predicting, explaining, and understanding emotions, it is important to also recognize that emotional episodes rarely occur in isolation. Rather, a variety of outside forces shape affective reactions to events. Returning to the prior example, imagine that the gift-giver had previously harmed you—does receiving the gift still feel as rewarding? In contrast, what if the gift-giver had previously done another generous act towards you, does receiving the current gift now feel more intensely positive? In the current research, we tested lay intuitions about the shaping power of the past on subsequent emotional responding. We created an *Emotions Across Time Task (EATT)* to assess whether adults expect prior life experiences to influence later affective responses to positive and negative events as well as to uncertain future-oriented situations. While our focus was on how adults (as a general group) think about emotions across time, we examined whether belonging to a marginalized social group is related to judgments about how past events influence present reactions to current and future-orientated situations, particularly in ambiguous social contexts (Inzlicht et al., 2009). Thus, we included groups who have historically been marginalized because of their sexual (i.e., people who self-identify as lesbian, gay, bisexual, transgender, and queer; LGBTQ<sup>1</sup>; Meyer, 1995, 2003) and/or ethnic identities (i.e., Latinx<sup>2</sup> people; Paradies, 2015).

When reasoning about emotions, adults exhibit awareness that emotions do not simply arise from features of a current situation. For example, adults believe that holding previously low expectations (versus high expectations) leads to more positive emotions after an outcome is known (Lara et al., 2019; Shepperd & McNulty, 2002). They also appreciate that thinking about how things could have been better leads to more negative feelings than if the alternative had not been considered; likewise, imagining how an outcome could have been worse improves emotional wellbeing (Atkinson et al., 2009; Payir & Guttentag, 2016; Roesse, 1997). More generally, adults understand that people's thoughts and interpretations of a situation can bias their affective responses (Kramer & Lagattuta, in press; Lagattuta, 2014; Lagattuta & Kramer, in press; Lagattuta et al., 2015). Here, we investigated beliefs about another potential emotion elicitor outside of the immediate situation. We assessed whether adults consider prior life experiences—the events that preceded the current situation—as viable influencers of how individuals will respond to present negative and positive events. Episodes following events of the opposite valence (i.e., a negative event occurring after a positive event; a positive event happening after a negative event) may feel less intense because they are colored by the initial experience. In contrast to this emotion dampening, emotional events of the same valence occurring in sequence could be augmented. That is, potentially, a second negative episode feels even worse than an initial negative event, whereas a subsequent positive event following an initial positive event could feel even more exhilarating.

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<sup>1</sup>Although sexual orientation and gender are considered distinct social constructs, these social group memberships are often grouped together under the coalition acronym of LGBTQ (lesbian, gay, bisexual, transgender or queer; Institute of Medicine, 2011). In this study, we use the term LGBTQ to be inclusive, while specifically focusing on sexual orientation and acknowledging distinct differences between these groups under the LGBTQ coalition term.

<sup>2</sup>The term Latinx transcends the male versus female, sex-gender binary that is inherent in the Spanish language to be inclusive of all sexually and gender diverse people of Latin American descent (Scharrón-del Río & Aja, 2015).

When considering how the past influences current emotional reactions, negative events may be stickier than positive events. Previous research indicates that people have a negativity bias in several domains (Baumeister et al., 2001; Vaish et al., 2008). For example, children and adults show a natural tendency to attend to negative information, even when directed to look only at positive stimuli (Lagattuta & Kramer, 2017; LoBue & DeLoache, 2008; Öhman et al., 2001). Children also exhibit more sophisticated reasoning about negative compared with positive emotions (Bamford & Lagattuta, 2012; Lagattuta & Wellman, 2001; Lagattuta & Wellman, 2002; Lagattuta et al., 1997; Lara et al., 2019). As well, when information is initially framed negatively (e.g., a new jobs program will lose 40% of jobs), adults' attitudes shift less once that information is subsequently reframed positively (e.g., that means that the new jobs program will save 60% of jobs) compared with when the order of frames is reversed (Boydston et al., 2018; Ledgerwood & Boydston, 2014; Sparks & Ledgerwood, 2018). Relatedly, adults require more evidence to judge that someone with negative traits (e.g., selfish, unfriendly) has developed positive traits (e.g., selfless, friendly) than it takes for them to believe the inverse progression (Klein & O'Brien, 2016; O'Brien & Klein, 2017). In the current study, we tested whether adults judge that negative past events bias reactions to subsequent positive events more strongly than do past positive events shape reactions to later negative episodes.

Although no prior work has assessed lay theories about the potential dampening or augmenting effects of prior events on a person's emotional response to a current outcome, researchers have tested children's and adults' beliefs about how prior life experiences bias affective responses to future-oriented situations. Lagattuta and Sayfan (2013) showed 4- to 10-year-olds and adults scenarios in which a perpetrator caused a focal child to feel negative or positive emotions on two occasions in varying orders: negative followed by negative (NN), positive followed by positive (PP), negative followed by positive (NP), and positive followed by negative (PN). In a final scene, the focal character sees the perpetrator again and participants judged the focal characters' thoughts (whether the character thought something good or bad would happen next), emotions (whether the character felt happy or worried), and decisions (whether the character would approach or avoid the perpetrator). Children and adults provided more positive emotion ratings, expected a higher likelihood of a positive future, and provided closer approach decisions for  $PP > NP > PN > NN$  pasts. The reliance on past event information, however, increased within childhood as well as between childhood and adulthood (see also Lagattuta, 2007; Lagattuta & Kramer, 2019; Lagattuta et al., 2018).

These distinctions among past types when predicting future-oriented mental states (i.e., more positive attributions for  $PP > NP > PN > NN$ ) reveal that participants across a wide age range believe that the past matters. What is less clear is how individuals incorporate and weight each prior episode. Lagattuta and Sayfan (2013) argued for a recency bias: Children and adults attributed more positive reactions following NP versus PN pasts, and they also visually attended to pictorial stimuli depicting the recent past more than the initial past (especially when the recent past was negative; assessed via eye tracking). In contrast, other work has shown that adults rely on initial information when forming impressions (Asch, 1946; Gawronski & Bodenhausen, 2006; Uleman & Kressel, 2013), suggesting that future reactions should be anchored to the first event. These perspectives may not be at odds. That

is, perhaps a primacy and recency bias jointly operate. Lagattuta and Sayfan (2013) told and showed participants how characters felt after each past event and had pre-matched the intensity of negative and positive events in NP and PN trials based on pilot participants' ratings for each event in isolation. It is possible that had participants actually evaluated characters' emotions after each event in sequence during the paradigm, they may have reasoned differently about how characters felt in the recent past and about the future. That is, as we conjectured above, participants may have expected characters' reactions to the second past episode to be biased by what had happened first (e.g., a positive event following a negative event is not as positive as that same positive event in isolation). Thus, we examined the extent to which adults incorporate both primacy and recency biases in their affective judgments about current events (a positive or negative event presently occurring) as well as when reasoning about future-oriented events (anticipating what will happen next).

## Present Research

We conducted two studies to assess emotional reactions to events across time. In Studies 1 and 2, adults rated how they would feel experiencing negative and positive events in isolation. In Study 2, we modified the past-to-future measure from Lagattuta and Sayfan (2013) to create an Emotions Across Time Task (EATT). Participants provided emotion ratings for each of the past events in the sequence prior to judging future-oriented reactions. This enabled us to test beliefs about (1) whether and how an *initial event* influences emotional reactions to a *recent (subsequent) event* (e.g., by comparing ratings to the same positive event when it appeared first versus second in a sequence; and, when second if preceded by a positive or negative initial event), as well as (2) whether and how two emotional past events bias emotions, thoughts, and decisions in an *uncertain future-oriented event* (i.e., seeing that same past perpetrator at a later time point). By having emotion ratings at all three time points (initial event, recent event, future-oriented event), we could further test which past event(s) adults relied on most (initial, recent, average emotion rating across the past event sequence) when reasoning about the future.

In the second experiment, we also address some additional critical questions that remain unanswered from Lagattuta and Sayfan (2013), especially with regard to the adult response patterns. In particular, because their task was primarily designed to address developmental changes in past-to-future reasoning, Lagattuta and Sayfan (2013) created a highly structured paradigm involving illustrations and narrations to aid in comprehension. Furthermore, all participants reasoned about child protagonists. Thus, adult reasoning could have been driven by them responding to how they believe children would think, feel, and make decisions in these situations, not how they think the past influences future-oriented responding more generally. Moreover, adults may also think differently if they are asked to consider their own, first-person reactions rather than reason about how other people will feel. Thus, in the current study we further tested whether adults' beliefs about how past experiences influence future-oriented affective reactions documented by Lagattuta and Sayfan (2013) would replicate when the task is stripped down to non-pictorial, first-person, adult-relevant incidents (i.e., PP > NP > PN > NN).

In both studies, we included representation of people from marginalized groups. We intentionally recruited individuals belonging to one or more marginalized social groups to examine how this status influences judgments about emotional reactions to events in isolation, events in sequence, and how past events influenced responses to ambiguous future-oriented events. Theoretical frameworks suggest that marginalized people have a more pronounced negativity bias when navigating ambiguous or threatening social contexts (Crocker et al., 1998; Goffman, 1963; Jones et al., 1984). This bias may aid in the detection of negative social events or threats that could be perceived as discrimination (Inzlicht et al., 2009). Studies show that LGBTQ and Latinx people anticipate future discriminatory experiences based on the intersection of their marginalized sexual and ethnic group memberships (Schein & Bauer, 2019). Yet, little is known about the on-line emotion cognition that may be associated with how LGBTQ, Latinx, and LGBTQ-Latinx people anticipate future events based on past experiences.

Because we recruited individuals with multiple marginalized social group memberships (e.g., LGBTQ-Latinx), we used an intercategorical quantitative application (McCall, 2005) of the intersectionality framework (Collins, 1991; Crenshaw, 1989) to inform the composition of our groups for analyses. For this reason, for analyses we grouped LGBTQ-Latinx, LGBTQ-White, Straight-Latinx, and Straight-White people into their own intersectional social groups (similar to Bauer & Schein, 2019; Schein & Bauer, 2019) to acknowledge: (1) that sexual orientation and ethnicity are tightly interwoven social constructs (Garnets, 2002); (2) that LGBTQ people of color's ethnic or racial backgrounds influence the meanings they ascribe to their sexual identities (DeBlaere et al., 2010); and (3) that people vary in their experiences and perceptions of negative events at various sexual and ethnic social group intersections (Bauer & Schein, 2019; Schein & Bauer, 2019). Thus, we made this analytical decision instead of adhering to a more traditional between-groups (2 X 2; sexual orientation x ethnicity) study design because using the standard approach is an oversimplified proxy for how the identities of people who belong to multiple marginalized social groups intersect (Cole, 2009; Crenshaw, 1989; Parent et al., 2013).

## Hypotheses

In Studies 1 and 2, we hypothesized that when in isolation, events we *a priori* determined to be positive would be rated more positively than those that we *a priori* determined to be negative. We expected that negative events would be rated as more intensely negative by marginalized social groups than by non-marginalized social groups. In Study 2, we predicted that adults would expect initial past negative and positive events to influence emotional reactions to subsequent negative and positive events, with initial negative episodes causing a stronger bias than initial positive episodes, particularly for marginalized social groups. We also anticipated that adults would provide more intensely positive emotions, thoughts, and decisions upon seeing agents of PP > NP > PN > NN pasts (conceptually replicating Lagattuta & Sayfan, 2013), and we explored whether these effects would be moderated by social group membership. To assess the assumption that adults rely most on the recent past when thinking about the future, we compared participants' future-oriented emotion ratings to the emotion ratings they provided for the initial past event, the recent past event, and their average emotion rating across the past event sequence.

## Study 1

### Method

Participants included two hundred and fifty-four<sup>3</sup> emerging adults between the ages of 18 and 29 years ( $M = 22.71$  years;  $SD = 3.26$ ) in four self-identified groups: LGBTQ-Latinx ( $n = 63$ ), Straight-Latinx ( $n = 66$ ), LGBTQ-White ( $n = 58$ ), and Straight-White ( $n = 67$ ). Our sample size was based on prior work on emotion cognition (Lagattuta & Sayfan, 2013). Participants were eligible if they were not incarcerated; identified as Latinx or White; identified as female, male, transgender, genderqueer, or gender non-conforming; could speak and comprehend English fluently; and if they were between 18 and 29 years of age. Participants were recruited through a university subject pool, social media, and through emails to listservs for LGBTQ and Latinx community and student groups (see Table S1 for additional demographics). All participants were entered in a raffle to win one of eight \$50 gift cards. Seventeen participants did not answer enough of the items to calculate the DVs, and were excluded from analyses (final  $N = 237$ ; 58 LGBTQ-Latinx, 65 Straight-Latinx, 52 LGBTQ-White, 62 Straight-White). This study was approved by the Institutional Review Board at University of California, Davis, #1122593-2.

**Events in Isolation**—Participants read 36 events in which a “perpetrator” hypothetically acted positively ( $n = 17$  events; e.g., “Someone praised you”) or negatively (e.g., “Someone rejected you”;  $n = 19$  events) towards the participant (Table S2). For each event, participants reported the valence of the event (7-point scale from very negative to very positive). Participants responded to the events in random order. These 36 events were informed by questionnaire items from scales that assess general daily hassles (Brantley et al., 2007), ethnic discrimination (Brondolo et al., 2005), and sexual discrimination (Rosario et al., 2002). To ensure that the final 36 events would be appropriate to use with all social groups (e.g., Scheim & Bauer, 2019), none of the episodes were specific to experiences related to sexual orientation or ethnicity, and none explicitly described the perpetrator’s actions as influenced by sexual orientation or ethnic social group membership.

We coded participants’ valence ratings on a 7-point scale:  $-3 =$  Very Negative;  $-2 =$  Medium Negative;  $-1 =$  A Little Negative;  $0 =$  Neutral (not negative or positive);  $1 =$  A Little Positive;  $2 =$  Medium Positive;  $3 =$  Very Positive. We averaged across event type for primary analyses to calculate an average emotion rating for positive events and an average emotion rating for negative events (see Table S2 for means and standard deviations by each individual event). During averaging, if participants were missing one or more items, we calculated their average out of the total number of events to which they did respond (e.g., if a participant only responded to 16 of the 19 negative events, then her average was calculated out of 16 rather than 19 events).

**General Procedure**—Participants first answered questions regarding their eligibility for the study. Next, eligible participants provided informed consent. We collected all data

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<sup>3</sup>A greater number of people ( $N = 270$ ) consented to being part of the study of which ( $n = 7$ ) did not complete any questionnaire data, ( $n = 4$ ) did not provide information about their sexual orientation, and ( $n = 5$ ) did not identify as Latinx or White. The cases pertaining to these respondents were not included in the analyses.

(including eligibility and consent) via Qualtrics Survey Software (Qualtrics, 2019). Prior to responding to the valence rating task, participants provided demographic information (including sexual orientation and ethnic group membership). Next, participants responded to the emotion valence rating measure. Within this measure, participants also reported how frequently each event had happened to them in the past, how often they expected each event to happen to them in the future, and how common they thought these events were in other people's lives. As well, participants reported the specific discrete emotion or emotions they expected to accompany each event (sad, mad, worried/scared, ashamed, disappointed, OK/neutral, happy, comforted, excited, proud, relieved). After completing the event ratings, participants reported on their general beliefs and emotional experiences. We describe these additional measures to be transparent in our reporting. These surveys and tasks, however, will be analyzed in separate manuscripts. At the end of the survey, we debriefed participants and they were invited to enter the raffle.

## Results and Discussion

Analyses were conducted in RStudio (RStudio Team, 2016). We set  $\alpha = .05$ .

**Events in Isolation Task (Table 1, Figure 1)**—We conducted a 4 (social group membership: LGBTQ-Latinx, Straight-Latinx, LGBTQ-White, Straight-White)<sup>4</sup> x 2 (valence: negative, positive) repeated measures analysis of variance (ANOVA) on valence ratings. This analysis resulted in a main effect for valence,  $F(1, 233) = 3829.97, p < .001, \eta_p^2 = .94$ , but no significant effects for social group membership,  $F_s < 1.85, p_s > .139, \eta_p^2_s < .02$ . As predicted, participants provided more intensely positive valence ratings following positive events than after negative events. Put more simply, participants rated positive events as about “Medium Positive” and negative events as approximately “Medium Negative.”

These data reveal that adults share consistent beliefs about emotional reactions to negative and positive events in isolation. Events that we assumed would be rated positively were rated more positively than events that we predicted would be rated negatively. A secondary goal of Study 1 was to assess whether there were any social group differences in how people reason about the impact of negative and positive events on their emotions. We found no significant group differences: Participants rated negative events as negatively and positive events as positively regardless of their social group membership.

## Study 2

The aim of Study 2 was to measure beliefs about how events from the past influence emotional reactions to current events (i.e., the participant imagines someone doing something bad or good to them after this person has already done something bad or good to them) and uncertain future-oriented events (i.e., the participant imagines seeing someone who has previously done good, bad, or both good and bad actions to them in the past). For example, do adults anticipate feeling more positively receiving a desirable gift from someone if that person had previously praised them versus called them a derogatory word? Furthermore, does seeing someone from the past feel better if that person previously rejected

<sup>4</sup>When we conducted analyses as a 2 (sexual orientation) x 2 (ethnicity) design, the same patterns emerged.



you and then later celebrated your accomplishments compared with if they first celebrated your accomplishments and then later rejected you? We again examined potential differences by social group membership. Although we found no evidence for group differences in Study 1, it is possible that when considering emotional events in sequence that group differences emerge. For example, perhaps initial negative events are stickier for marginalized groups (e.g., if someone has done something bad in the past, nothing can make up for such an event).

## Method

**Participants**—Participants included 162 adults: 45 LGBTQ-Latinx, 38 Straight-Latinx, 36 LGBTQ-White, and 43 Straight-White emerging adults between the ages of 20 and 31 years ( $M = 25.15$  years;  $SD = 2.60$ ). These data were collected at a third time point of a longitudinal study assessing the impact of discrimination on mental and physical health in sexually and ethnically diverse people over the course of two years.<sup>5</sup> Participants were recruited through social media, LGBTQ and Latinx community and student groups, as well as at Pride month events in Davis and Sacramento, California (see Table S3 for additional demographics). Six participants did not answer enough of the items to calculate the DVs, and were excluded from analyses (final  $N = 156$ ; 44 LGBTQ-Latinx, 35 Straight-Latinx, 36 LGBTQ-White, 41 Straight-White). Because Study 2 was part of longitudinal study, we excluded people from Study 1 who reported being part of this particular longitudinal study. This study was approved by the Institutional Review Board at University of California, Davis, #832712-14.

**Event Selection**—We used participants' ratings from Study 1 to select 8 negative and 8 positive items for use in Study 2 (see Table S4). All selected negative events had valence ratings between approximately "Medium Negative" and "Very Negative" ( $-2.43 < Ms < -1.82$ ;  $0.80 < SDs < 1.14$ ). All positive events had valence ratings between about "Medium Positive" and "Very Positive" ( $1.98 < Ms < 2.44$ ;  $.74 < SDs < 1.31$ ). On average, negative events were within 0.28 scale points of each other, positive events were within 0.22 scale points of each other, and positive events were within 0.24 scale points from negative events (in terms of intensity).

**Events in Isolation Task**—Participants reported how they would feel after 8 negative events (e.g., "One day, a person you have never met before *damaged your property*.") and 8 positive events (e.g., "One day, a person you have never met before *praised you*.") on a 6-point scale from Very Bad to Very Good. On each trial, participants were instructed to imagine someone new who they had never met before. The order of events was randomized. We coded participants' emotion ratings in isolation on a 6-point scale:  $-3 =$  Very Bad;  $-2 =$  Medium Bad;  $-1 =$  A Little Bad;  $1 =$  A Little Good;  $2 =$  Medium Good;  $3 =$  Very Good. For analyses, we averaged across the eight negative events to create one negative rating and the eight positive events to create one positive rating. We handled missing data in the same way as Study 1.

<sup>5</sup>In the parent longitudinal study, the sample sizes at first and second waves were ( $N = 202$ ; 51 LGBTQ-Latinx, 49 Straight-Latinx, 51 LGBTQ-White, and 51 Straight-White;  $M = 23.13$  years;  $SD = 2.59$ ) and ( $N = 171$ ; 45 LGBTQ-Latinx, 40 Straight-Latinx, 42 LGBTQ-White, and 44 Straight-White;  $M = 23.99$  years;  $SD = 2.57$ ), respectively.

**Emotions Across Time Task (EATT)**—Participants then responded to a series of two-event sequences. During the first event, the perpetrator did something negative (e.g., “One day, a person you have never met before *ignored your pleas for help*.”) or positive (e.g., “One day, a person you have never met before *tried to cheer you up*.”). The participant reported how they would feel using the same emotion scale described in the *events in isolation* task. Next, participants imagined this same person doing something negative (e.g., “A few days later, this same person *rejects you*.”) or positive (e.g., “A few days later, this same person *praises you*.”), and they reported how they would feel.

Participants then imagined seeing the same person again (e.g., “Remember, these two things happened to you. First, this person *rejected you*. A few days later, this person *praised you*. Many days later, you see this same person again.”). Participants reported how they would feel (using the same emotion scale), what they thought the person would do next (6-point scale: from “Definitely will do something bad” to “Definitely will do something good”), and what the participant would do next (6-point scale: “Really sure I would stay away from this person” to “Really sure I would go near this person”). Participants were also asked to explain why they would make the decision that they did. Consistent with previous work (Lagattuta & Kramer, 2019; Lagattuta & Sayfan, 2013), we reminded participants of both past events (initial and recent) immediately prior to asking them to report their emotions, thoughts, and decisions. This recap removed memory constraints and ensured that both episodes were made equally salient.

Participants responded to eight of these 2-event sequences in varying order: negative then negative (NN; two trials), positive then positive (PP; two trials), negative then positive (NP; two trials), and positive then negative (PN; two trials). For each sequence, participants were instructed to imagine someone new whom they had never met before. All of the events used in the *events in isolation* task, were also used in the events in sequence and past-to-future reasoning tasks. The task was programmed such that each of the events could be slotted in to any sequence (with the constraint that participants only saw each event once during the events in sequence and past-to-future reasoning task). Specific sequences and order of sequences were randomized.

We coded emotion ratings to each of the two events in sequence as well as to seeing the perpetrator again on a 6-point scale: -3 = Very bad; -2 = Medium bad; -1 = A little bad; 1 = A little good; 2 = Medium good; 3 = Very good. We coded thought ratings on a 6-point scale: -3 = Definitely will do something bad, -2 = Probably will do something bad, -1 = Might do something bad, 1 = Might do something good, 2 = Probably do something good, 3 = Definitely will do something good. We coded decision ratings on a 6-point scale: -3 = Really sure I would stay away from this person, -2 = Kind of sure I would stay away from this person, -1 = Not so sure I would stay away from this person, 1 = Not so sure I would go near this person, 2 = Kind of sure I would go near this person, 3 = Really sure I would go near this person. We averaged across the two trials from each past type. Missing data were dealt with the same way as Study 1.

**General Procedure**—We collected all data (including consent) via Qualtrics Survey Software (Qualtrics, 2019). Because this was a longitudinal study, eligibility was assessed

during the first wave of the study, and was not reassessed here. After providing consent, participants completed demographic information (including sexual orientation and ethnic group membership). Next, participants completed the events in isolation task followed by the EATT. After both tasks, participants were shown the emotional events one more time and they reported how frequently the events had happened to them in the past, how often they expected them to happen to them in the future, and how common these events were in other people's lives. Participants then completed mental health measures. These individual difference measures will be analyzed in separate manuscripts. Participants were debriefed and compensated with a \$25 gift-card for their time and efforts.

## Results

Results are presented in four sections. We first analyze beliefs about emotional events in isolation. Next, we analyze responses to the EATT, separating judgments for emotional reactions to positive and negative events occurring in varying sequences (PP, NP, PN, NN) and reasoning about the influence of past event sequences on future-oriented affective responses. Finally, we analyze how participants differentially weight prior events when thinking about the future. Analyses were conducted in RStudio (Rstudio, 2016). For all analyses, we set  $\alpha = .05$ , and we used Tukey's HSD to correct for multiple comparisons.

**Events in Isolation (Table 1, Figure 1)**—We conducted a 4 (social group membership) x 2 (valence) repeated measures ANOVA on average valence ratings. This analysis resulted in a main effect for valence,  $F(1, 152) = 4110.46, p < .001, \eta_p^2 = .96$ , and no effects for social group membership,  $F_s < 2.37, p_s > .073, \eta_p^2s < .04$ . As expected, and replicating Study 1, participants provided more intensely positive emotion ratings following positive events than after negative events. Indeed, similar to Study 1, participants reported that the positive events felt approximately “Medium Good” and negative events felt about “Medium Bad.”

**EATT: Emotions in Sequence (Table 1, Figure 2)**—We conducted a 4 (social group membership) x 4 (past: PP, NP, PN, NN) x 2 (event: initial, recent) repeated measures ANOVA on emotion ratings. This analysis yielded a main effect for past,  $F(3, 456) = 1611.68, p < .001, \eta_p^2 = .91$ , and event,  $F(1, 152) = 134.18, p < .001, \eta_p^2 = .47$ , qualified by a Past x Event interaction,  $F(9, 456) = 1153.66, p < .001, \eta_p^2 = .88$ . There were no effects for social group membership,  $F_s < 1.07, p_s > .387, \eta_p^2s < .02$ . As would be expected, initial events were treated equivalently to events in isolation.<sup>6</sup> That is, when evaluating how they would feel after initial events, participants rated the two negative events equivalently (the initial N in NN and NP;  $p > .999$ ) and the two positive events equivalently (the initial P in PP and PN;  $p > .999$ ). Furthermore, they reported that the two initial negative events would feel worse than the two initial positive events ( $p_s < .001$ ).

As predicted, emotions in response to the second event were biased by the initial event. A positive event preceded by a positive event (PP) was rated more positively than a positive

<sup>6</sup>When comparing the two initial negative events (NN, NP) to the negative event in isolation there were no effects for event,  $F_s < 1.26, p_s > .286, \eta_p^2s < .01$ . Similarly, when comparing the two initial positive events (PP, PN) to the positive event in isolation, there were no effects for event,  $F_s < 2.60, p_s > .076, \eta_p^2s < .02$ .

event that occurred first in a sequence (**PP**, **PN**,  $p < .035$ ). Moreover, a negative event preceded by a negative event (**NN**) was rated more negatively than when a negative event occurred first in a sequence (**NN**, **NP**,  $p < .001$ ). Consistent with the heightened stickiness of negative information over positive information, a positive event that came after a negative event (**NP**) was rated less positively than when it appeared first (**PP**, **PN**,  $p < .001$ ), but a negative event that followed a positive event (**PN**), was rated as negatively as an initial negative event (**NN**, **NP**,  $p > .996$ ).

**EATT: Past-to-Future Reasoning (Table 1, Figure 3).**—Three separate 4 (social group membership) x 4 (past) repeated measures ANOVA on (a) emotion intensity ratings, (b) thought likelihood ratings, and (c) decision certainty ratings all resulted in a main effect for past (emotion:  $F[3, 456] = 899.83$ ,  $p < .001$ ,  $\eta_p^2 = .86$ ; thought:  $F[3, 456] = 713.34$ ,  $p < .001$ ,  $\eta_p^2 = .82$ ; decision:  $F[3, 456] = 619.12$ ,  $p < .001$ ,  $\eta_p^2 = .80$ ), and no effects for social group membership (emotion:  $F_s < 1.56$ ,  $p > .201$ ,  $\eta_p^2 < .03$ ; thought:  $F_s < 1.13$ ,  $p > .339$ ,  $\eta_p^2 < .02$ ; decision:  $F_s < 0.41$ ,  $p > .812$ ,  $\eta_p^2 < .01$ ). Conceptually replicating and extending Lagattuta and Sayfan (2013), participants anticipated that a positive future felt better, was more likely, and made more confident approach decisions upon seeing a perpetrator of **PP** > **NP** > **PN** > **NN** pasts ( $p < .001$ ).

### Comparing Future-Oriented Emotions to Past Emotional Reactions (Table 2).

—We created difference scores between the emotion rating for the future-oriented event and the (1) initial past event (Event 1), (2) recent past event (Event 2), and (3) past average emotion rating (see Table 2 for means and standard deviations, including information about the direction of the difference). Using these scores, we compared participants' future-oriented reactions with their responses to the past events (contrasted with no difference; i.e., 0). Although participants clearly relied on the past when evaluating future-oriented emotions (see past-to-future reasoning analysis above), it was not the case that they expected past emotions to simply re-instantiate. That is, future-oriented emotion judgments differed from emotion ratings for initial events ( $l_t > 6.93$ ,  $p < .001$ ,  $d > 0.56$ ), recent events ( $l_t > 2.08$ ,  $p < .039$ ,  $d > 0.17^7$ ), and the average of the past events ( $l_t > 3.84$ ,  $p < .001$ ,  $d > 0.31$ ).

We then explored which past event(s) adults prioritized when reasoning about uncertain future-oriented events. We calculated Cohen's  $d$ s and the associated confidence intervals for each difference score (larger effects show a greater difference between past and future emotion ratings). We judged effect sizes as different from one another when a given effect size fell outside of the confidence interval of another effect size. As a strict test of the recency bias in mixed-valence pasts (**NP**, **PN**), we tested whether future-oriented emotion ratings most closely aligned with emotion ratings for the recent past event (as opposed to how they felt in the initial episode or on average across the two events). Patterns indicated a recency bias for **PN** trials (Initial:  $d = 2.80$ , 95% confidence interval [CI] [2.45, 3.14]; Recent:  $d = 0.67$ , CI [0.50, 0.84]; Past Average:  $d = 1.75$ , CI [1.50, 2.00]). For **NP** trials, however, future-oriented emotions most closely resembled the past average (Initial:  $d = 1.44$ , CI [1.21, 1.66]; Recent:  $d = 0.82$ , CI [0.64, 1.00]; Past Average:  $d = 0.43$ , CI [0.26, 0.59]).

<sup>7</sup>Except for **PP** trials,  $t[155] = 1.81$ ,  $p = .073$ ,  $d = 0.14$ .

To clarify whether these patterns were simply driven by the valence of the recent past, we also examined consistent-past trials (NN, PP). Adults were equally like to rely on the recent past as on the past average emotion rating when the perpetrator only acted negatively (NN; Initial:  $d = 0.56$ , CI [0.39, 0.72]; Recent:  $d = 0.17$ , CI [0.01, 0.32]; Past Average:  $d = 0.31$ , CI [0.15, 0.47]). Adults showed a recency bias when the perpetrator only behaved positively (PP; Initial:  $d = 0.56$ , CI [0.39, 0.73]; Recent:  $d = 0.14$ , CI [-0.01, 0.30]; Past Average:  $d = 0.45$ , CI [0.28, 0.61]). Thus, the interaction between valence and sequence determines how adults draw from past emotional events to inform their future-oriented emotions.

## General Discussion

Emerging adults who identified as LGBTQ-Latinx, Straight-Latinx, LGBTQ-White, or Straight-White judged that past emotional episodes shape affective reactions to events across time: Participants in all groups modified their emotional reactions to seemingly unambiguous positive and negative events based on the preceding event. This reliance on the initial past was stronger for negative compared to positive prior events. Although participants drew from the past when forecasting the future (more positive affective responses for PP > NP > PN > NN), future-oriented emotions differed from past emotional reactions, indicating that participants did not simply expect past emotions to reinstate. Signaling a recency bias, future-oriented emotions more closely aligned with emotion ratings from the recent versus initial past event. All findings were robust to sexual orientation and ethnic social group membership (the central results replicated in all four groups). Below, we integrate findings from the new Emotions Across Time Task (EATT) with related research and consider directions for future investigations.

## Judgments about Emotions Across Time

Adults consider information beyond the current event to infer their own and others' emotions, including beliefs, thoughts, and expectations (Atkinson et al., 2009; Lagattuta, 2014; Lagattuta et al., 2015; Lara et al., 2019; Shepperd & McNulty, 2002; Mrkva et al., 2019; Payir & Guttentag, 2016; Roese, 1997). We identified another factor that adults utilize when determining emotions: They expect the past to bias reactions to emotional events. In particular, adults judged that past positive events make subsequent positive events feel even *better* (PP) and past negative events make subsequent negative events feel even *worse* (NN). In addition to this augmenting effect, we documented a negativity bias when participants reasoned about events that differed in valence from the initial event to the subsequent (recent) event in sequence. Whereas initial (past) negative events greatly attenuated positive responses to recent (past) positive events (NP), initial (past) positive events had no influence on reactions to recent (past) negative events (PN). This contamination of negative experiences on subsequent positive events extends research showing that negative information is stickier and more difficult to overcome than positive information in impression formation, decision making, and attitude change (Bizer & Petty, 2005; Boydston et al., 2018; Klein & O'Brien, 2016; Ledgerwood & Boydston, 2014; O'Brien & Klein, 2017; Skowronski & Carlston, 1992; Sparks & Ledgerwood, 2018; Ferguson et al., 2019).

It is worth stressing that participants judged positive events as unambiguously positive and negative events as unambiguously negative when they were in isolation or occurred first in a sequence (i.e., across two studies they rated positive events as feeling medium good and negative events as feeling medium bad). These findings make their responses to a positive event that followed a negative event particularly compelling. For NP pasts, the average emotion rating for the positive event was weaker than “a little good” with 42% of participants endorsing a negative emotional reaction to this positive event. In contrast, only 4% of participants rated the negative event positively for a PN trial. Adults may have viewed perpetrators’ negative prior behaviors as more intentional and diagnostic of character than their more socially normative positive actions (Knobe, 2003; Skowronski & Carlston, 1989)—making negative events feel unequivocally negative, but positive events as more up to interpretation depending upon the preceding circumstances (Cone & Ferguson, 2015; Ferguson et al., 2019). Thus, when adults imagined experiencing the positive event in the NP trial, they may have questioned whether the positive event was still definitively rewarding. For example, if someone made fun of you, but then helped you, you may interpret the helping to indicate the person deems you incompetent. In contrast, if instead this person helped you and then later made fun of you, being ridiculed still feels bad.

### **Relying on the Past when Thinking about the Future**

Research crossing a wide range of topics including economics, politics, business, and health indicate that people look to the past to forecast the future (Karinol & Ross, 1996; Malmendier & Nagel, 2011; Sönmez & Graefe, 1998; Suddendorf & Corballis, 2007; Ward et al., 2013). Not surprisingly, then, participants relied on prior emotional episodes when reasoning about their affective reactions to uncertain future-oriented events. Conceptually replicating Lagattuta and Sayfan (2013), participants judged that they would feel more intensely positive, think more optimistically, and make more confident approach decisions re-encountering the instigator of PP > NP > PN > NN pasts. The design of the current study afforded the opportunity to explore additional aspects of how adults integrate past events when thinking about the future. We tested whether future-oriented emotional reactions were simply a reinstatement of one or both prior emotional reactions. This was not the case. Instead, while future-oriented emotion judgments shared similarity with past emotions, they were not equivalent (e.g., in PN trials, participants rated their future-oriented emotion more negatively than their response to the initial past event, more positively than their response to the recent past event, and more negatively than the average of the past two events). These data suggest that there is something unique about future forecasting that cannot be fully captured in past experiences. One candidate for the cause of these differences is that adults may try to account for the uncertainty of the future (e.g., Lagattuta & Sayfan, 2011). For example, even when the perpetrator previously behaved consistently negatively, some participants left open the possibility that the past does not constrain the future. Additional work using computational modeling to test more precisely how participants think about the future based on the past (e.g., including an indicator of uncertainty) would be informative (e.g., Ong et al., 2019).

Our results further reveal which past event participants prioritize when considering the future. Although adults weighted recent events more than initial events, the findings did not

provide unwavering support for an exclusive recency heuristic. For NP trials, the average emotion rating of the two past events more closely approximated future-oriented emotion judgments than the recent event alone. Moreover, whereas in Lagattuta and Sayfan (2013) participants expected future-oriented emotions to align with the most recent past (e.g., feel positive after NP past, feel negative after PN past), adults in our study reported that they would feel closer to neutral seeing the NP perpetrator (but still feel bad seeing the PN perpetrator). In Lagattuta and Sayfan (2013), participants were told how the character felt after each past event and only predicted their future-oriented reactions. This may have suggested that the character had “moved on” and did not let the first episode permeate how they reacted to subsequent events. The current paradigm provided a stricter test of the recency bias because participants rated emotions for each past event—permitting them to carry the initial emotional event through time. That they pushed forward negative initial events but not positive initial events speaks to the salience and temporal stickiness of negative emotional information (Baumeister et al., 2001; Lagattuta & Kramer, 2017; Ledgerwood & Boydstun, 2014; Vaish et al., 2008).

### Social Group Membership and Emotion Cognition

Social group membership did not moderate judgments about emotional responses to events in isolation, events in sequence, or future-oriented events. Thus, in contrast to our hypotheses and prior research (Crocker et al., 1998; Inzlicht et al., 2009), we did not find any evidence that a general negativity bias was stronger in the marginalized social groups that we tested (i.e., LGBTQ-Latinx, LGBTQ-White, and Straight-Latinx people) than in the non-marginalized social group (i.e., Straight-White individuals). Given that past work demonstrates that members of marginalized groups experience more instances of discrimination (e.g., Bauer & Scheim, 2019; Paradies et al., 2015), the current findings suggest that, at the group level, these experiences do not necessarily shape people’s perceptions of or expectations about interpersonal situations that are not explicitly related to their social group status. Importantly, then, these results argue against a “victimhood mentality” that is sometimes attributed to members of marginalized groups by people with privilege and power (Dwyer, 2014; Marshall, 2010; Talburt, 2004). Rather, individuals from marginalized social groups have emotional and social cognitive processes that are (at least) as nuanced and balanced as those from majority groups. Therefore, the tasks in the current research appear to be equally applicable across diverse social groups, speaking to their potential utility for other researchers interested in assessing emotion cognition.

Bridging to research on intercategorical intersectionality can inform extensions of the EATT. For example, Scheim and Bauer (2019) found that LGBTQ people of color anticipated negative events more often than Straight-White participants after participants were instructed to think about their social identities (e.g., skin color, ancestry, gender, sexuality). In that research, however, participants were told to envision their identity as the cause of the negative event (e.g., “*Because of who I am, people might try to attack me physically*”). Thus, combining the EATT with the approach of Scheim and Bauer (2019) might elucidate the specific contexts where social group differences in negativity biases emerge. Recall that in the current work, participants in Study 1 reported demographic information (including sexual orientation and ethnic identity) immediately prior to answering questions about how

they would emotionally react to events. Participants in Study 2 also knew that they were part of a larger longitudinal study aimed to measure psychosocial stressors related to social group identity. Despite this potential priming of social identities (DeMarree et al., 2005; Gaither et al., 2013), there were no group differences in responses to events in isolation or on the EATT. Thus, we anticipate that social identity priming needs to be robust and linked to the cause of an event for groups to differ in their responses.

Alternatively, it is possible that participants purposely reported the emotion, thought, and decision judgments that they thought conformed to some population-wide average, rather than to their personal experiences and perspectives. We find this interpretation implausible for two reasons. First, it would have required participants to estimate accurately how people from other social groups would respond to each event, and then systematically adjust their ratings across multiple trials to fit those anticipated answers; an incredible perspective-taking feat. Moreover, participants in Study 1 and Study 2 gave equivalent responses despite only the latter group being part of the longitudinal study. Although we did not document group-level differences, there was clear *within* group variability on the EATT, especially for NP trials (e.g., some individuals anticipated feeling negatively during the recent positive event and/or the future-oriented emotion whereas others provided positive emotion ratings; see Figures 2 and 3). To understand these individual differences, in future work we will analyze relations among participants' EATT responses, their personal experiences with discrimination, and mental health (Bauer & Scheim, 2019; Parra & Hastings, 2020; Scheim & Bauer, 2019).

### Limitations and Future Directions

When thinking about how the past influences reactions to future-oriented events, adults attributed similar emotional responses to themselves (current research) and to others (Lagattuta & Sayfan, 2013). This corresponds with research suggesting that biases in affective forecasting influence people's beliefs about self and other emotions in similar ways (O'Brien et al., 2018). Other work, however, suggests that thinking about one's own and others' reactions can lead to differing judgments (Ong et al., 2018). Research systematically examining when emotional perspective taking in the first- versus third-person converges or diverges would be interesting. More broadly, the importance of replication should not be overlooked. With the rising concern that several key findings in psychological research are not replicable (Open Science Collaboration, 2015), it is noteworthy that this is the second successful conceptual replication of how adults integrate past emotional episodes when reasoning about future-oriented affective states (i.e., PP > NP > PN > NN pasts; see also Lagattuta & Kramer, 2019). Of course, independent replications outside of our lab would be critical. The creation of this online version of EATT will aid in this goal, as it will be easier to share these materials with other researchers. Indeed, the EATT could be modified to address additional questions about complex emotion cognition. For example, it would be informative to test whether varying the temporal spacing of the initial and recent events (e.g., days, weeks, years) impacts judgments, and to examine how participants respond to longer sequences of past events. As well, examining whether responses to the EATT vary depending upon a participant's relationship to the perpetrator (e.g., stranger, parent, friend) would be an important focus for future studies.



In Lagattuta and Sayfan (2013), children as young 4 to 5 years recognized the biasing impact of past emotional events on how a person would feel, think, and make decisions seeing that perpetrator again. It remains unclear, however, at what age children appreciate that past experiences can also influence emotional reactions to seemingly unequivocal negative and positive events. Moreover, because young children (especially those under 6 years of age), tend to have high confidence when predicting the future (Lagattuta & Sayfan, 2011), it is possible that the correspondence between their future-oriented reactions and past emotional reactions would be more similar than they are for adults because children leave less room for uncertainty. It is further unknown whether young children would reason about story characters the same way as they reason about themselves (as did the adults in the current research). Future studies are needed that incorporate a developmental perspective by testing children's and adults' responses to the EATT (or more simplified versions of the EATT) across a wide age range.

Our goal was to assess adults' beliefs about emotions across time, but these intuitions may not correspond to the ground truth of their actual emotional reactions. Adults often struggle to accurately infer how they will feel at later points in time: They overestimate the type, intensity, and duration of their affective reactions (Kramer et al., 2017; Kramer & Lagattuta, 2018; Meyvis et al. 2010; Wilson & Gilbert, 2003). Thus, it is possible that the effect of past experiences on subsequent reactions to negative, positive, and uncertain future events would be weaker or more nuanced than participants reported. Moreover, we made the past events salient by asking participants to rate their emotional reactions after each event and reminding them about the two events before they provided their future-oriented responses. This scaffolded context may have artificially highlighted the valence consistency (or inconsistency) of the sequenced events. It would be interesting to explore the extent to which people spontaneously reflect on their emotions after an event as well as their accuracy at tracking the sequence of negative and positive events in their everyday lives. Indeed, although we found no social group differences in adults' judgments about emotions across time, this does not preclude the possibility that differences could emerge in their first-person experiences in the lab or in real life.

## Conclusions

Adults share strong consensus about emotional events in isolation: They judge that negative events feel bad and positive events feel good. Still, they also appreciate that emotional reactions are not always linearly and directly derived from the present circumstances. Instead, they reason that emotions carry forward in time to influence how they later respond to seemingly unambiguous positive and negative events as well as to uncertain future-oriented events, with prior negative episodes being especially sticky. Although there was variability in the extent to which adults expected initial events to contaminate subsequent reactions, emotional ratings to events in isolation and on the EATT replicated at the group level in LGBTQ-Latinx, Straight-Latinx, LGBTQ-White, and Straight-White emerging adults. The current methods and data lay a foundation for new empirical questions for the study of emotion. Focally, they indicate that affective scientists need to attend not only to the "objective" features of emotional events when designing procedures, but also

consider the complex reality that individuals rarely experience events in isolation; rather, we build our emotional responses across time.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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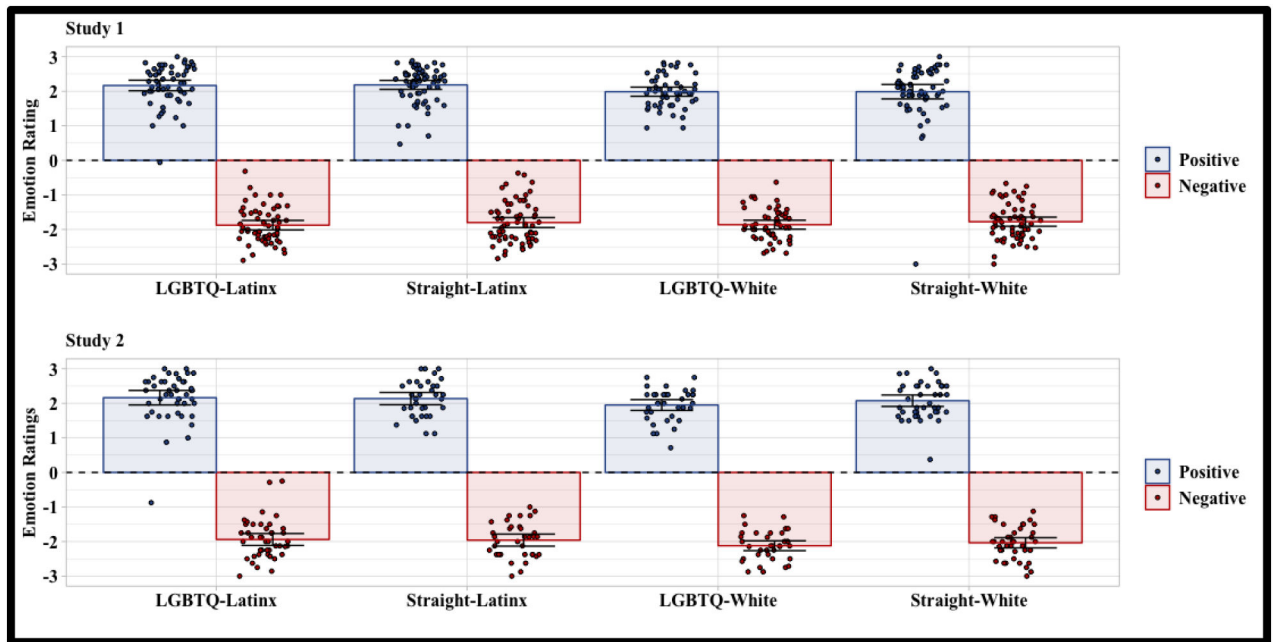
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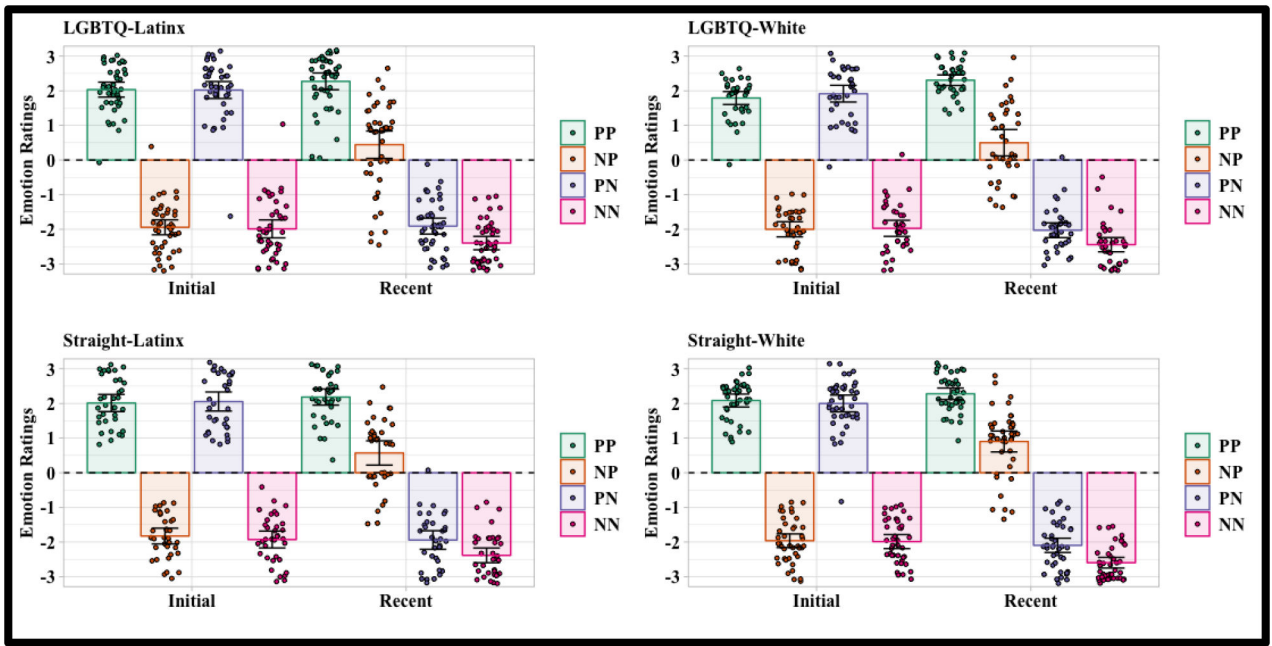
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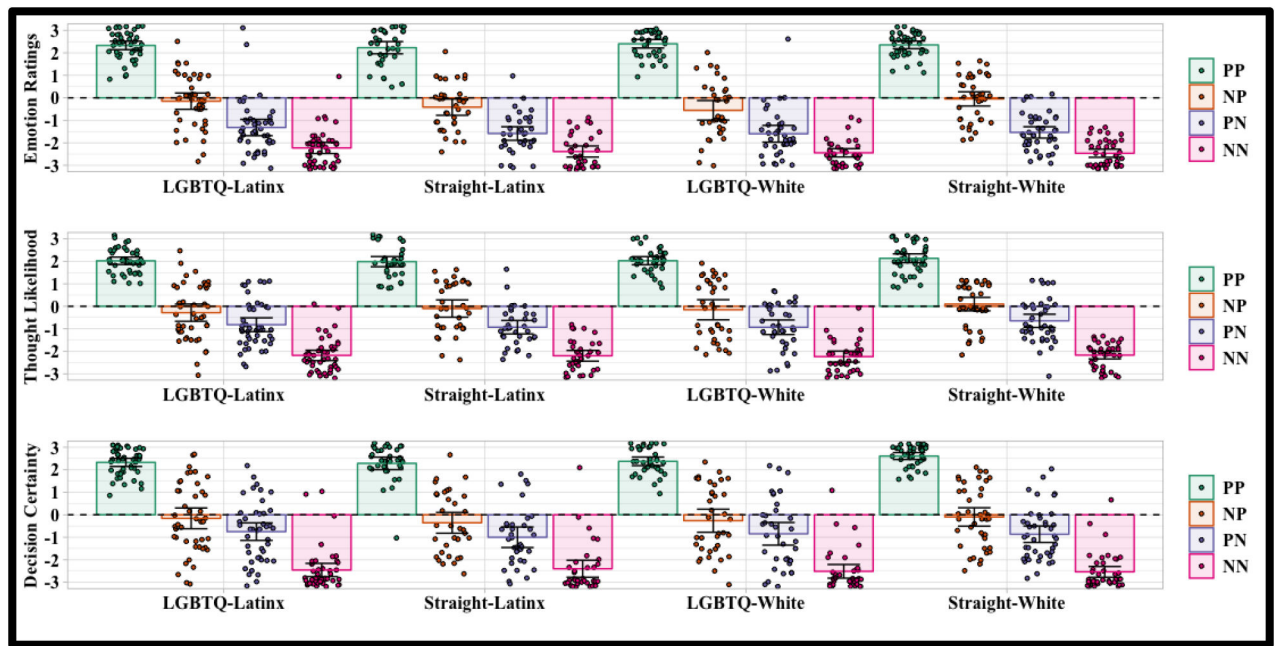


**Figure 1.** Events in isolation ratings by study, group, and valence. Bar = Mean; Error bar = 95% CI; small circle = jittered individual data.



**Figure 2.** Events in sequence ratings by group, past, and event. PP = Positive then Positive; NP = Negative then Positive; PN = Positive then Negative; NN = Negative then Negative. “Initial” = emotion rating for first event in the sequence; “Recent” = emotion rating for second event in the sequence. Bar = Mean; Error bar = 95% CI; small circle = jittered individual data.





**Figure 3.** Past-to-future ratings by judgment, group, and past. PP = Positive then Positive; NP = Negative then Positive; PN = Positive then Negative; NN = Negative then Negative. Bar = Mean; Error bar = 95% CI; small circle = jittered individual data.

**Table 1.**

Study 1 and Study 2: Means and Standard Deviations for Events in Isolation (Emotion Ratings), Events in Sequence (Emotion Ratings), and Past-to-Future Judgments by Social Group Membership.

	LGBTQ-Latinx	Straight-Latinx	LGBTQ-White	Straight-White	All Participants
<b>Study 1</b>					
<b>Events in Isolation</b>					
Positive (P)	2.17 (0.58)	2.18 (0.52)	1.99 (0.47)	1.99 (0.82)	2.09 (0.62)
Negative (N)	-1.88 (0.52)	-1.80 (0.58)	-1.86 (0.46)	-1.77 (0.52)	-1.83 (0.53)
<b>Study 2</b>					
<b>Events in Isolation</b>					
Positive (P)	2.16 (0.69)	2.14 (0.52)	1.95 (0.47)	2.08 (0.52)	2.09 (0.56)
Negative (N)	-1.94 (0.57)	-1.96 (0.51)	-2.12 (0.42)	-2.04 (0.47)	-2.01 (0.50)
<b>Events in Sequence</b>					
PP Initial (P)	2.03 (0.71)	2.01 (0.72)	1.79 (0.55)	2.09 (0.59)	1.99 (0.65)
PP Recent (P)	2.27 (0.80)	2.19 (0.68)	2.31 (0.45)	2.28 (0.52)	2.26 (0.63)
PN Initial (P)	2.02 (0.81)	2.06 (0.80)	1.92 (0.71)	2.00 (0.77)	2.00 (0.77)
NP Recent (P)	0.44 (1.30)	0.57 (1.02)	0.50 (1.13)	0.90 (0.96)	0.61 (1.12)
NN Initial (N)	-1.99 (0.85)	-1.93 (0.71)	-1.97 (0.69)	-1.99 (0.64)	-1.97 (0.72)
NN Recent (N)	-2.40 (0.63)	-2.39 (0.62)	-2.44 (0.61)	-2.60 (0.49)	-2.46 (0.59)
NP Initial (N)	-1.94 (0.71)	-1.83 (0.66)	-2.00 (0.64)	-1.96 (0.63)	-1.94 (0.66)
PN Recent (N)	-1.91 (0.76)	-1.94 (0.78)	-2.03 (0.63)	-2.09 (0.65)	-1.99 (0.71)
<b>Past-to-Future</b>					
PP Emotion	2.33 (0.62)	2.23 (0.79)	2.40 (0.56)	2.35 (0.54)	2.33 (0.63)
NP Emotion	-0.15 (1.19)	-0.41 (1.05)	-0.56 (1.29)	-0.05 (1.00)	-0.28 (1.14)
PN Emotion	-1.32 (1.20)	-1.59 (0.88)	-1.60 (1.10)	-1.54 (0.80)	-1.50 (1.01)
NN Emotion	-2.23 (0.81)	-2.39 (0.72)	-2.44 (0.54)	-2.46 (0.57)	-2.38 (0.68)
PP Thought	2.02 (0.54)	1.99 (0.66)	2.03 (0.53)	2.13 (0.62)	2.04 (0.59)
NP Thought	-0.28 (1.26)	-0.10 (1.12)	-0.15 (1.32)	0.10 (0.94)	-0.11 (1.16)
PN Thought	-0.82 (1.01)	-0.93 (0.67)	-0.93 (0.96)	-0.65 (0.93)	-0.82 (0.94)
NN Thought	-2.18 (0.76)	-2.20 (0.70)	-2.24 (0.72)	-2.17 (0.53)	-2.20 (0.68)
PP Decision	2.33 (0.59)	2.29 (0.81)	2.38 (0.57)	2.61 (0.48)	2.40 (0.62)
NP Decision	-0.16 (1.52)	-0.36 (1.35)	-0.26 (1.51)	-0.10 (1.30)	-0.21 (1.41)
PN Decision	-0.75 (1.28)	-1.00 (1.33)	-0.85 (1.49)	-0.87 (1.16)	-0.86 (1.30)
NN Decision	-2.45 (0.96)	-2.40 (1.10)	-2.51 (0.90)	-2.54 (0.76)	-2.48 (0.93)

*Note.* Valence ratings for Study 1: 3 = very negative; 2 = medium negative; 1 = a little negative; 0 = neutral (not negative or positive); 1 = a little positive; 2 = medium positive; 3 = very positive; valence ratings for Study 2: 3 = very bad; 2 = medium bad; 1 = a little bad; 1 = a little good; 2 = medium good; 3 = very good. LGBTQ = Lesbian, Gay, Bisexual, Transgender, or Queer; PP = positive then positive; NP = negative then positive; PN = positive then negative; NN = negative then negative. "Initial" = emotion rating for first event in the sequence; "Recent" = emotion rating for second event in the sequence.

**Table 2.**

Study 2: Means and Standard Deviations for the Difference Between Future Emotion Ratings and Emotion Ratings to Event 1, Event 2, and the Average of Event and Event 2 by Social Group Membership

	LGBTQ-Latinx	Straight-Latinx	LGBTQ-White	Straight-White	All Participants
<b>Weighting the Past When Forecasting the Future</b>					
PP Future – Initial	0.30 (0.53)	0.21 (0.74)	0.61 (0.66)	0.27 (0.45)	0.34 (0.61)
PP Future – Recent	0.06 (0.55)	0.04 (0.51)	0.10 (0.48)	0.07 (0.31)	0.07 (0.47)
PP Future – Past	0.18 (0.47)	0.13 (0.52)	0.35 (0.50)	0.17 (0.28)	0.21 (0.45)
NP Future – Initial	1.80 (1.15)	1.41 (1.07)	1.44 (1.23)	1.91 (1.12)	1.66 (1.15)
NP Future – Recent	-0.59 (0.77)	-0.99 (1.25)	-1.06 (1.26)	-0.95 (1.01)	-0.88 (1.08)
NP Future – Past	0.60 (0.75)	0.21 (0.98)	0.19 (1.02)	0.48 (0.88)	0.39 (0.91)
PN Future – Initial	-3.34 (1.39)	-3.64 (1.32)	-3.51 (1.16)	-3.54 (1.13)	-3.50 (1.25)
PN Future – Recent	0.59 (0.82)	0.36 (0.67)	0.43 (0.78)	0.56 (0.65)	0.49 (0.74)
PN Future – Past	-1.38 (1.00)	-1.64 (0.78)	-1.54 (0.86)	-1.49 (0.75)	-1.50 (0.86)
NN Future – Initial	-0.24 (0.87)	-0.46 (0.62)	-0.47 (0.76)	-0.48 (0.61)	-0.40 (0.73)
NN Future – Recent	0.17 (0.66)	0.00 (0.42)	0.00 (0.41)	0.13 (0.42)	0.08 (0.50)
NN Future – Past	-0.03 (0.69)	-0.23 (0.40)	-0.24 (0.50)	-0.17 (0.40)	-0.16 (0.52)

Positive scores indicate that the future is more positive than the past; negative scores indicate that the future is more negative than the past; scores no different from 0 indicate that the past and present are equivalent. LGBTQ Lesbian, Gay, Bisexual, Transgender, or Queer; PP = positive then positive; NP = negative then positive; PN = positive then negative; NN = negative then negative. “Initial” = emotion rating for first event in the sequence; “Recent” = emotion rating for second event in the sequence; “Past” = (emotion rating for initial event + emotion rating for recent event) / 2.